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# Capital Improvement Plan 2019 - 2023

Version 2.0 | January 31, 2018

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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:

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*"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."*

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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:

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

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

- *Abe Munfakh, P.E.*
- *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*
- *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 four 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.

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*"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"*

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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 fiscal year 2019 through fiscal year 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 three projects in the Water category and seven 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								
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main	\$0	\$460	\$570	\$1,797	\$2,644	\$895	\$23,087	\$45,825	\$57,389	\$74,248	\$132,667
122003	Waterworks Park WTP to Northeast WTP Transmission Main	0	19	1,305	1,372	8,622	17,547	46,022	30,722	25270	104,285	130,879
115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	0	9	412	968	20,771	34,466	14,397	28	0	70,630	71,051

#### 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								
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total
260200	Sewer and Interceptor Rehabilitation Program	\$0	\$3,397	\$7,751	\$10,601	\$10,400	\$11,400	\$11,400	\$11,400	\$11,400	\$55,201	\$77,749
222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	0	5	2,232	1,084	8,052	10,187	10,187	10,187	2491	39,697	44,425
260500	CSO Outfall Rehabilitation	0	0	0	507	3,826	10,001	10,001	10,001	10001	34,336	44,337
260600	CSO Facilities Improvement Program	0	764	1,658	9,277	6,218	2,351	4,351	9,351	11251	31,548	45,221
211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery	14	10,229	12,983	16,107	8,671	6,033	0	0	0	30,811	54,037

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures								
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total
<b>232001</b>	Fairview Pumping Station - Replace Four Sanitary Pumps	0	778	508	12,094	14,414	3,974	0	0	0	30,482	31,768
<b>216006</b>	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station	0	0	0	0	1,718	4,008	7,174	17,530	24,026	30,430	54,456

## SECTION 4 LARGEST 2019 PROJECTED SPEND (GREATER THAN \$5M)

The water and wastewater projects with the largest projected spend for 2019 are listed below. These projects are budgeted for greater than \$5 Million in FY 2019. There is one project in the Water category and seven projects in the Wastewater category.

### 4.1. Water

**Table I-3. Water Projects with 2019 Projected Spend Greater than \$5M**

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures								
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total
<b>116002</b>	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	\$0	\$10	\$3,625	\$9,042	\$5,468	\$5,468	\$5,468	\$3,998	\$0	\$29,444	\$33,079

## 4.2. Wastewater

**Table I-4. Wastewater Projects with 2019 Projected Spend Greater than \$5M**

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures								
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total
<b>260200</b>	Sewer and Interceptor Rehabilitation Program	\$0	\$3,397	\$7,751	\$10,601	\$10,400	\$11,400	\$11,400	\$11,400	\$11,400	\$55,201	\$77,749
<b>260600</b>	CSO Facilities Improvement Program	0	764	1,658	9,277	6,218	2,351	4,351	9,351	11,251	31,548	45,221
<b>211001</b>	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery	14	10,229	12,983	16,107	8,671	6,033	0	0	0	30,811	54,037
<b>232001</b>	Fairview Pumping Station - Replace Four Sanitary Pumps	0	778	508	12,094	14,414	3,974	0	0	0	30,482	31,768
<b>213007</b>	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	0	0	567	6,787	11,356	3,477	0	0	0	21,620	22,187
<b>212006</b>	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	912	5961	20,619	15,817	4,157	0	0	0	0	19,974	47,466
<b>213002</b>	WRRF Rehabilitation of Central Offload Facility	0	202	665	6,447	7,520	4,579	0	0	0	18,546	19,413



## 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. 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 for planning purposes. It reflects the past actual dates as well as projected future dates and is subject to change. 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
<b>October 2017</b>	Review Committee Meetings
<b>October 12, 2017</b>	Executive Leadership Team Reviews BCE's & Modifications to CIP
<b>October 24, 2017</b>	Introduce New BCE's & Major CIP Modifications to AM/CIP Customer Outreach Work Group
<b>November 2017</b>	Executive Leadership Team Reviews BCE's & Modifications to CIP
<b>December 15, 2017</b>	First GLWA CIP Committee Review of CIP – Version 1
<b>December 19, 2017</b>	First Customer Review of CIP – Version 1 at Customer Charges Rollout Meeting #1
<b>February 6, 2018</b>	Second GLWA CIP Committee Review of CIP – Version 2
<b>February 8, 2018</b>	Second Customer Review of CIP – Version 2 at AM/CIP Customer Outreach Work Group
<b>February 14, 2018</b>	First GLWA Board Workshop for Review of CIP – Introduction
<b>February 28, 2018</b>	Second GLWA Board Meeting – Proposed CIP Adoption
<b>March 14, 2018</b>	Proposed Alternate GLWA Board Meeting for CIP Adoption
<b>July 1, 2018</b>	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 5-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**

<b>Project Status</b>	<b>Description</b>
<b>New</b>	Project that has never been included in a previous CIP.
<b>Future Planned</b>	Project that was included in the previous CIP, has never had expenditures charged to it and does not have an assigned BS&A Project Number.
<b>Active</b>	Project that has an assigned BS&A Project Number in the financial system and the procurement process has been initiated for one or more the project's phases.
<b>Pending Close-out</b>	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.
<b>Closed</b>	Project that has been officially completed.
<b>Reclassified</b>	Project that has been merged into the scope of work of an existing project.
<b>Cancelled</b>	Project that has been completely cancelled and removed from the CIP.
<b>Archived</b>	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 have been 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 have been rolled up by their major category of Water, Wastewater and Centralized Services. Totals are provided. Projects have also been 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 - Water 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 a 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 likely be available for the 2020 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 remains unchanged, however, in order to show each project on the risk matrix, the eight criteria used in the project prioritization framework are 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 have been calculated. This provides 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 is 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

Probability of Failure (PoF)	5	Yellow	Yellow	Red	Red	Red
	4	Yellow	Yellow	Yellow	Red	Red
	3	Green	Yellow	Yellow	Yellow	Red
	2	Green	Green	Yellow	Yellow	Yellow
	1	Green	Green	Green	Yellow	Yellow
		1	2	3	4	5
Consequence of Failure (CoF)						

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 Estimation Classifications

New to the CIP this year, a cost estimate classification rating has been included for each phase of most projects, based upon the estimates' degree of accuracy according to the level of project definition. This cost estimate rating gives 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.

**Table II-6. 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/Reliability & 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 areas 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 & Reliability:** Projects that have a direct impact at improving system redundancy and reliability.
- **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, Financial Services Areas 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 has 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 is beneficial to GLWA’s Procurement Group to determine overall procurement needs and resources, as well as, for the engineering work areas to manage project delivery. Finally, this schedule provides 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	Design and Build			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	Future Planned Start	Scope Development	1/22/2018	100	5/2/2018
Contract No	NA	Procurement	7/1/2018	220	2/6/2019
Cost Est Class		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.

- ✓ Develop transparency in the financial plan.
- ✓ Collaborate internally and externally.
- ✓ Ensure 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 include 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 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, the terms 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 ongoing improvements in this year's "CIP *financial plan*" process. The 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. **Oakland-Macomb Interceptor Drainage District (OMID)** represents costs that are allocable to a portion of the sewer system that receives flows from OMID's system.
3. **Suburban Only** represents costs that are allocable to wholesale customers outside the City of Detroit.
4. **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.
5. **Industrial Waste Control Facilities (IWC)** provide for the pretreatment of industrial wastewater.



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

**Table III-1. Cost Allocation**

Cost Allocation	Projected Capital Expenditures					Total FYs 2019-2023	Percent of Five Year Total
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Water</b>							
Common-to-all	\$ 61,425	\$ 133,893	\$ 152,044	\$ 174,303	\$ 171,074	\$ 692,739	97%
Suburban Only	4,613	3,690	3,690	3,997	4,100	20,090	3%
<b>Grand Total</b>	<b>\$ 66,038</b>	<b>\$ 137,583</b>	<b>\$ 155,734</b>	<b>\$ 178,300</b>	<b>\$ 175,174</b>	<b>\$ 712,829</b>	<b>100%</b>

Cost Allocation	Projected Capital Expenditures					Total FYs 2019-2023	Percent of Five Year Total
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Wastewater</b>							
Common-to-all	\$ 91,905	\$ 97,173	\$ 95,193	\$ 109,140	\$ 143,107	\$ 536,518	85%
OMID	-	-	13,408	22,920	16,000	52,328	8%
CSO 83/17	9,277	6,218	2,351	4,351	9,351	31,548	5%
Industrial Waste Control	4,001	7,764	1,000	-	-	12,765	2%
<b>Grand Total</b>	<b>\$ 105,183</b>	<b>\$ 111,155</b>	<b>\$ 111,952</b>	<b>\$ 136,411</b>	<b>\$ 168,458</b>	<b>\$ 633,159</b>	<b>100%</b>

## 2.2. CIP Funding Based on Estimated Useful Life

GLWA advances sustainability with cross-functional long-term planning. The long-term financial plan differentiates 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. As a general rule, assets with a life of less than 20 years are funded with I&E Funds. Assets with a life greater than 20 years are funded with a blend of

debt and I&E Funds. Building I&E Funds over time allows GLWA to position itself to further reduce reliance on debt. This CIP does not require new debt to be issued in the second year of the (FY 2020) of the financial plan. Exceptions to that plan may be to take advantage of lower cost borrowings from the revolving fund loan programs or a revision of the plan to optimize refunding savings. For this reason, the five-year financial plan is regularly reviewed during the fiscal year. Updates may also occur due to grant awards, collaboration opportunities, and changes in 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. Shorter-lived assets scheduled for acquisition or replacement are identified in the five year capital outlay plan provided in the GLWA Biennial Budget and Five-Year Plan document.

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

Asset Life Range	Projected Capital Expenditures					Total FYs 2019-2023	Percent of Five Year Total
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Water</b>							
<20 years	\$ 13,172	\$ 11,209	\$ 12,565	\$ 11,280	\$ 12,007	\$ 60,233	8%
>20 years	52,866	126,374	143,169	167,020	163,167	652,596	92%
<b>Grand Total</b>	<b>\$ 66,038</b>	<b>\$ 137,583</b>	<b>\$ 155,734</b>	<b>\$ 178,300</b>	<b>\$ 175,174</b>	<b>\$ 712,829</b>	<b>100%</b>
Asset Life Range	Projected Capital Expenditures					Total FYs 2019-2023	Percent of Five Year Total
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Wastewater</b>							
<20 years	\$ 8,312	\$ 10,882	\$ 13,659	\$ 10,852	\$ 12,280	\$ 55,985	8.8%
>20 years	96,871	100,273	98,293	125,559	156,178	577,174	91%
<b>Grand Total</b>	<b>\$ 105,183</b>	<b>\$ 111,155</b>	<b>\$ 111,952</b>	<b>\$ 136,411</b>	<b>\$ 168,458</b>	<b>\$ 633,159</b>	<b>100%</b>

### 2.3. Project Status Analysis

As shown in Table III-3 below, 56% of the water system projects and 58% of the wastewater system projects are classified as “Active”. As defined in Chapter I, those projects with a Project

Status of “Active” are projects where one or more phases have started the procurement process. This is different from the prior year plan where the highest percentage was “not yet started”. This shift reflects an internal shift in processes as well as a natural progression of the project life cycle.

**Table III-3. Project Status Analysis**

Phase Status	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures				Total FYs 2019-2023
			FY 2020	FY 2021	FY 2022	FY 2023	
<b>Water</b>							
Active	\$ 36,933	56%	\$ 25,032	\$ 14,954	\$ 7,991	\$ 9,215	\$ 94,125
New	3,910	6%	7,667	9,444	15,744	31,786	68,551
Future Planned	25,192	38%	104,884	131,336	154,565	134,173	550,150
Pending Closeout	3	0%	-	-	-	-	3
Closed	-	0%	-	-	-	-	-
<b>Grand Total</b>	<b>\$ 66,038</b>	<b>100%</b>	<b>\$ 137,583</b>	<b>\$ 155,734</b>	<b>\$ 178,300</b>	<b>\$ 175,174</b>	<b>\$ 712,829</b>
Phase Status	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures				Total FYs 2019-2023
			FY 2020	FY 2021	FY 2022	FY 2023	
<b>Wastewater</b>							
Active	\$ 61,040	58%	\$ 40,386	\$ 12,902	\$ 2,250	\$ 2,057	\$ 118,635
New	-	0%	230	1,141	6,569	5,767	13,707
Future Planned	44,120	42%	70,539	97,909	127,592	160,634	500,794
Pending Closeout	23	0%	-	-	-	-	23
<b>Grand Total</b>	<b>\$ 105,183</b>	<b>100%</b>	<b>\$ 111,155</b>	<b>\$ 111,952</b>	<b>\$ 136,411</b>	<b>\$ 168,458</b>	<b>\$ 633,159</b>

## 2.4. Project Category Analysis

As noted in Chapter I, Section 4.2, 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

As shown in Table III-4 below, the majority of the dollars are allocated to construction and design build. From a financial standpoint, this increases the validity of the projected CIP spend as there are significantly less dollars assigned to pre-construction activities.

**Table III-4. Project Category Analysis**

Phase Status	Projected Capital Expenditures					Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Water</b>							
C	\$ 35,713	\$ 93,456	\$ 92,188	\$ 76,011	\$ 95,451	\$ 392,819	55%
CA	398	110	97	10	-	615	0%
D	396	150	200	200	200	1,146	0%
D/C	1,000	1,000	3,000	3,000	3,000	11,000	2%
D/CA	5,140	6,986	5,783	7,256	4,717	29,882	4%
DB	16,012	28,871	49,770	88,673	68,527	251,853	35%
S	2,759	153	-	-	-	2,912	0%
S/D/C	-	188	229	1,064	1,682	3,163	0%
S/D/CA	4,620	6,669	4,467	2,086	1,597	19,439	3%
<b>Grand Total</b>	<b>\$ 66,038</b>	<b>\$ 137,583</b>	<b>\$ 155,734</b>	<b>\$ 178,300</b>	<b>\$ 175,174</b>	<b>\$ 712,829</b>	<b>100%</b>

Phase Status	Projected Capital Expenditures					Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
<b>Wastewater</b>							
C	\$ 69,322	\$ 73,691	\$ 78,227	\$ 111,216	\$ 141,659	\$ 474,115	75%
CM	597	156	-	-	-	753	0%
D	137	892	2,936	1,288	908	6,161	1%
D/C	2,456	4,951	2,351	4,351	9,351	23,460	4%
D/CA	597	543	494	-	-	1,634	0%
DB	16,327	12,053	10,187	10,187	10,187	58,941	9%
S	-	-	1,110	340	90	1,540	0%
S/D/C	9,100	9,160	1,760	1,255	1,439	22,714	4%
S/D/CA	6,647	9,709	14,887	7,774	4,824	43,841	7%
<b>Grand Total</b>	<b>\$ 105,183</b>	<b>\$ 111,155</b>	<b>\$ 111,952</b>	<b>\$ 136,411</b>	<b>\$ 168,458</b>	<b>\$ 633,159</b>	<b>100%</b>

## 2.5. Plan of Finance

The CIP financial plan is shown in Table III-5 below. This table focuses 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. Anticipation of bond issuance for CIP projects with an estimated useful life greater than 20 years.
2. Reduction of necessary bond proceeds to the extent that state revolving fund loans and grants are received.
3. Inclusion of transfers from the I&E Funds limited to actual funds received to date.
4. Limitation of I&E Funds to CIP requests with an estimated useful life less than 20 years.
5. Evaluation of the use of I&E Funds to reduce future debt issuances.
6. Expectation of actual expenses (Uses) to be materially close to the sum of the CIP requests. This is largely due to additional layers and rounds of review to develop a CIP that balanced priorities with capacity to successfully execute projects.



**Table III-5. Capital Plan of Finance - Sources and Uses of Capital Spending**

Financial Plan - Sources and Uses of Capital Spending						
Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<b>Water Construction Bond Fund</b>						
<b>Revenue (Sources)</b>						
Bond Proceeds	\$ -	\$ -	\$ 145,000	\$ -	\$ 140,000	\$ 145,000
Investment Earnings	-	743	462	408	252	500
Transfer In from I&E - Specific	10,315	13,172	11,209	12,565	11,280	12,007
Transfer In from I&E - Strategic	-	-	-	80,000	20,000	-
<b>Total Revenue (Sources)</b>	<b>10,315</b>	<b>13,915</b>	<b>156,671</b>	<b>92,973</b>	<b>171,532</b>	<b>157,507</b>
<b>Expenses (Uses)</b>						
Construction	30,231	52,431	123,229	143,924	167,582	167,665
Engineering Services	8,871	11,885	12,580	10,074	9,220	6,115
Internal Costs	941	1,722	1,774	1,736	1,498	1,394
<b>Total Expenses (Uses)</b>	<b>40,043</b>	<b>66,038</b>	<b>137,583</b>	<b>155,734</b>	<b>178,300</b>	<b>175,174</b>
<b>Increase/(Decrease) in Reserves</b>	<b>(29,728)</b>	<b>(52,123)</b>	<b>19,088</b>	<b>(62,761)</b>	<b>(6,768)</b>	<b>(17,667)</b>
<b>Beginning Net Position</b>	<b>173,000</b>	<b>143,272</b>	<b>91,149</b>	<b>110,237</b>	<b>47,476</b>	<b>40,708</b>
<b>Ending Net Position</b>	<b>\$ 143,272</b>	<b>\$ 91,149</b>	<b>\$ 110,237</b>	<b>\$ 47,476</b>	<b>\$ 40,708</b>	<b>\$ 23,041</b>

Financial Plan - Sources and Uses of Capital Spending						
Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<b>Wastewater (Sewage Disposal) Construction Bond Fund</b>						
<b>Revenue (Sources)</b>						
Bond Proceeds	\$ -	\$ -	\$ 75,000	\$ 135,000	\$ -	\$ 140,000
Investment Earnings	429	299	633	361	194	300
Revolving Fund and Other Loans	45,965	42,197	30,923	20,799	10,187	10,187
Transfer In from I&E - Specific	3,380	8,312	10,882	13,659	10,852	12,280
Transfer In from I&E - Strategic	-	-	5,000	-	5,000	5,000
<b>Total Revenue (Sources)</b>	<b>49,774</b>	<b>50,808</b>	<b>122,438</b>	<b>169,819</b>	<b>26,233</b>	<b>167,767</b>
<b>Expenses (Uses)</b>						
Construction	60,465	88,803	89,479	76,916	97,688	136,274
Engineering Services	4,953	8,001	13,290	15,639	9,184	6,630
Internal Costs	5,214	8,379	8,386	5,989	6,619	9,554
Other	-	-	-	13,408	22,920	16,000
<b>Total Expenses (Uses)</b>	<b>70,632</b>	<b>105,183</b>	<b>111,155</b>	<b>111,952</b>	<b>136,411</b>	<b>168,458</b>
<b>Increase/(Decrease) in Reserves</b>	<b>(20,858)</b>	<b>(54,375)</b>	<b>11,283</b>	<b>57,867</b>	<b>(110,178)</b>	<b>(691)</b>
<b>Beginning Net Position</b>	<b>136,000</b>	<b>115,142</b>	<b>60,767</b>	<b>72,050</b>	<b>129,917</b>	<b>19,739</b>
<b>Ending Net Position</b>	<b>\$ 115,142</b>	<b>\$ 60,767</b>	<b>\$ 72,050</b>	<b>\$ 129,917</b>	<b>\$ 19,739</b>	<b>\$ 19,048</b>

## 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

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

### 1.3. Redundancy & Reliability Projects

Finally, redundancy and reliability in the transmission system and wastewater facilities is of high importance to GLWA. The following projects will enhance the redundancy and/or reliability within the water transmission system or within the wastewater system:

**Table IV-3 . Redundancy & Reliability Projects**

CIP	Title
<b>111001</b>	LH WTP Low and High Lift Pumping, Filter Backwash Pumps & Flocculation Improvements
<b>114009</b>	SPW WTP Service Area Redundancy Study
<b>114013</b>	SPW WTP Reservoir Fill Line Improvements
<b>122001</b>	Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road
<b>122003</b>	Waterworks Park WTP to Northeast WTP Transmission Main
<b>122004</b>	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main
<b>122005</b>	Transmission System Water Main Work - Replacement of Schoolcraft Water Main
<b>122006</b>	Transmission System Water Main Work-Wick Road Parallel Water Main
<b>122007</b>	Hannan Road Transmission Main
<b>122009</b>	Water System Improvements in Joy Road from Southfield Road to Trinity

<b>122010</b>	Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois
<b>122011</b>	Park-Merriman Water Main-Final Phase
<b>122012</b>	36-inch Water Main in Telegraph Road
<b>122013</b>	14 Mile Transmission Main Loop
<b>122014</b>	Romulus 48-inch Water Main Installation
<b>122015</b>	30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River
<b>122016</b>	Downriver Transmission Main Loop
<b>132003</b>	West Service Center PS - Isolation Gate Valves for Line Pumps
<b>132016</b>	North Service Center BPS Improvements
<b>132017</b>	North Service Center BPS - On-Site & Off-Site Yard Piping & Valve Replacement
<b>132018</b>	Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps & Underdrain System
<b>132019</b>	Wick Road BPS - Switchgear, Control Valves & Hydropneumatic Tank Replacement
<b>170400</b>	Water Transmission Improvement Program
<b>170500</b>	Transmission System Valve Rehabilitation and Replacement Program
<b>211001</b>	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery
<b>211002</b>	WRRF PS No. 2 Pumping Improvements - Phase 1
<b>211003</b>	WRRF Rehabilitation of Primary Clarifiers
<b>211004</b>	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements
<b>211005</b>	WRRF PS No. 2 Improvements Phase II
<b>211006</b>	WRRF PS No. 1 Improvements
<b>211007</b>	WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements
<b>211008</b>	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines
<b>211009</b>	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System

<b>212001</b>	WRRF Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Secondary Clarifiers
<b>212002</b>	WRRF Study, Design, & Construction Management Services for Modified Detroit River Outfall No. 2
<b>212003</b>	WRRF Aeration System Improvements
<b>212004</b>	WRRF Chlorination and Dechlorination Process Equipment Improvements
<b>212005</b>	WRRF Rouge River Outfall No. 2 (RRO-2) Segment 1
<b>212006</b>	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)
<b>212007</b>	WRRF Rehabilitation of the Secondary Clarifiers
<b>212008</b>	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)
<b>213001</b>	WRRF Replacement of Belt Filter Presses for Complex I and Upper Level Complex II
<b>213002</b>	WRRF Rehabilitation of Central Offload Facility
<b>213003</b>	WRRF Sewage Sludge Incinerator Air Quality Improvements
<b>213004</b>	WRRF Biosolids Dryer Facility
<b>213005</b>	WRRF Complex I Incinerators Decommissioning and Reusability
<b>213006</b>	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities
<b>213007</b>	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II
<b>213008</b>	WRRF Rehabilitation of the Ash Handling Systems
<b>213009</b>	WRRF Phosphorous Recovery Evaluation
<b>214001</b>	WRRF Relocation of Industrial Waste Control Division and Analytical Laboratory Operations
<b>216001</b>	Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements
<b>216002</b>	Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements
<b>216004</b>	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF
<b>216005</b>	Rehabilitation of the Main Plant Maintenance Building & Other Maintenance Areas and Improvement of Work Environment

<b>216006</b>	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station
<b>216007</b>	DTE Primary Electric 3rd Feed Supply to WRRF
<b>222001</b>	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District
<b>222002</b>	Detroit River Interceptor (DRI) Evaluation and Rehabilitation
<b>222003</b>	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation
<b>222004</b>	Collection System Valve Remote Operation Structure Improvements
<b>222007</b>	NIEA Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.
<b>232001</b>	Fairview Pumping Station - Replace Four Sanitary Pumps
<b>232002</b>	Freud & Conner Creek Pump Station Improvements
<b>232003</b>	Northeast Pumping Station
<b>233002</b>	Collection System In System Storage Devices (ISDs) Improvement
<b>251002</b>	Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade
<b>260100</b>	WRRF, Lift Station and Wastewater Collection System Structures Allowance
<b>260200</b>	Sewer and Interceptor Rehabilitation Program
<b>260300</b>	Scheduled Replacement Program of Critical Assets
<b>260400</b>	Sewage Meter Design, Installation, Replacement and Rehabilitation Program
<b>260500</b>	CSO Outfall Rehabilitation
<b>260600</b>	CSO Facilities Improvement Program
<b>331002</b>	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment Basins (RTB) and Screening Disinfection Facilities (SDF)
<b>381000</b>	Energy Management: Electric Metering Improvement Program



## 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:

**Table IV-4 . Northeast Water Treatment Plant Repurposing Related Projects**

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

## 1.5. Projects By Jurisdiction

Projects are listed below under the jurisdiction of the physical location of the project. Because many projects are planned for multiple facilities within multiple jurisdictions, many of these projects are identified as “Multiple Counties”. In addition, to get a spatial view and understanding of these project locations, approximately one month after the CIP has been officially adopted by the Board, these projects and the associated BCE information will be shown in the CIP Viewer located within the WAMR and GDRSS Customer Outreach Portals.

**Table IV-5. Projects by physical jurisdiction**

Jurisdiction		CIP Projects			
<b>City of Detroit</b>					
112001	122003	211004	212005	213007	216006
112002	122009	211005	212006	213008	216007
112003	122010	211006	212007	213009	222002
112004	122015	211007	212008	214001	222007
115001	132009	211008	213001	215001	232001
115002	171100	211009	213002	216001	232002
115003	171300	212001	213003	216002	232003
115004	211001	212002	213004	216003	361001
116001	211002	212003	213005	216004	361002
116002	211003	212004	213006	216005	380600
<b>Lapeer County</b>					
132007	132021				
<b>Macomb County</b>					
122001					
<b>Oakland County</b>					
122013	132004	132011	132014	132017	
132003	132010	132013	132016	132020	
<b>Saint Clair County</b>					
111001	111003	111005	111007	171000	
111002	111004	111006	111008		
<b>Wayne County – Outside Detroit</b>					
113001	114001	114009	122005	132001	132022
113002	114002	114010	122006	132002	171200
113003	114004	114011	122007	132006	
113004	114005	114012	122011	132012	
113005	114006	114013	122012	132015	
113006	114007	114014	122014	132018	
113007	114008	114015	122016	132019	
<b>Multiple Counties</b>					
114003	132024	170700	222005	260400	380500
116003	161001	170800	222006	260500	380700

Jurisdiction		CIP Projects			
116004	170100	170900	233001	260600	380800
122002	170200	171400	233002	331001	380900
122004	170300	171500	251002	331002	381000
132005	170400	222001	260100	351001	
132008	170500	222003	260200	361003	

Jurisdiction		CIP Projects			
132023	170600	222004	260300	380400	

## SECTION 2 5-YEAR CIP SUMMARY TABLES

The Great Lakes Water Authority 2019-2023 Capital Improvement Plan overall summary tables can be seen below. Please note that projected expenses and project categories shown in Table IV-7. Centralized Services are also included in Table IV-5. Water CIP Categories and Table IV-6. Wastewater CIP Categories. All financial figures are in thousands of dollars (\$1,000's).

**Table IV-6. 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
<b>Water</b>											
<b>Treatment Plants &amp; Facilities</b>											
Lake Huron	111	\$1,326	\$1,962	\$4,335	\$18,829	\$15,054	\$11,299	\$4,454	\$43,057	\$53,971	\$100,316
Northeast	112	163	70	831	1,642	2,167	1,992	112	62,265	6,744	69,242
Southwest	113	297	351	2,211	4,661	1,350	6	-	193,799	8,228	202,675
Springwells	114	84,336	12,340	15,484	18,244	16,513	20,773	10,282	173,816	81,296	351,788
Water Works Park	115	2,331	1,215	4,354	23,802	34,470	14,397	28	-	77,051	80,597
General Purpose	116	10	3,625	9,042	5,468	5,468	5,468	3,998	-	29,444	33,079
<b>Treatment Plants &amp; Facilities Total</b>		<b>88,463</b>	<b>19,563</b>	<b>36,257</b>	<b>72,646</b>	<b>75,022</b>	<b>53,935</b>	<b>18,874</b>	<b>472,937</b>	<b>256,734</b>	<b>837,697</b>
<b>Field Services</b>											
General Purpose	121	121	-	-	-	-	-	-	-	-	-
Transmission System	122	122	49,187	8,493	6,573	36,223	41,399	75,175	100,730	142,214	459,994
<b>Field Services Total</b>		<b>49,187</b>	<b>8,493</b>	<b>6,573</b>	<b>36,223</b>	<b>41,399</b>	<b>75,175</b>	<b>100,730</b>	<b>142,214</b>	<b>260,100</b>	<b>459,994</b>
<b>SCC</b>											
General Purpose	131	131	-	-	-	-	-	-	-	-	-
Pump Station/Reservoir	132	132	861	1,279	2,783	6,273	14,066	27,290	27,825	105,741	186,118
<b>SCC Total</b>		<b>861</b>	<b>1,279</b>	<b>2,783</b>	<b>6,273</b>	<b>14,066</b>	<b>27,290</b>	<b>27,825</b>	<b>105,741</b>	<b>78,237</b>	<b>186,118</b>
<b>Water Quality</b>											
General Purpose	141	-	-	-	-	-	-	-	-	-	-
<b>Water Quality Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Metering</b>											

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
General Purpose	151	-	-	-	-	-	-	-	-	-	-
<b>Metering Total</b>		-	-	-	-	-	-	-	-	-	-
General Purpose											
General Purpose	161	330	-	-	-	-	-	-	-	-	330
<b>General Purpose Total</b>		<b>330</b>	-	-	-	-	-	-	-	-	<b>330</b>
Programs											
Programs	170	20,779	9,922	17,697	19,373	23,738	20,598	26,063	61,893	107,469	200,063
<b>Programs Total</b>		<b>20,779</b>	<b>9,922</b>	<b>17,697</b>	<b>19,373</b>	<b>23,738</b>	<b>20,598</b>	<b>26,063</b>	<b>61,893</b>	<b>107,469</b>	<b>200,063</b>
<b>Water Total</b>		<b>159,620</b>	<b>39,257</b>	<b>63,310</b>	<b>134,515</b>	<b>154,225</b>	<b>176,998</b>	<b>173,492</b>	<b>782,785</b>	<b>702,540</b>	<b>1,684,202</b>
Water Central Services											
Information Technology	31X	-	-	-	-	-	-	-	-	-	-
Fleet	32X	-	-	-	-	-	-	-	-	-	-
Facilities	33X	-	-	-	128	169	809	1,243	4,844	2,349	7,193
Security	34X	-	-	-	-	-	-	-	-	-	-
Energy Management	35X	-	2	1,172	1,600	-	-	-	-	2,772	2,774
Engineering	36X	630	60	-	-	-	-	-	-	-	690
General Purpose	371	-	-	-	-	-	-	-	-	-	-
Programs	38XX	668	724	1,556	1,340	1,340	493	439	2,186	5,168	8,746
<b>Water Central Services Total</b>		<b>1,298</b>	<b>786</b>	<b>2,728</b>	<b>3,068</b>	<b>1,509</b>	<b>1,302</b>	<b>1,682</b>	<b>7,030</b>	<b>10,289</b>	<b>19,403</b>
<b>Grand Total</b>		<b>\$160,918</b>	<b>\$40,043</b>	<b>\$66,038</b>	<b>\$137,583</b>	<b>\$155,734</b>	<b>\$178,300</b>	<b>\$175,174</b>	<b>\$789,815</b>	<b>\$712,829</b>	<b>\$1,703,605</b>

**Table IV-7. 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	\$17,509	\$22,028	\$12,490	\$12,708	\$24,396	\$36,635	\$19,956	\$108,257	\$178,720
Secondary Treatment & Disinfection	212	55,925	29,892	20,637	10,191	3,176	10,249	14,983	26,485	59,236	171,538
Residuals Management	213	89,534	1,884	13,257	19,620	9,408	7,226	9,551	10,501	59,062	160,981
IWC	214	182	-	4,001	7,764	1,000	-	-	-	12,765	12,947
CSO RTB & SDF	215	-	-	-	-	-	-	-	-	-	-
General Purpose	216	32,813	1,073	2,553	7,001	7,899	7,174	17,530	24,026	42,157	100,069

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
<b>WRRF Total</b>		<b>211,452</b>	<b>50,358</b>	<b>62,476</b>	<b>57,066</b>	<b>34,191</b>	<b>49,045</b>	<b>78,699</b>	<b>80,968</b>	<b>281,477</b>	<b>624,255</b>
Field Services											
General Purpose	221	-	-	-	-	-	-	-	-	-	-
Interceptors	222	5	2,914	3,107	11,258	25,854	33,837	29,168	28,422	103,224	134,565
<b>Field Services Total</b>		<b>5</b>	<b>2,914</b>	<b>3,107</b>	<b>11,258</b>	<b>25,854</b>	<b>33,837</b>	<b>29,168</b>	<b>28,422</b>	<b>103,224</b>	<b>134,565</b>
SCC											
General Purpose	231	-	-	-	-	-	-	-	-	-	-
Pumping Stations	232	2,879	1,892	13,286	14,414	6,605	12,502	24,000	15,000	70,807	90,578
In System Devices	233	-	86	82	382	2,000	1,000	-	-	3,464	3,550
<b>SCC Total</b>		<b>2,879</b>	<b>1,978</b>	<b>13,368</b>	<b>14,796</b>	<b>8,605</b>	<b>13,502</b>	<b>24,000</b>	<b>15,000</b>	<b>74,271</b>	<b>94,128</b>
Metering											
General Purpose	241	-	-	-	-	-	-	-	-	-	-
<b>Metering Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
General Purpose											
General Purpose	251	-	-	877	2,653	7,012	3,506	-	-	14,048	14,048
<b>General Purpose Total</b>		<b>-</b>	<b>-</b>	<b>877</b>	<b>2,653</b>	<b>7,012</b>	<b>3,506</b>	<b>-</b>	<b>-</b>	<b>14,048</b>	<b>14,048</b>
Programs											
Programs	260	18,975	14,276	23,185	23,244	29,852	31,152	36,152	35,852	143,585	212,688
<b>Programs Total</b>		<b>18,975</b>	<b>14,276</b>	<b>23,185</b>	<b>23,244</b>	<b>29,852</b>	<b>31,152</b>	<b>36,152</b>	<b>35,852</b>	<b>143,585</b>	<b>212,688</b>
<b>Wastewater Total</b>		<b>233,311</b>	<b>69,526</b>	<b>103,013</b>	<b>109,017</b>	<b>105,514</b>	<b>131,042</b>	<b>168,019</b>	<b>160,242</b>	<b>616,605</b>	<b>1,079,684</b>
Wastewater Central Services											
Information Technology	31X	-	-	-	-	-	-	-	-	-	-
Fleet	32X	-	-	-	-	-	-	-	-	-	-
Facilities	33X	-	-	286	709	5,575	5,114	-	-	11,684	11,684
Security	34X	-	-	-	-	-	-	-	-	-	-
Energy Management	35X	-	-	-	-	-	-	-	-	-	-
Engineering	36X	1,043	-	-	-	-	-	-	-	-	1,043
General Purpose	37X	-	-	-	-	-	-	-	-	-	-
Programs	38XX	672	1,106	1,884	1,429	863	255	439	2,186	4,870	8,834
<b>Central Services Total</b>		<b>1,715</b>	<b>1,106</b>	<b>2,170</b>	<b>2,138</b>	<b>6,438</b>	<b>5,369</b>	<b>439</b>	<b>2,186</b>	<b>16,554</b>	<b>21,561</b>
<b>Grand Total</b>		<b>\$235,026</b>	<b>\$70,632</b>	<b>\$105,183</b>	<b>\$111,155</b>	<b>\$111,952</b>	<b>\$136,411</b>	<b>\$168,458</b>	<b>\$162,428</b>	<b>\$633,159</b>	<b>\$1,101,245</b>

**Table IV-8. Centralized Services Categories**

Please note that these project categories and projected expenses also appear in Water and Wastewater tables, Table IV-5 and IV-6, respectively.

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
<b>Information Technology</b>	<b>31X</b>										
Water		\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Wastewater		-	-	-	-	-	-	-	-	-	-
<b>Information Technology Total</b>		-	-	-	-	-	-	-	-	-	-
<b>Fleet</b>	<b>32X</b>										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
<b>Fleet Total</b>		-	-	-	-	-	-	-	-	-	-
<b>Facilities</b>	<b>33X</b>										
Water		-	-	-	128	169	809	1,243	4,844	2,349	7,193
Wastewater		-	-	286	709	5,575	5,114	-	-	11,684	11,684
<b>Facilities Total</b>		-	-	<b>286</b>	<b>837</b>	<b>5,744</b>	<b>5,923</b>	<b>1,243</b>	<b>4,844</b>	<b>14,033</b>	<b>18,877</b>
<b>Security</b>	<b>34X</b>										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
<b>Security Total</b>		-	-	-	-	-	-	-	-	-	-
<b>Energy Management</b>	<b>35X</b>										
Water		-	2	1,172	1,600	-	-	-	-	2,772	2,774
Wastewater		-	-	-	-	-	-	-	-	-	-
<b>Energy Management Total</b>		-	<b>2</b>	<b>1,172</b>	<b>1,600</b>	-	-	-	-	<b>2,772</b>	<b>2,774</b>
<b>Engineering</b>	<b>36X</b>										
Water		630	60	-	-	-	-	-	-	-	690
Wastewater		1,043	-	-	-	-	-	-	-	-	1,043
<b>Engineering Total</b>		<b>1,673</b>	<b>60</b>	-	-	-	-	-	-	-	<b>1,733</b>
<b>General Purpose</b>	<b>37X</b>										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
<b>General Purpose Total</b>		-	-	-	-	-	-	-	-	-	-
<b>Programs</b>	<b>38XX</b>										

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		668	724	1,556	1,340	1,340	493	439	2,186	5,168	8,746
Wastewater		672	1,106	1,884	1,429	863	255	439	2,186	4,870	8,834
<b>General Purpose Total</b>		<b>1,340</b>	<b>1,830</b>	<b>3,440</b>	<b>2,769</b>	<b>2,203</b>	<b>748</b>	<b>878</b>	<b>4,372</b>	<b>10,038</b>	<b>17,580</b>
<b>Grand Total</b>		<b>3,013</b>	<b>1,892</b>	<b>4,898</b>	<b>5,206</b>	<b>7,947</b>	<b>6,671</b>	<b>2,121</b>	<b>9,216</b>	<b>26,843</b>	<b>40,964</b>



## V. PROJECT PRIORITIZATION AND RISK EVALUATION

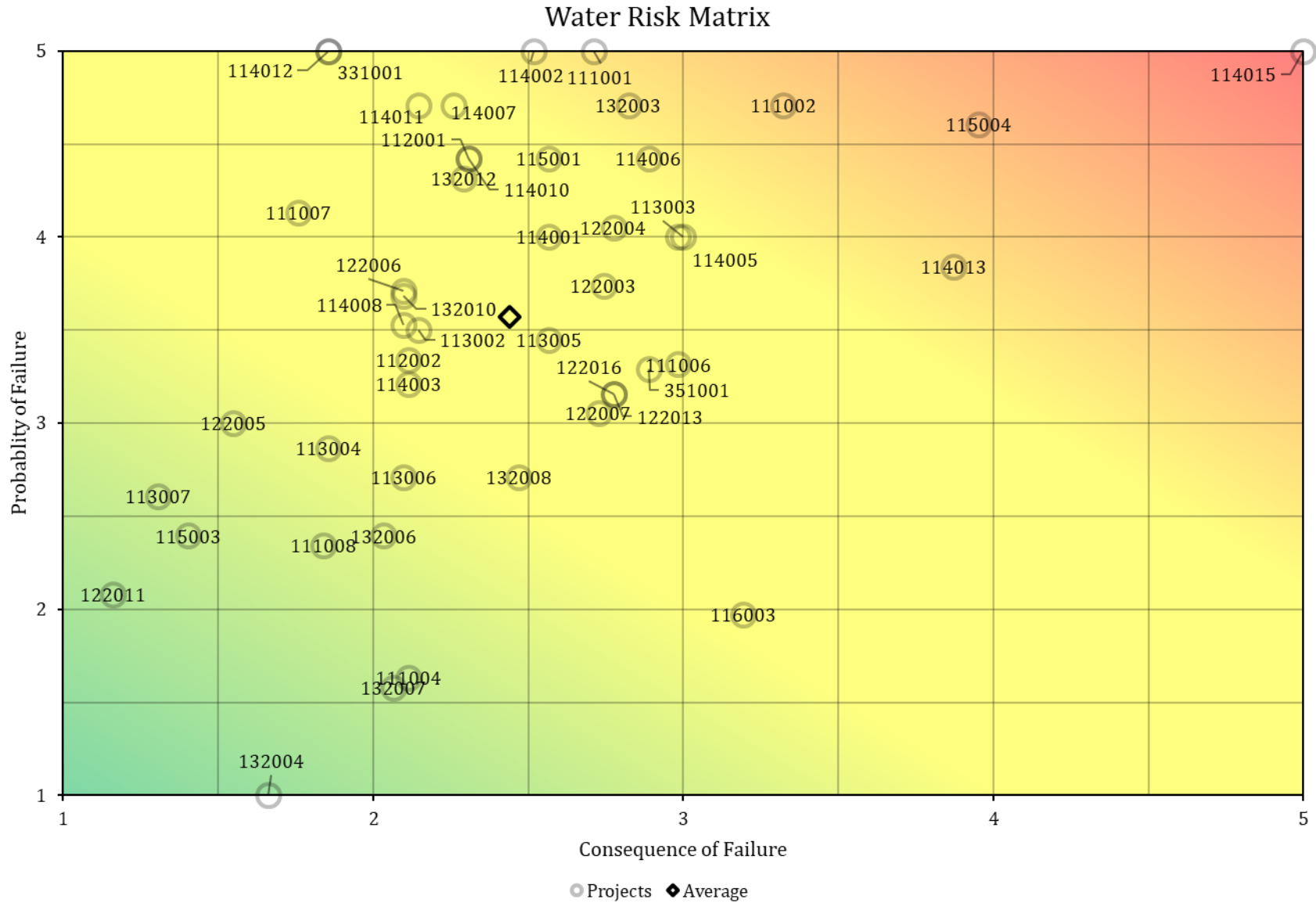
New and Future Planned water and wastewater projects were prioritized based upon eight criteria. The criteria and their weighting factors are identified in Table V-1.

Figure I-1 and 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.

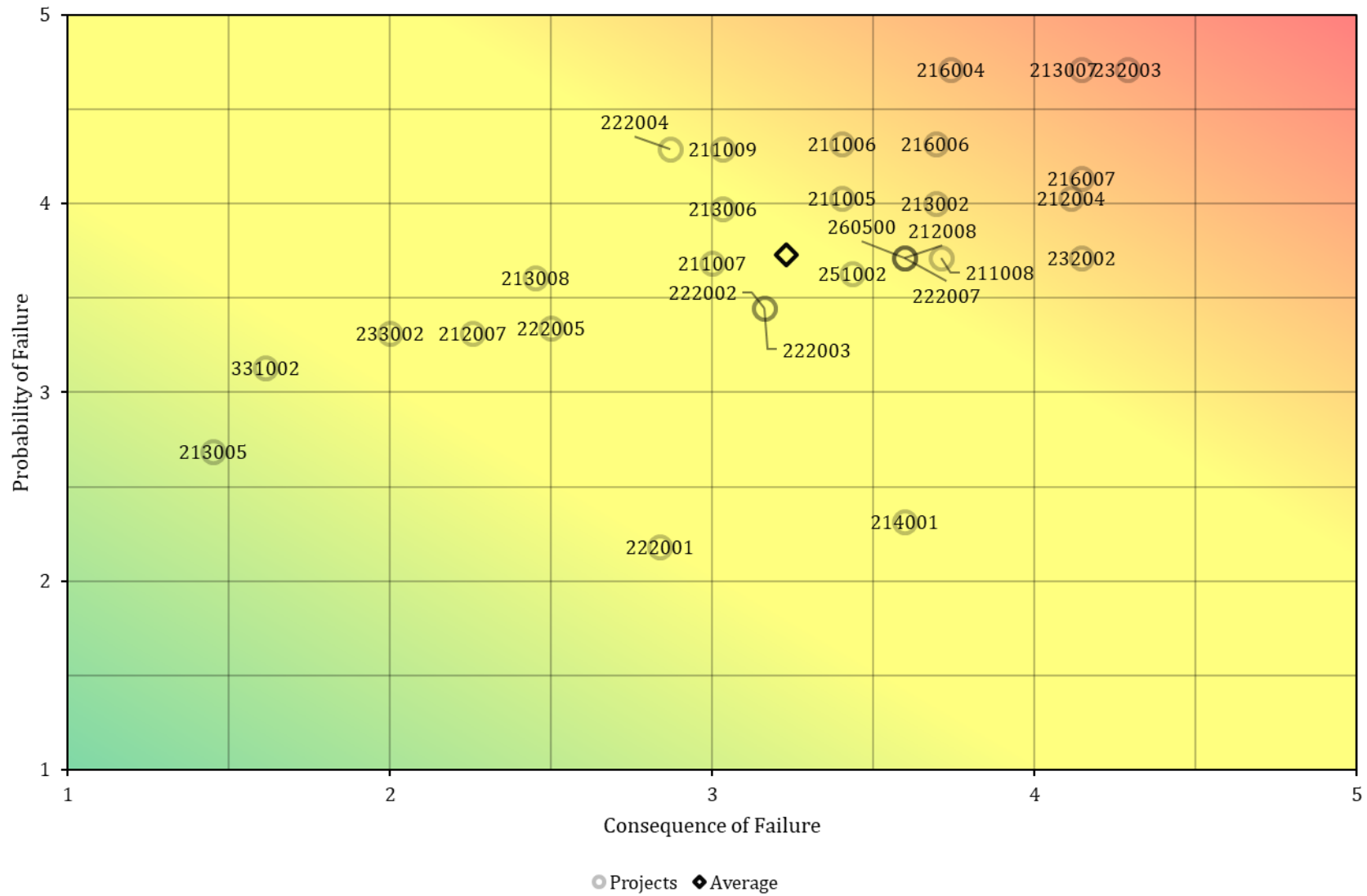
**Table V-1. Project Prioritization**

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 Matrix**

### Wastewater Risk



**Figure I-2. Wastewater Project Risk Matrix**

## SECTION 1 PROJECT MANAGER CRITERIA SCORES: WATER

Rank	CIP No.	Title		0	20	40	60	80	100	
1	114015	SPW WTP Emergency Grating Replacement	114015							
2	115004	WWP WTP Chlorine System Upgrade	115004							
3	114013	SPW WTP Reservoir Fill Line Improvements	114013							
4	111002	LH WTP Miscellaneous Mechanical HVAC Improvements	111002							
5	111001	LH WTP Low and High Lift Pumping, Filter Backwash Pumps...	111001							
6	132003	West Service Center PS - Isolation Gate Valves for Line Pumps	132003							
7	114006	SPW WTP Replacement of Rapid Mix Units 1958 Process Train	114006							
8	114002	SPW WTP Low Lift and High Lift Pump Station	114002							
9	113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber...	113003							
10	114005	SPW WTP Admin Blding Imp.& Underground Fire Protection Loop	114005							
11	115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	115001							
12	122004	96-inch Main Relocation, Isolation Valves Installations, and ...	122004							
13	114007	SPW WTP Powdered Activated Carbon System Improvements	114007							
14	114011	SPW WTP Steam, Condensate Return, and Compressed Air Piping...	114011							
15	122003	Waterworks Park WTP to Northeast WTP Transmission Main	122003							
16	111006	LH WTP Filter Instrumentation * Raw Water Flow Metering...	111006							
17	114001	SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities	114001							
18	114010	SPW WTP Yard Piping and High Lift Header Improvements	114010							
19	112001	NE WTP Yard Piping Replacement (State Fair Valve Rehab)	112001							
20	132012	Ypsilanti PS Improvements	132012							
21	331001	Roofing Systems Replac. at Water Plants & Booster Pump Stations	331001							
22	114012	SPW WTP Water Treatment Plant 1930 Filter Building-Roof...	114012							
23	351001	Water Facility Lighting Renovations	351001							
24	122013	14 Mile Transmission Main Loop	122013							
25	122016	Downriver Transmission Main Loop	122016							
26	113005	SW WTP Residuals Management	113005							
27	122007	Hannan Road Transmission Main	122007							
28	116003	Genesee and Lapeer County Transmission System Improvements	116003							
29	122006	Transmission System Water Main Work-Wick Road Parallel Water...	122006							
30	132010	West Service Center PS - Duval Rd Division Valve Upgrades	132010							
31	113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	113002							

Rank	CIP No.	Title		0	20	40	60	80	100
32	111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping System...	111007						
33	114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides & Hoists...	114008						
34	112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	112002						
35	132008	Various PS's - Needs Assessment Study	132008						
36	114003	WTP Water Production Flow Metering Improvements at NE, SW...	114003						
37	113006	SW WTP Chlorine Scrubber, Raw Water Screens & Related...	113006						
38	113004	SW WTP Raw Water Sampling Modifications	113004						
39	132006	Ford Road PS - Pressure and Control Improvements	132006						
40	122005	Transmission System Water Main Work - Replacement of...	122005						
41	111008	LH WTP Architectural Programming - Laboratory and Admin...	111008						
42	111004	LH WTP Electrical Tunnel Rehabilitation	111004						
43	132007	Imlay PS - Energy Management: Freeze Protection Pump...	132007						
44	113007	SW WTP Architectural and Building Mechanical Improvements	113007						
45	115003	WWP WTP Comprehensive Condition Assessment	115003						
46	122011	Park-Merriman Water Main-Final Phase	122011						
47	132004	North Service Center PS - Hydraulic Surge Control	132004						
48	132023	Reservoir Inspection, Design & Rehabilitation @ various Pumping...	132023						
49	132024	Reservoir Inspection, Design and Rehabilitation @ Adams, East-...	132024						
50	132014	Adams Road Pumping Booster Pumping & Switch Gear...	132014						
51	132015	Newburgh BPS - Pumping System & Building Upgrades	132015						
52	132020	Franklin BPS - Isolation Gate Valves & Electrical Actuator...	132020						
53	132017	North Service Center BPS - On-Site & Off-Site Yard Piping & Valve...	132017						
54	132019	Wick Road BPS - Switchgear, Control Valves & Hydropneumatic...	132019						
55	132022	Joy Road BPS - Replace Reservoir Pumps, Motors and Isolation...	132022						
56	132016	North Service Center BPS Improvements	132016						
57	132018	Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps...	132018						
58	132013	Adams Road Pumping Booster VFD & Gate Valves to Optimize...	132013						
59	171200	SW-WTP Sanitary Survey Improvements	171200						
60	112004	NE - WTP Relocation of 12" service line at front of plant	112004						
61	116002	Pennsylvania, Springwells and Northeast Raw Water Supply...	116002						
62	112003	NE WTP High-Lift Pumping Station Electrical Improvements	112003						
63	122010	Water Main Replacement within the City of Detroit - Joy Rd from...	122010						

## 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	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
4	111002	LH WTP Miscellaneous Mechanical HVAC Improvements	5	4	1	4	4	1	4	4	66.8	5	5	4	4	4	0	3	4		77.0
5	111001	LH WTP Low and High 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
6	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
7	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
8	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
9	113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber...	4	5	3	4	4	2	1	2	66.6	4	4	3	4	4	2	3	2		67.6
10	114005	SPW WTP Admin Blding Imp.& Underground Fire Protection Loop	4	4	3	4	4	2	2	1	63.8	4	4	4	4	4	2	2	1		67.4
11	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
12	122004	96-inch Main Relocation, Isolation Valves Installations, and ...	4	5	3	5	3	4	3	2	72.6	2	5	2	5	4	5	1	2		65.2
13	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
14	114011	SPW WTP Steam, Condensate Return, and Compressed Air Piping...	5	5	1	3	4	1	3	3	63.8	5	5	1	4	3	1	2	4		62.4
15	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
16	111006	LH WTP Filter Instrumentation * Raw Water Flow Metering...	4	5	5	5	1	1	1	2	64.2	4	3	3	3	2	4	2	5		62.2
17	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
18	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
19	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
20	132012	Ypsilanti PS Improvements	5	5	3	4	2	2	5	3	72	5	4	1	4	3	2	3	3		61.2
21	331001	Roofing Systems Replac. at Water Plants & Booster Pump Stations	5	3	4	5	3	2	4	2	71.4	5	5	3	5	2	1	1	1		61.0
22	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
23	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
24	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
25	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
26	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
27	122007	Hannan Road Transmission Main	1	5	1	4	2	3	5	4	58.6	1	4	1	4	3	3	4	4		57.0
28	116003	Genesee and Lapeer County Transmission System Improvements	1	5	5	1	5	1	0	0	56.2	0	5	5	0	4	5	0	0		54.6
29	122006	Transmission System Water Main Work-Wick Road Parallel Water...	4	5	1	3	4	2	1	3	59	4	4	1	3	3	3	1	3		54.2
30	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
31	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
32	111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping System...	5	5	3	4	3	1	1	1	62.2	5	5	1	2	2	1	4	1		53.2
33	114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides & Hoists...	5	5	1	4	5	1	1	1	61.8	5	2	1	4	5	1	1	1		52.8



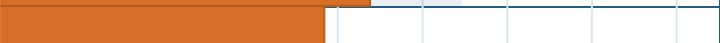
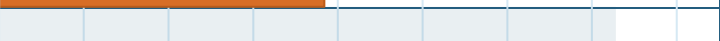
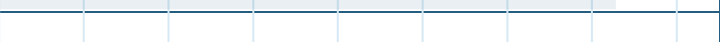







Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	Modifier	RC Score	
34	112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	5	3	1	2	5	1	1	1	51.4	5	3	2	2	4	1	1	1		51.6	
35	132008	Various PS's - Needs Assessment Study	3	2	2	3	2	1	1	5	46.4	3	3	1	2	2	2	4	5		51.2	
36	114003	WTP Water Production 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	
37	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	
38	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	
39	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	
40	122005	Transmission System Water Main Work - Replacement of...	5	5	1	4	5	1	2	2	65.6	3	3	1	3	3	1	1	1	1	1	42.0
41	111008	LH WTP Architectural Programming - Laboratory and Admin...	4	3	2	1	2	2	1	4	47.2	4	2	2	1	2	2	1	2		40.6	
42	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	
43	132007	Imlay PS - Energy Management: Freeze Protection Pump...	1	4	1	3	1	3	3	3	44.2	1	1	1	3	1	1	4	5		37.6	
44	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	
45	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	
46	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	
47	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	
48	132023	Reservoir Inspection, Design & Rehabilitation @ various Pumping...	4	3	5	3	4	3	1	1	65.4	0	0	0	0	0	0	0	0		0.0	
49	132024	Reservoir Inspection, Design and Rehabilitation @ Adams, East-...	4	3	5	3	4	3	1	1	65.4	0	0	0	0	0	0	0	0		0.0	
50	132014	Adams Road Pumping Booster Pumping & Switch Gear...	4	4	2	4	2	4	3	4	64	0	0	0	0	0	0	0	0		0.0	
51	132015	Newburgh BPS - Pumping System & Building Upgrades	4	4	1	4	2	2	3	4	57.2	0	0	0	0	0	0	0	0		0.0	
52	132020	Franklin BPS - Isolation Gate Valves & Electrical Actuator...	4	4	1	4	2	3	3	3	57	0	0	0	0	0	0	0	0		0.0	
53	132017	North Service Center BPS - On-Site & Off-Site Yard Piping & Valve...	5	5	1	5	1	2	2	2	55.8	0	0	0	0	0	0	0	0		0.0	
54	132019	Wick Road BPS - Switchgear, Control Valves & Hydropneumatic...	4	4	1	4	2	3	2	3	55	0	0	0	0	0	0	0	0		0.0	
55	132022	Joy Road BPS - Replace Reservoir Pumps, Motors and Isolation...	5	4	1	4	1	2	3	3	54.4	0	0	0	0	0	0	0	0		0.0	
56	132016	North Service Center BPS Improvements	4	3	1	4	2	2	3	4	54.2	0	0	0	0	0	0	0	0		0.0	
57	132018	Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps...	4	4	1	5	1	1	2	4	52.4	0	0	0	0	0	0	0	0		0.0	
58	132013	Adams Road Pumping Booster VFD & Gate Valves to Optimize...	3	4	1	3	1	3	3	3	49	0	0	0	0	0	0	0	0		0.0	
59	171200	SW-WTP Sanitary Survey Improvements	1	1	3	1	3	1	1	1	34	0	0	0	0	0	0	0	0		0.0	
60	112004	NE - WTP Relocation of 12" service line at front of plant	1	1	1	1	1	1	3	1	24	0	0	0	0	0	0	0	0		0.0	
61	116002	Pennsylvania, Springwells and Northeast Raw Water Supply...	5	5	3	5	5	5	5	1	85.6	0	0	0	0	0	0	0	0		0.0	
62	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	
63	122010	Water Main Replacement within the City of Detroit - Joy Rd from...									Not scored											

<sup>1</sup> 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		0	20	40	60	80	100
1	232003	Northeast Pumping Station	232003						
2	213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	213007						
3	216007	DTE Primary Electric 3rd Feed Supply to WRRF	216007						
4	216004	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride...	216004						
5	212004	WRRF Chlorination and Dechlorination Process Equipment Improvements	212004						
6	232002	Freud & Conner Creek Pump Station Improvements	232002						
7	216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural...	216006						
8	213002	WRRF Rehabilitation of Central Offload Facility	213002						
9	211006	WRRF PS No. 1 Improvements	211006						
10	211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex...	211008						
11	212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)	212008						
12	211005	WRRF PS No. 2 Improvements Phase II	211005						
13	260500	CSO Outfall Rehabilitation	260500						
14	222007	NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and...	222007						
15	211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal...	211009						
16	251002	Wastewater System-Wide Instrumentation & Control Software...	251002						
17	222004	Collection System Valve Remote Operation Structure Improvements	222004						
18	213006	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities	213006						
19	222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	222002						
20	222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	222003						
21	211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System...	211007						
22	214001	WRRF Relocation of Industrial Waste Control Division and...	214001						
23	216005	Rehabilitation of the Main Plant Maintenance Building & ...	213008						
24	213008	WRRF Rehabilitation of the Ash Handling Systems	222005						
25	212007	WRRF Rehabilitation of the Secondary Clarifiers	212007						
26	222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood...	222001						

Rank	CIP No.	Title		0	10	20	30	40	50	60	70	80
27	233002	Collection System In System Storage Devices (ISDs) Improvement	233002									
28	331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment...	331002									
29	213005	WRRF Complex I Incinerators Decommissioning and Reusability	213005									
30	232001	Fairview Pumping Station - Replace Four Sanitary Pumps	232001									
31	211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines	211001									
32	211002	WRRF PS No. 2 Pumping Improvements - Phase 1	211002									
33	211003	WRRF Rehabilitation of Primary Clarifiers	211003									
34	211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements	211004									
35	212003	WRRF Aeration System Improvements	212003									
36	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	232003	Northeast Pumping Station	5	3	4	4	3	5	5	4	79.6	5	5	4	4	4	5	5	4	89.0
2	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
3	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
4	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
5	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
6	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
7	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
8	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
9	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
10	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
11	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
12	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
13	260500	CSO Outfall Rehabilitation	4	5	3	4	3	2	4	4	72.8	4	4	4	3	3	3	4	4	72.8
14	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
15	211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal...	4	4	3	4	3	2	4	4	69.8	4	4	4	5	2	2	3	4	70.2
16	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
17	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
18	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
19	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
20	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
21	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
22	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
23	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

Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	RC Score
24	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
25	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
26	222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood...	1	4	2	1	3	4	3	3	51.8	1	4	2	1	3	4	3	3	51.8
27	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
28	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
29	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
30	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
31	211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines									Not scored									
32	211002	WRRF PS No. 2 Pumping Improvements - Phase 1									Not scored									
33	211003	WRRF Rehabilitation of Primary Clarifiers									Not scored									
34	211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements									Not scored									
35	212003	WRRF Aeration System Improvements									Not scored									
36	212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)									Not scored									

## VI. PROJECTS BY CATEGORY

### SECTION 1 WATER

All financial figures are in thousands of dollars (\$1,000's). The Project Status column shows which projects are Active (A), New this year (N), Future Planned (FP), Closed or Cancelled (C), Pending Closeout (PC), or have been Reclassified to a different number (R). In the Capital Expense Category (CapEx Category), projects are funded with Bonds (B) or the Improvement & Extension Fund (IE). Cost Allocation has been listed as Common-to-All (CTA) or Suburban Only (SO), 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	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures						2019-2023 CIP Total	Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond				
111001	LH WTP Low and High Lift Pumping, Filter Backwash Pumps & Flocculation Improvements	FP	2010	DE	CTA		0	0	0	401	1,611	3,169	4,450	42,757	9,631	52,388	1.4%	
111002	LH WTP Miscellaneous Mechanical HVAC Improvements	A	2014	DE	CTA	CON-182, CS-1732, CON-212	309	781	3,666	3,873	13	0	0	0	7,552	8,642	1.1%	
111004	LH WTP Electrical Tunnel Rehabilitation	FP	2014	DE	CTA	CS-245	0	116	414	4,296	6	0	0	0	4,716	4,832	0.7%	
111005	LH WTP Concrete Crack Repair	C	2014	DE	CTA	LH-397	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	A	2014	DE	CTA	CS-1771	253	643	43	8,647	9,816	6,909	4	0	25,419	26,315	3.6%	
111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping System Improvements	A	2016	DE	CTA	CS-171	9	422	212	1,612	3,608	1,221	0	0	6,653	7,084	0.9%	
111008	LH WTP Architectural Programming - Laboratory and Admin Building Architectural Improvements Study	N	2017	DE	CTA		0	0	0	0	0	0	0	300	0	300	0.0%	
112001	NE WTP Yard Piping Replacement (State Fair Valve Rehab)	FP	2014	DE	CTA		0	0	0	0	700	1,988	112	0	2,800	2,800	0.4%	
112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	A	2014	DE	CTA	CS-1744	163	70	831	619	30	4	0	0	1,484	1,717	0.2%	
112003	NE WTP High-Lift Pumping Station Electrical Improvements	N	2017	DE	CTA		0	0	0	0	0	0	0	62,265	0	62,265	0.0%	
112004	NE - WTP Relocation of 12" service line at front of plant	N		DE	CTA		0	0	0	1,023	1,437	0	0	0	2,460	2,460	0.3%	
113001	SW WTP Sludge Treatment & Waste Wash Water Treatment Facilities	C	2003	DE	CTA	SW-548	40	0	0	0	0	0	0	0	0	40	0.0%	



CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures							Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total			
113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	A	2014	DE	CTA	CS-034	115	186	1,157	2,876	1,144	6	0	0	5,183	5,484	0.7%	
113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements	A	2014	B	CTA		0	0	0	0	0	0	0	148,286	0	148,286	0.0%	
113004	SW WTP Raw Water Sampling Modifications	A	2014	DE	CTA	CS-1730	142	165	1,054	1,785	206	0	0	0	3,045	3,352	0.4%	
113005	SW WTP Residuals Management	N	2017	IE	CTA		0	0	0	0	0	0	0	1,145	0	1,145	0.0%	
113006	SW WTP Chlorine Scrubber, Raw Water Screens & Related Improvements	N	2017	DE	CTA		0	0	0	0	0	0	0	7,032	0	7,032	0.0%	
113007	SW WTP Architectural and Building Mechanical Improvements	N	2017	DE	CTA		0	0	0	0	0	0	0	37,336	0	37,336	0.0%	
114001	SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities	A	2002	B	CTA	SP-563, CS-1425, cs-073, CS-200	82,682	7,281	3,501	0	0	0	0	0	3,501	93,464	0.5%	
114002	SPW WTP Low Lift and High Lift Pump Station	A	2004	DE	CTA	CS-103	22	463	1,433	2,481	1,453	11,228	8,675	59,748	25,270	85,503	3.5%	
114003	WTP Water Production Flow Metering Improvements at NE, SW, and SPW WTP	A	2014	IE	CTA	CON-133	186	704	2,506	2,506	1,257	0	0	0	6,269	7,159	0.9%	
114004	SPW WTP Concrete Crack Repairs	C	2014	B	CTA	SP-570	495	0	0	0	0	0	0	0	0	495	0.0%	
114005	SPW WTP Administration Building Improvements & Underground Fire Protection Loop	FP	2014	DE	CTA		0	0	30	413	2,258	3,820	1,604	0	8,125	8,125	1.1%	
114006	SPW WTP Replacement of Rapid Mix Units 1958 Process Train	A	2014	DE	CTA	SCP-CS-045	104	123	1,284	211	0	0	0	0	1,495	1,722	0.2%	
114007	SPW WTP Powdered Activated Carbon System Improvements	FP	2014	DE	CTA		0	0	0	0	0	0	0	3,939	0	3,939	0.0%	
114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides & Hoists Improvements	FP	2014	DE	CTA		0	0	424	4,153	6,830	5,697	3	0	17,107	17,107	2.4%	
114009	SPW WTP Service Area Redundancy Study	PC	2014	IE	CTA	CS-1772	193	145	0	0	0	0	0	0	0	338	0.0%	
114010	SPW WTP Yard Piping and High Lift Header Improvements	FP	2012	DE	CTA		0	0	0	0	0	0	0	110,129	0	110,129	0.0%	
114011	SPW WTP Steam, Condensate Return, and Compressed Air Piping Improvements	A	2012	DE	CTA	CS-1671	280	450	1,406	4,824	4,654	7	0	0	10,891	11,621	1.5%	
114012	SPW WTP Water Treatment Plant 1930 Filter Building-Roof Replacement	A	2016	DE	CTA		0	486	2,420	0	0	0	0	0	2,420	2,906	0.3%	

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures						2019-2023 CIP Total	Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond				
114013	SPW WTP Reservoir Fill Line Improvements	A	2016	DE	CTA	SCP-CS-038	120	181	2,469	3,656	61	21	0	0	6,207	6,508	0.9%	
114014	SPW WTP Underground Fire Protection Loop Improvements	R	2016	IE	CTA		0	0	0	0	0	0	0	0	0	0	0.0%	
114015	SPW WTP Emergency Grating Replacement	A	2017	B	CTA		254	2,507	11	0	0	0	0	0	11	2,772	0.0%	
115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	A	2007	DE	CTA	CS-055	9	412	968	20,771	34,466	14,397	28	0	70,630	71,051	9.9%	
115002	WWP WTP Concrete and Road Improvements	C	2014	B	CTA	WW-538	1,951	0	0	0	0	0	0	0	0	1,951	0.0%	
115003	WWP WTP Comprehensive Condition Assessment	A	2014	IE	CTA		0	131	262	153	0	0	0	0	415	546	0.1%	
115004	WWP WTP Chlorine System Upgrade	A	2017	B	CTA	CS-1721	371	672	3,124	2,878	4	0	0	0	6,006	7,049	0.8%	
116001	WTP General Purpose Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	R	2014	DE	CTA	DB-150	0	0	0	0	0	0	0	0	0	0	0.0%	
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	A	2016	DE	CTA	DB-150	10	3,625	9,042	5,468	5,468	5,468	3,998	0	29,444	33,079	4.1%	
116003	Genesee and Lapeer County Transmission System Improvements	A	2016	DE	CTA	DBW-070	0	0	0	0	0	0	0	0	0	0	0.0%	
116004	WTP Right-Sizing Implementation Plan	C	2017	IE	CTA		0	0	0	0	0	0	0	0	0	0	0.0%	
122001	Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road	PC	2005	B	CTA	WS-681	32,571	2,813	0	0	0	0	0	0	0	35,384	0.0%	
122002	Replacement of Five (5) PRV Pits of Treated Water Transmission System	PC	2010	DE	CTA	DWS-891	1,697	670	0	0	0	0	0	0	0	2,367	0.0%	
122003	Waterworks Park WTP to Northeast WTP Transmission Main	A	2014	IE	CTA	CS-152	19	1,305	1,372	8,622	17,547	46,022	30,722	25,270	104,285	130,879	14.6%	
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main	A	2016	IE	CTA	CS-165	460	570	1,797	2,644	895	23,087	45,825	57,389	74,248	132,667	10.4%	
122005	Transmission System Water Main Work - Replacement of Schoolcraft Water Main	FP	2016	B	CTA		0	16	50	6,249	6,899	591	0	0	13,789	13,805	1.9%	
122006	Transmission System Water Main Work- Wick Road Parallel Water Main	FP	2016	B	CTA	CS-1448, CS-1488, CS-1488	23	16	1,743	12,373	10,154	10	0	0	24,280	24,319	3.4%	
122007	Hannan Road Transmission Main	FP	2016	B	CTA		0	6	653	1,611	2,076	901	0	0	5,241	5,247	0.7%	
122009	Water System Improvements in Joy Road from Southfield Road to Trinity	PC	2014	B	CTA	WS-693	107	0	0	0	0	0	0	0	0	107	0.0%	

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures							2019-2023 CIP Total	Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond					
122010	Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois	A	2014	SRF	CTA	WS-693	0	16	0	0	0	0	0	0	0	0	16	0.0%	
122011	Park-Merriman Water Main-Final Phase	FP	2015	B	CTA		0	23	955	3,676	1,549	6	0	0	6,186	6,209	0.9%		
122012	36-inch Water Main in Telegraph Road	PC	2012	B	CTA	WS-684A	8,125	2,257	3	0	0	0	0	0	3	10,385	0.0%		
122013	14 Mile Transmission Main Loop	FP	2017	B	CTA		0	0	0	751	1,315	1,507	13,420	37,433	16,993	54,426	2.4%		
122014	Romulus 48-inch Water Main Installation	PC	2015	B	CTA	MOU-4848	3,840	403	0	0	0	0	0	0	0	4,243	0.0%		
122015	30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River	PC		B	CTA	CON-105	2,345	398	0	0	0	0	0	0	0	2,743	0.0%		
122016	Downriver Transmission Main Loop	N	2017	B	CTA		0	0	0	297	964	3,051	10,763	22,122	15,075	37,197	2.1%		
132001	Wick PS - Rehabilitation	PC	2004	B	CTA	DWS-858	0	147	0	0	0	0	0	0	0	147	0.0%		
132002	Joy PS - Replace Switchgear	C		B	CTA		669	0	0	0	0	0	0	0	0	669	0.0%		
132003	West Service Center PS - Isolation Gate Valves for Line Pumps	A	2014	DE	CTA		66	147	1,229	96	0	0	0	0	1,325	1,538	0.2%		
132004	North Service Center PS - Hydraulic Surge Control	A	2014	IE	CTA	SCP-CS-054	75	157	0	0	0	0	0	0	0	232	0.0%		
132006	Ford Road PS - Pressure and Control Improvements	A	2014	IE	CTA	CS-1749	8	106	245	1,805	445	0	0	0	2,495	2,609	0.4%		
132007	Imlay PS - Energy Management: Freeze Protection Pump Installation	FP	2014	DE	CTA		0	0	38	385	134	0	0	0	557	557	0.1%		
132008	Various PS's - Needs Assessment Study	A	2014	IE	CTA	SCP-CS-052	33	722	1,178	0	0	0	0	0	1,178	1,933	0.2%		
132009	Study Phase for East Service Center Pump	C	2015	IE	CTA		10	0	0	0	0	0	0	0	0	10	0.0%		
132010	West Service Center PS - Duval Rd Division Valve Upgrades	FP	2017	DE	CTA		0	0	0	2,620	7,430	15,570	8,910	2,606	34,530	37,136	4.8%		
132011	West Service Center - Energy Management: VFD Installation	C	2016	IE	CTA		0	0	0	0	0	0	0	0	0	0	0.0%		
132012	Ypsilanti PS Improvements	N	2017	DE	CTA		0	0	93	606	820	2,594	4,134	900	8,247	9,147	1.2%		
132013	Adams Road Pumping Booster VFD & Gate Valves to Optimize Service Delivery	N		DE	CTA		0	0	0	148	531	531	348	0	1,558	1,558	0.2%		
132014	Adams Road Pumping Booster Pumping & Switch Gear Improvements	N		DE	CTA		0	0	0	0	0	21	1,030	4,625	1,051	5,676	0.1%		
132015	Newburgh BPS - Pumping System & Building Upgrades	N		DE	CTA		0	0	0	607	2,396	2,396	2,396	4,375	7,795	12,170	1.1%		
132016	North Service Center BPS Improvements	N		DE	CTA		0	0	0	0	0	6	4,520	20,394	4,526	24,920	0.6%		

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures							Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total			
132017	North Service Center BPS - On-Site & Off-Site Yard Piping & Valve Replacement	N		DE	CTA		0	0	0	6	2,300	2,506	264	0	5,076	5,076	0.7%	
132018	Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps & Underdrain System	N		DE	CTA		0	0	0	0	10	1,916	2,085	6,553	4,011	10,564	0.6%	
132019	Wick Road BPS - Switchgear, Control Valves & Hydropneumatic Tank Replacement	N		DE	CTA		0	0	0	0	6	1,009	4,555	1,015	5,570	5,570	0.1%	
132020	Franklin BPS - Isolation Gate Valves & Electrical Actuator Improvements	N		DE	CTA		0	0	0	0	846	2,009	7,315	2,855	10,170	10,170	0.4%	
132021	Imlay BPS - Replace VFDs, Pumps, Motors and HVAC	N		DE	CTA		0	0	0	0	0	6	12,103	6	12,109	12,109	0.0%	
132022	Joy Road BPS - Replace Reservoir Pumps, Motors and Isolation Valves	N		DE	CTA		0	0	0	0	0	6	6,103	6	6,109	6,109	0.0%	
132023	Reservoir Inspection, Design & Rehabilitation @ Water Works Park and Northeast Water Treatment Plants; and Wick, Schoolcraft, Northwest, North Service Center, and Michigan Avenue Pumping Stations	N		DE	CTA		0	0	0	0	449	554	18,106	1,003	19,109	19,109	0.1%	
132024	Reservoir Inspection, Design and Rehabilitation @ Adams, East-side, Farmington, Ford Road, Franklin, Haggerty and Joy Road	N		DE	CTA		0	0	0	0	449	554	18,106	1,003	19,109	19,109	0.1%	
161001	Water Master Plan Update	PC	2010	B <sup>2</sup>	CTA		330	0	0	0	0	0	0	0	0	330	0.0%	
170100	Water Treatment Plant / Pump Station Allowance	A	2012	IE	CTA	Various <sup>3</sup>	6,777	1,597	4,296	3,058	3,144	3,000	3,000	15,000	16,498	39,872	2.3%	
170200	As Needed Construction Materials, Environmental Media and Special Testing Services, Construction Inspection, and Other Technical Services	A	2014	DE	CTA	CS-1726	0	172	472	572	572	0	0	0	1,616	1,788	0.2%	
170300	Water Treatment Plant Automation Program	A	2017	IE	CTA	CS-108	13	1,425	61	1,561	1,561	1,561	1,514	105	6,258	7,801	0.9%	

<sup>2</sup> SWIPP Grant/ Bond

<sup>3</sup> CON-153, SCP-SP-009, SCP-CS-1692, SCP-NE-017, CON-225, LH-398, SCP-CS-1656, CS-1738, SCP-DWS-059, CS-1432A, SCP-NE-007, DWS-063, SW-011, CS-1630, CS-187, CS-1674, SCP-CON-094

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures							Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total			
170400	Water Transmission Improvement Program	A	2010	DE	CTA	DBW-070, SCP-DWS-018	1,075	229	1,000	1,500	2,000	2,000	2,000	2,000	8,500	11,804	1.2%	
170500	Transmission System Valve Rehabilitation and Replacement Program	A	2017	DE	CTA	CON-181	0	2,000	4,000	4,000	3,274	726	4,000	4,000	16,000	22,000	2.2%	
170600	Water Transmission Main Asset Assessment Program	FP	2017	IE	CTA		0	2,627	2,501	3,001	4,001	4,001	5,001	5,001	18,505	26,133	2.6%	
170700	Reservoirs Inspection, Repair and Rehabilitation Program	PC	2007	DE	CTA	DWS-874	12,914	1,417	0	0	0	0	0	0	0	14,331	0.0%	
170800	Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SPW-WTP and SW-WTP	A	2016	DE	CTA	CS-151	0	39	472	753	4,510	4,340	4,340	4,645	14,415	19,099	2.0%	
170900	Suburban Water Meter Pit Rehabilitation and Meter Replacement	FP	2014	DE	SO		0	410	4,613	3,690	3,690	3,997	4,100	0	20,090	20,500	2.8%	
171000	LH - WTP Sanitary Survey Improvements	N	2017	IE	CTA		0	0	45	49	49	49	49	247	241	488	0.0%	
171100	NE - WTP Sanitary Survey Improvements	N		IE	CTA		0	6	75	79	79	79	79	399	391	796	0.1%	
171200	SW-WTP Sanitary Survey Improvements	N		IE	CTA		0	0	6	75	79	79	79	399	318	717	0.0%	
171300	WWP - WTP Sanitary Survey Improvements	N		IE	CTA		0	0	45	49	49	49	49	247	241	488	0.0%	
171400	Energy Management Program @ All Water Facilities	N		IE	CTA		0	0	0	0	520	693	693	5,094	1,906	7,000	0.3%	
171500	Roof Replacement - Various Water Facilities	N		DE	CTA		0	0	111	986	210	24	1,159	24,756	2,490	27,246	0.3%	
Total Water Projects							159,620	39,257	63,310	134,515	154,225	176,998	173,492	782,785	702,540	1,684,202	98.6%	
Total Water-budget Centralized Services Budget							1,298	786	2,728	3,068	1,509	1,302	1,682	7,030	10,289	19,403	1.4%	
Total Water budget Projects							160,918	40,043	66,038	137,583	155,734	178,300	175,174	789,815	712,829	1,703,605	100.0%	

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 <sup>(1)</sup>	1931/1958	540
Water Works Park	2003	240

<sup>(1)</sup> 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.

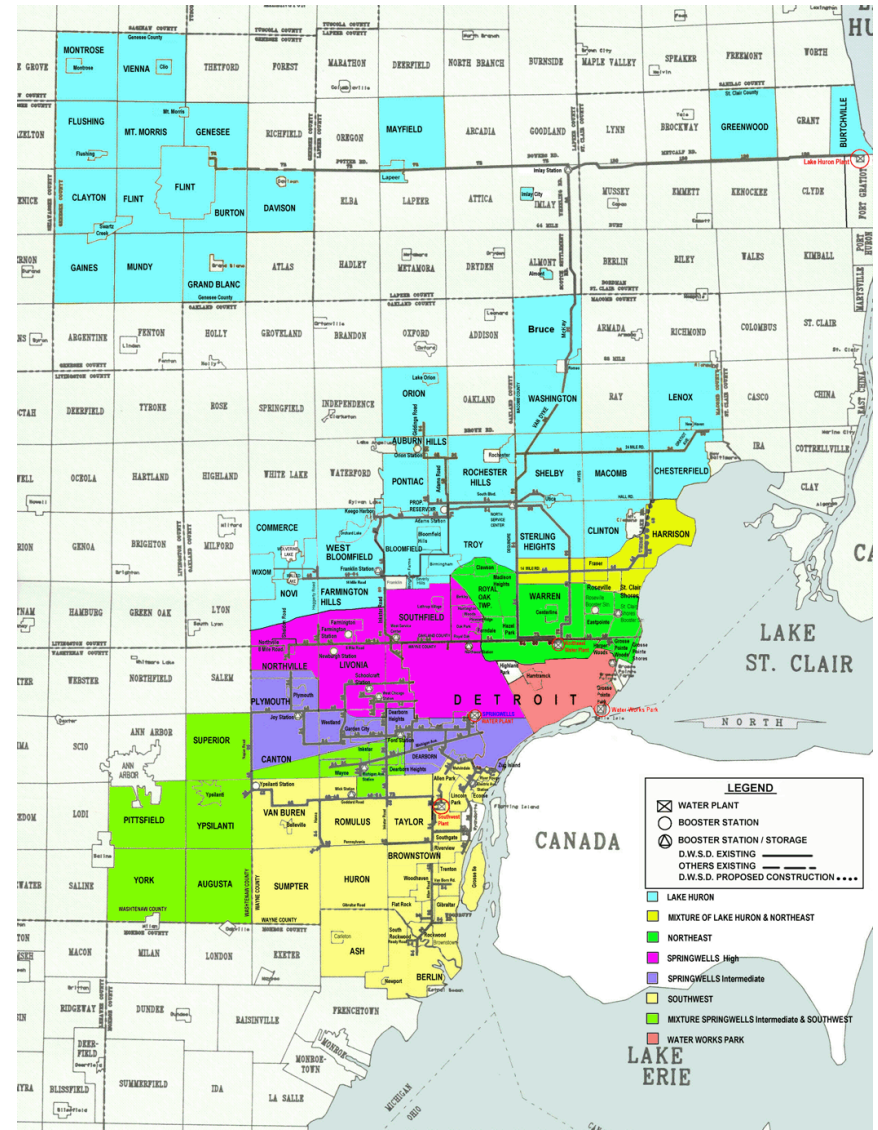
### Service Area and Customers

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
<b>System Totals:</b>		<b>1,720</b>	<b>2,400</b>	<b>192</b>	<b>*IPD = Intermediate Pressure District, HPD = High Pressure District</b>

### 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-3. Lake Huron WTP

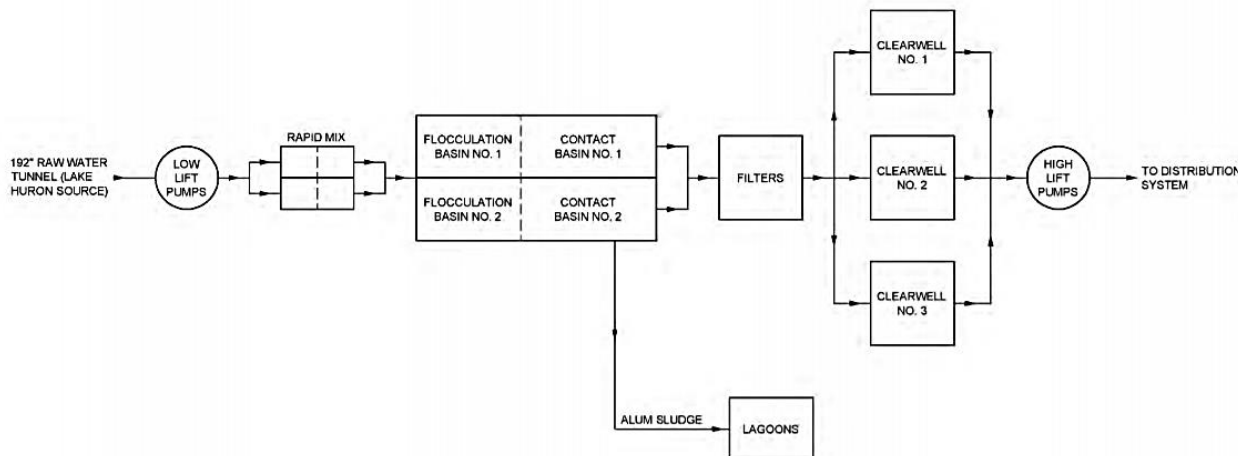


Figure VI-2. Lake Huron WTP process diagram

### 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

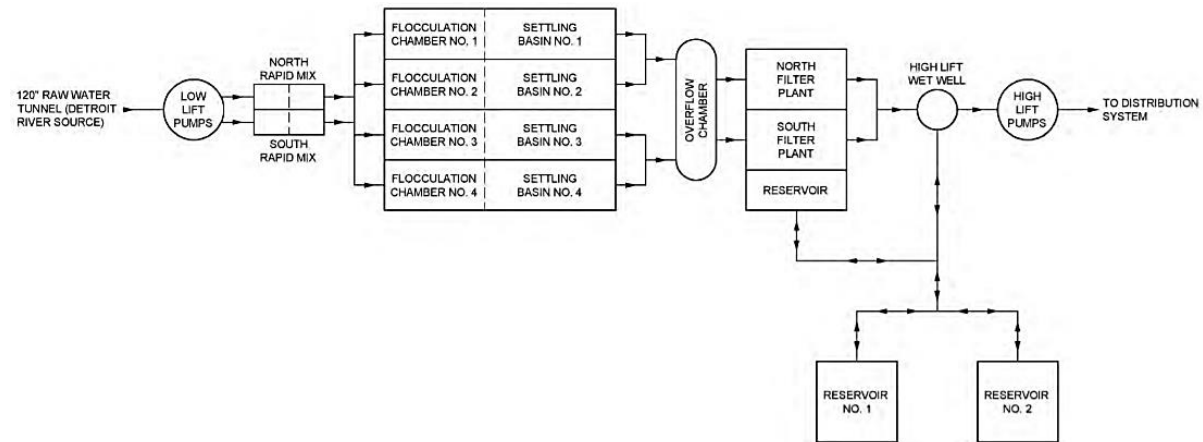


Figure VI-5. Northeast WTP process diagram

### 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

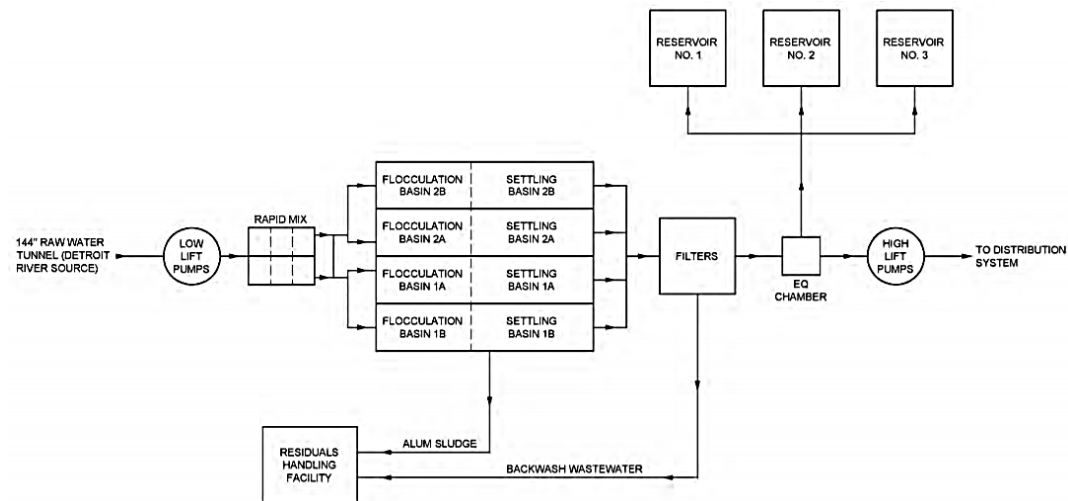


Figure VI-7. Southwest WTP process diagram



### 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

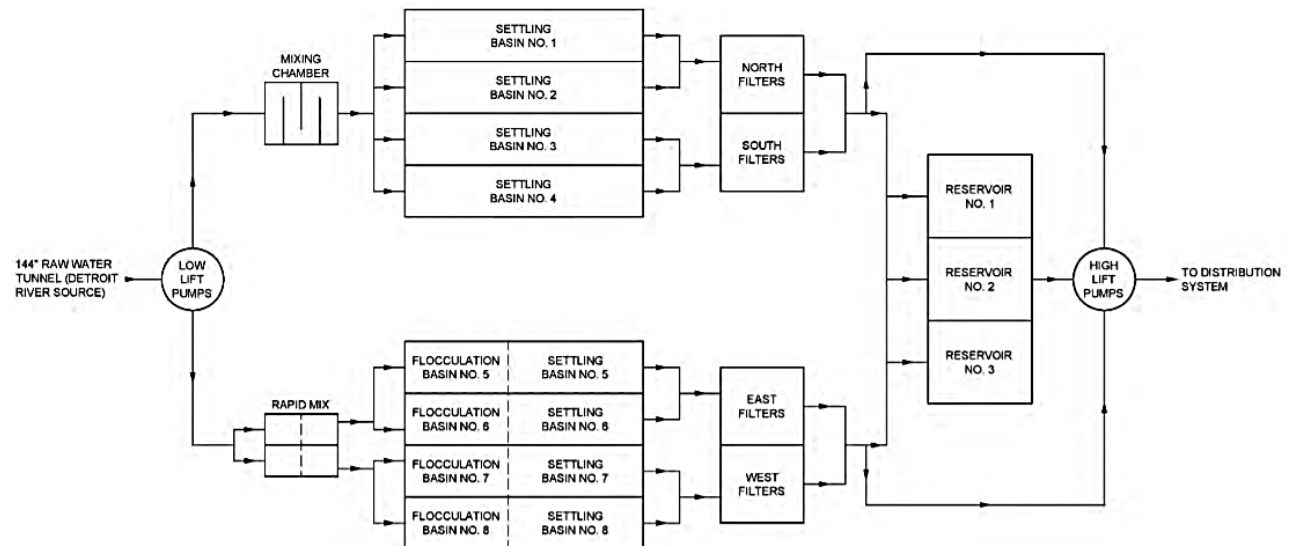


Figure VI-9. Springwells WTP process diagram

### 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.

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-10. Water Works Park WTP

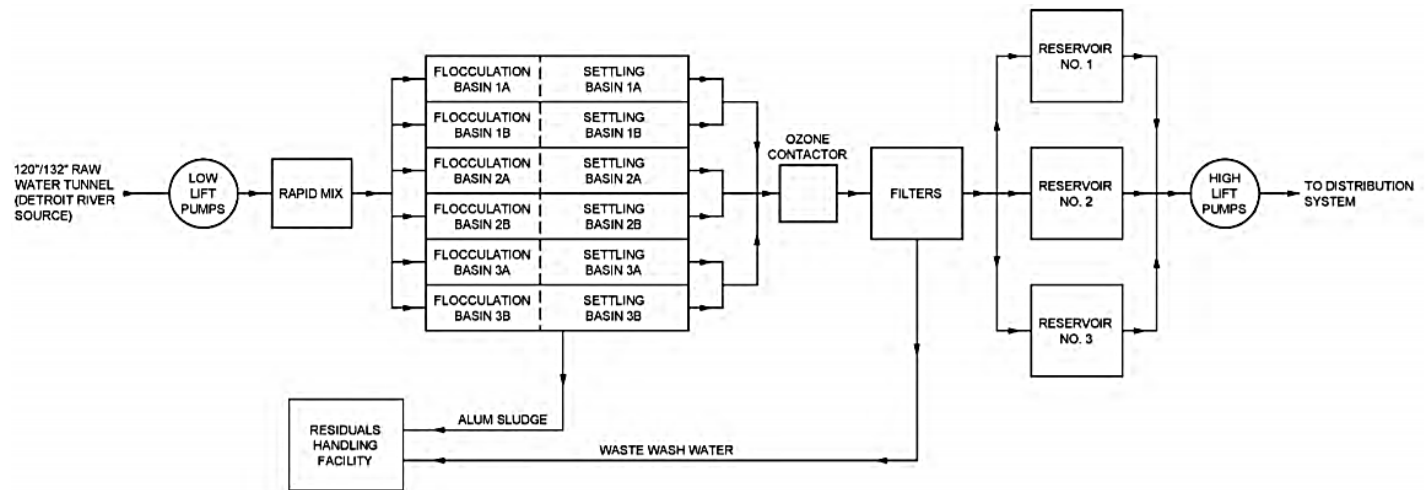


Figure VI-11. Water Works Park process diagram

### 1.1.6. General Purpose

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

### 1.2. Field Services

#### 1.2.1. General Purpose

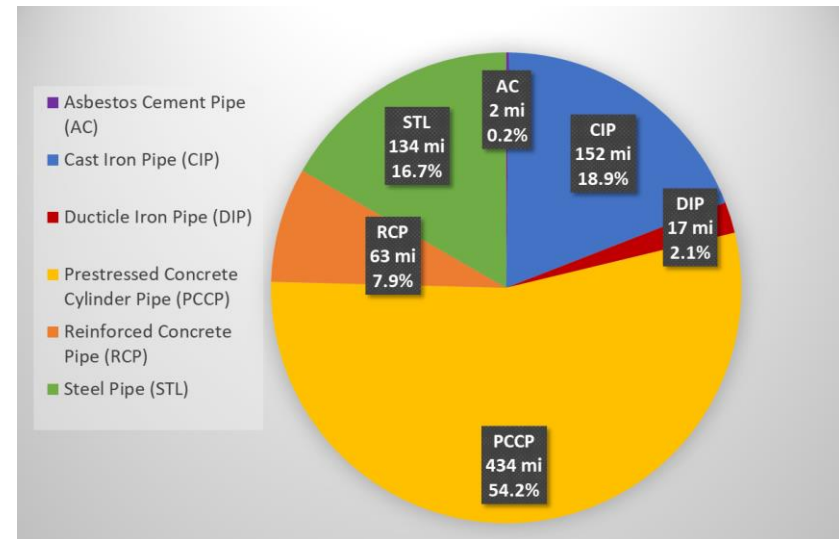
Refer to the General Purpose description on page II-6.

#### 1.2.2. Transmission System

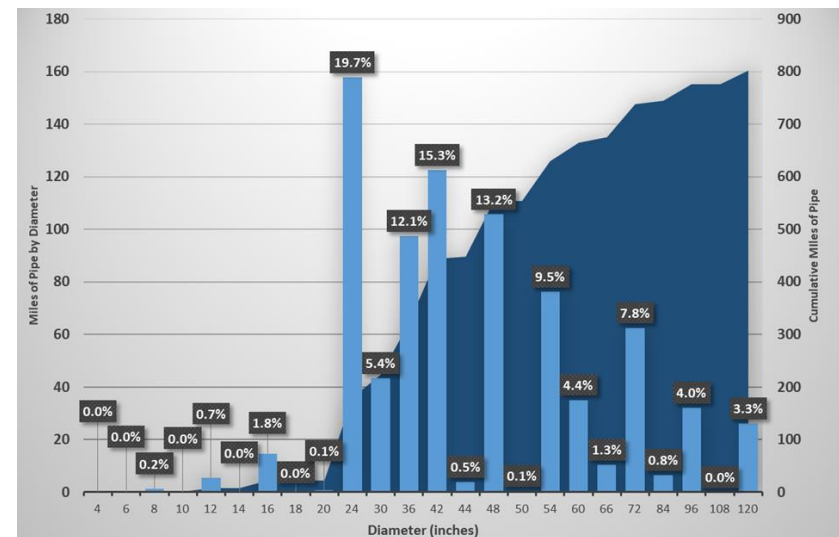
The Regional Water Transmission System (RWTS) consists of approximately 803 miles of water main typically 24-inch and greater with the responsibility for the transport of potable water from the five water treatment facilities to the regional wholesale water customer communities and the City of Detroit.

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.

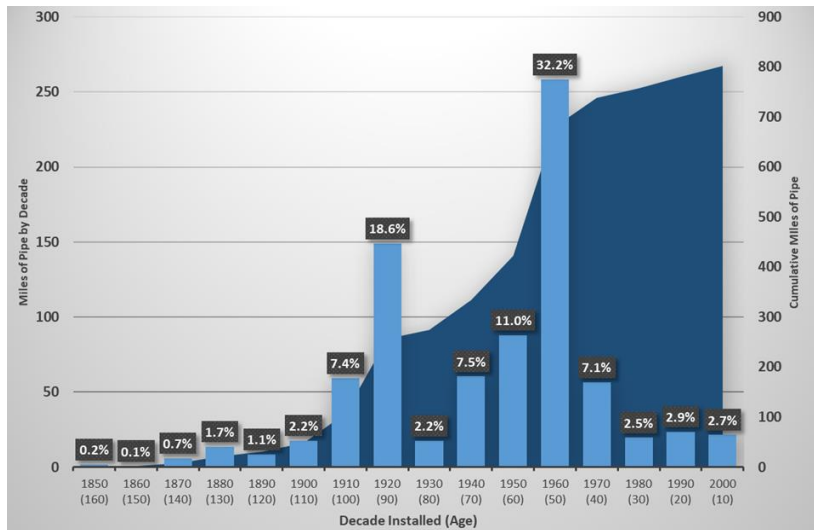
Most of RTWS is Prestressed Concrete Cylinder Pipe (54%), Cast Iron Pipe (19%), and Steel Pipe (17%). The majority of RTWS are typically 24 inches and larger, of which 24 inch (20%), 42 inch (15%), and 48 inch (13%) are the most common diameters; however, some smaller diameter pipe exists on site at 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**

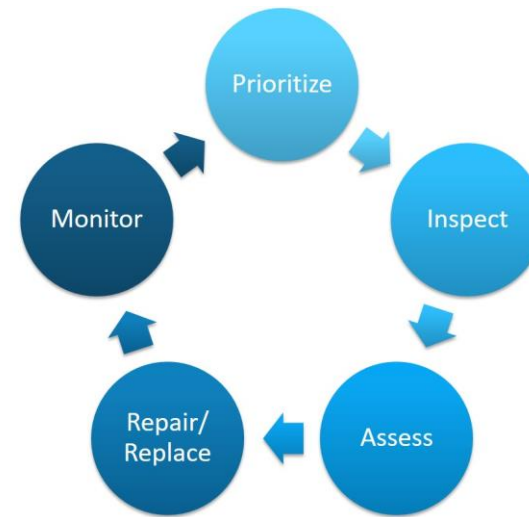


**Figure VI-13. Transmission system inventory by diameter**



**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

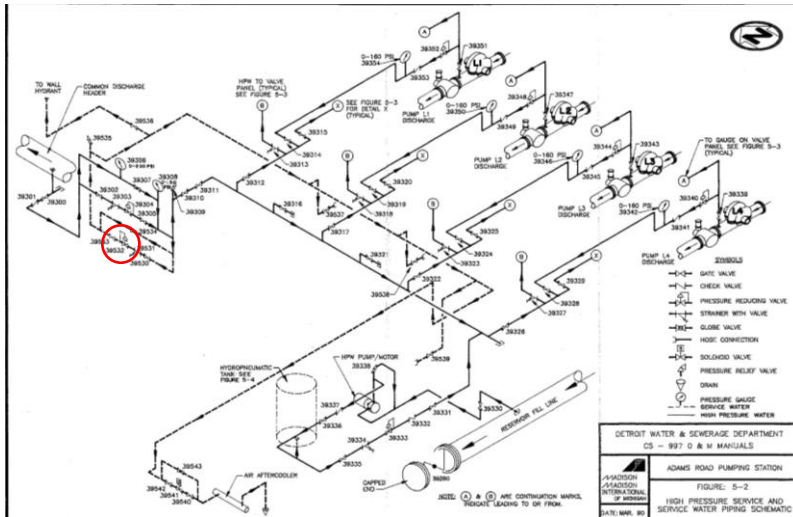
Refer to the General Purpose description on page II-6.

#### Pressure Reducing Valve (PRV)

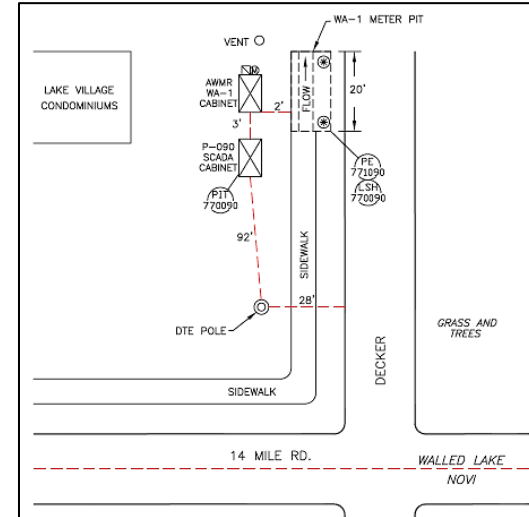
Pressure Reducing Valves (PRV) regulate water pressure at critical locations throughout the Regional Water Transmission System. Pressure reduction is needed to protect portions of the Water System from being impacted by above normal operating pressures. Downstream of the PRVs, pressure is maintained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

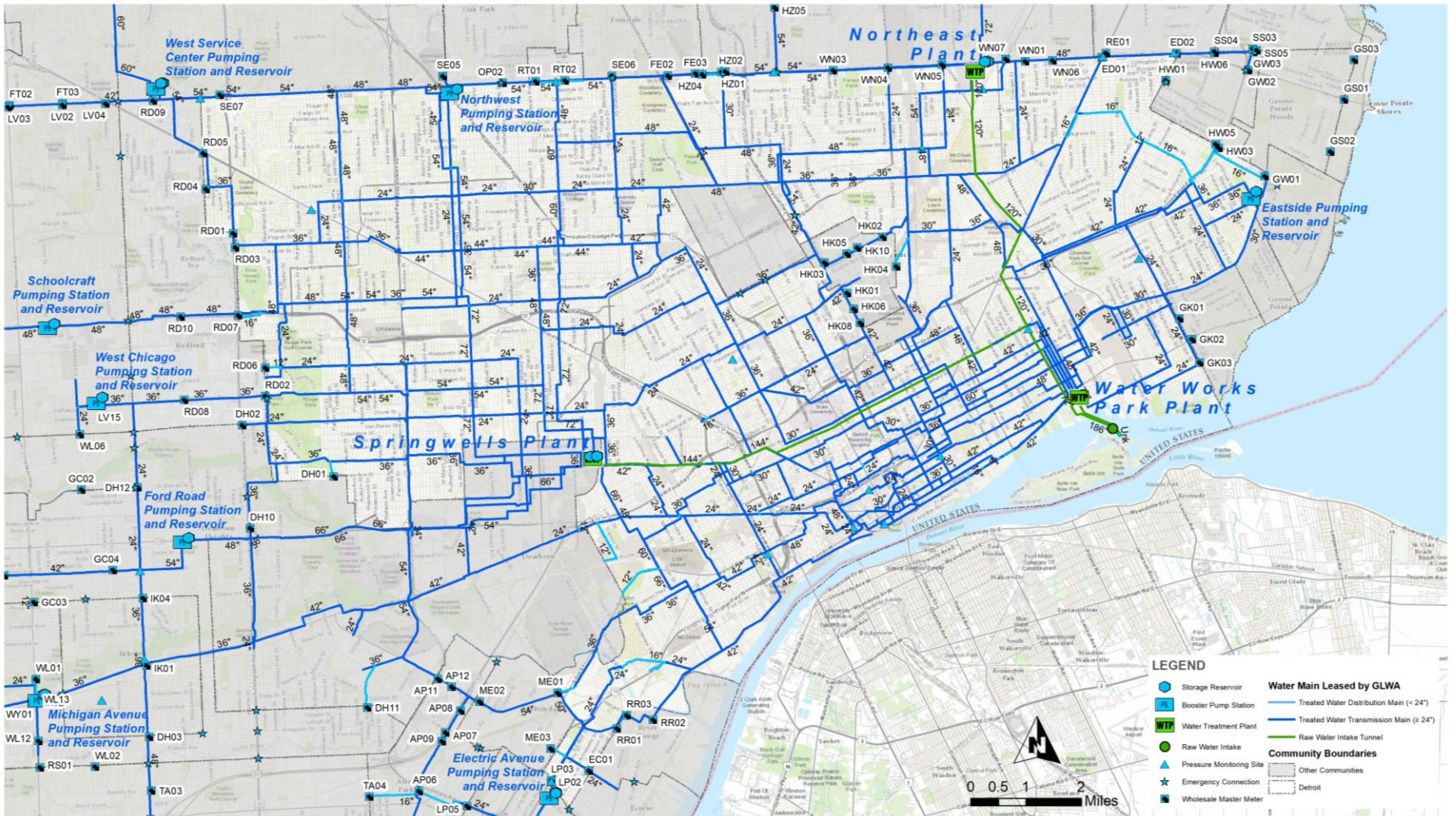


**Figure VI-16. Adams Road Pumping Station: PRVs can be seen throughout drawing. The one circled for example reduces pressure before feeding to service water line.**



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





### GLWA LEASED WATER ASSETS - INSIDE CITY OF DETROIT REGIONAL WATER TRANSMISSION SYSTEM

Notes: Assets depicted on this map are based on the best available data at this time. They may not be completely accurate including spatial representations, leased statuses or attribute values. The user accepts responsibility for accuracy of any referenced information, spatial or otherwise.

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







### 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.

<b>Elevation</b>	881.50
<b>Suction Pressure</b>	40 - 55 psi
<b>Discharge Pressure</b>	120 -150 psi
<b>Reservoir Capacity</b>	10 MG
<b>Reservoir Pumps</b>	R1 - 1500 Hp, 10 MGD, 350 TDH R2 - 1500 Hp, 10 MGD, 350 TDH
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

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

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

<b>Elevation</b>	880.00
<b>Suction Pressure</b>	55 - 100 psi
<b>Discharge Pressure</b>	80 - 105 psi
<b>Reservoir Capacity</b>	10 MG
<b>Reservoir Pumps</b>	R1 - 700 Hp, 14 MGD, 200 TDH R2 - 700 Hp, 14 MGD, 200 TDH
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	618.26
<b>Suction Pressure</b>	35 - 50 psi
<b>Discharge Pressure</b>	75 - 95 psi
<b>Reservoir Capacity</b>	10 MG
<b>Reservoir Pumps</b>	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
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	832.58
<b>Suction Pressure</b>	35 - 60 psi
<b>Discharge Pressure</b>	135 - 155 psi
<b>Reservoir Capacity</b>	10 MG
<b>Reservoir Pumps</b>	R1 - 1570 Hp, 22 MGD, 320 TDH R2 - 1570 Hp, 22 MGD, 320 TDH
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

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

<b>Elevation</b>	686.00
<b>Suction Pressure</b>	35 - 55 psi
<b>Discharge Pressure</b>	130 - 150 psi
<b>Reservoir Capacity</b>	2 X 5 MG
<b>Reservoir Pumps</b>	R1 - 1200 Hp, 16.13 MGD, 332 TDH R2 - 1200 Hp, 16.13 MGD, 332 TDH R3 - 1250 Hp, 14.8 MGD, 332 TDH
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	787.87
<b>Suction Pressure</b>	65 - 95 psi
<b>Discharge Pressure</b>	85-w/-75-170-s psi
<b>Reservoir Capacity</b>	18 MG
<b>Reservoir Pumps</b>	R1 - 5250 Hp, 75 MGD, 335 TDH R2 - 5250 Hp, 75 MGD, 335 TDH
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	737.00
<b>Suction Pressure</b>	30 - 60 psi
<b>Discharge Pressure</b>	110 - 130 psi
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	657.00
<b>Suction Pressure</b>	
<b>Discharge Pressure</b>	40-55 psi
<b>Reservoir Capacity</b>	10 MG
<b>Reservoir Pumps</b>	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
<b>Electric Feeds</b>	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 area 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.

<b>Elevation</b>	697.70
<b>Suction Pressure</b>	30 - 50 psi
<b>Discharge Pressure</b>	135 - 150 psi
<b>Reservoir Capacity</b>	2 X 10 MG
<b>Reservoir Pumps</b>	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
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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 through 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 through the 30-inch water main running along Giddings Road and serves the Orion area.

<b>Elevation</b>	946.25
<b>Suction Pressure</b>	75 - 95 psi
<b>Discharge Pressure</b>	105 - 130 psi
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	687.00
<b>Suction Pressure</b>	65 - 95 psi
<b>Discharge Pressure</b>	75 - 140 psi
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

<b>Elevation</b>	646.89
<b>Suction Pressure</b>	35 - 50 psi
<b>Discharge Pressure</b>	110 - 140 psi
<b>Reservoir Capacity</b>	2 X 10 MG
<b>Reservoir Pumps</b>	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
<b>Line Pumps</b>	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
<b>Electric Feeds</b>	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.

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

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

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

<b>Elevation</b>	703.90
<b>Suction Pressure</b>	30 - 60 psi
<b>Discharge Pressure</b>	110 - 130 psi
<b>Line Pumps</b>	L1 - 1000 Hp, 18 MGD, 250 TDH, VFD L2 - 1000 Hp, 18 MGD, 250 TDH, VFD L3 - 1000 Hp, 18 MGD, 250 TDH, VFD
<b>Electric Feeds</b>	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). The Project Status column shows which projects are Active (A), New this year (N), Future Planned (FP), Closed or Cancelled (C), Pending Closeout (PC), or have been Reclassified to a different number (R). In the Capital Expense Category (CapEx Category), projects may be Debt Eligible (DE) or funded with Bonds (B) or the Improvement & Extension Fund (IE), or the State Revolving Fund (SRF). 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	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures								2019-2023 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	A	1999	SRF	CTA	PC-757	10,243	12,983	16,107	8,671	6,033	0	0	0	30,811	54,037	4.9%	
211002	WRRF PS No. 2 Pumping Improvements - Phase 1	A	2003	SRF	CTA	CS-1444, PC-795	109	599	2,454	621	0	0	0	0	3,075	3,783	0.5%	
211003	WRRF Rehabilitation of Primary Clarifiers	A	2006	DE	CTA	CS-1484	1,702	272	201	56	0	0	0	0	257	2,231	0.0%	
211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements	A	2008	DE	CTA	PC-789	20,944	3,648	2,752	303	0	0	0	0	3,055	27,647	0.5%	
211005	WRRF PS No. 2 Improvements Phase II	A	2014	DE	CTA	CS-130	0	7	0	515	115	9,294	9,101	3,055	19,025	22,087	3.0%	
211006	WRRF PS No. 1 Improvements	FP	2016	DE	CTA		0	0	500	1,800	2,462	9,394	9,245	719	23,401	24,120	3.7%	
211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements	FP	2016	DE	CTA		0	0	7	402	1,980	2,404	6,956	8,814	11,749	20,563	1.9%	
211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines	FP	2017	DE	CTA		0	0	7	115	1,259	2,732	5,537	2,363	9,650	12,013	1.5%	
211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System	FP	2017	DE	CTA		0	0	0	7	859	572	5,796	5,005	7,234	12,239	1.1%	
212001	WRRF Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Secondary Clarifiers	PC	2005	B	CTA	PC-776	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	PC	2006	B	CTA	CS-1448	10,819	0	0	0	0	0	0	0	0	10,819	0.0%	

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	Projected Expenditures							2019-2023 CIP Total	Project Total	Percent of W/S CIP
									FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond				
212003	WRRF Aeration System Improvements	A	2008	SRF	CTA	PC-796, CS-157	3,805	9,273	2,719	2,523	0	0	0	0	5,242	18,320	0.8%	
212004	WRRF Chlorination and Dechlorination Process Equipment Improvements	FP	2010	DE	CTA		86	0	2,101	2,422	661	0	0	0	5,184	5,270	0.8%	
212005	WRRF Rouge River Outfall No. 2 (RRO-2) Segment 1	PC	2011	SRF	CTA	PC-786	252	0	0	0	0	0	0	0	0	252	0.0%	
212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	A	2014	SRF	CTA	CS-1781, PC-797	6,873	20,619	15,817	4,157	0	0	0	0	19,974	47,466	3.2%	
212007	WRRF Rehabilitation of the Secondary Clarifiers	FP	2017	DE	CTA		0	0	0	859	1,374	3,680	9,216	19,676	15,129	34,805	2.4%	
212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)	N	2017	DE	CTA		0	0	0	230	1,141	6,569	5,767	6,809	13,707	20,516	2.2%	
213001	WRRF Replacement of Belt Filter Presses for Complex I and Upper Level Complex II	PC	2006	B	CTA	PC-787, CS-1483	36,669	0	0	0	0	0	0	0	0	36,669	0.0%	
213002	WRRF Rehabilitation of Central Offload Facility	A	2010	SRF	CTA	CS-1701	202	665	6,447	7,520	4,579	0	0	0	18,546	19,413	2.9%	
213003	WRRF Sewage Sludge Incinerator Air Quality Improvements	PC	2012	SRF	CTA	PC-791	50,635	459	0	0	0	0	0	0	0	51,094	0.0%	
213004	WRRF Biosolids Dryer Facility	PC	2012	SA WL/SRF	CTA	PC-792	2,024	193	23	0	0	0	0	0	23	2,240	0.0%	
213005	WRRF Complex I Incinerators Decommissioning and Reusability	FP	2014	DE	CTA		0	0	0	0	161	1,221	2,352	1,171	3,734	4,905	0.6%	
213006	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities	FP	2016	DE	CTA		4	0	0	57	275	2,391	1,130	0	3,853	3,857	0.6%	
213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	A	2016	DE	CTA	CON-197	0	567	6,787	11,356	3,477	0	0	0	21,620	22,187	3.4%	
213008	WRRF Rehabilitation of the Ash Handling Systems	FP	2017	DE	CTA		0	0	0	687	916	3,614	6,069	9,330	11,286	20,616	1.8%	
213009	WRRF Phosphorous Recovery Evaluation	C	2017	DE	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	FP	2014	DE	IWC		182	0	4,001	7,764	1,000	0	0	0	12,765	12,947	2.0%	
216001	Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements	PC	1998	B	CTA	PC-783	31,636	1,033	0	0	0	0	0	0	0	32,669	0.0%	



CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures						2019-2023 CIP Total	Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond				
216002	Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements	PC	2004	B	CTA	PC-782, CS-1443	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	FP	2010	DE	CTA		312	40	551	3,957	565	0	0	0	5,073	5,425	0.8%	
216005	Rehabilitation of the Main Plant Maintenance Building & Other Maintenance Areas and Improvement of Work Environment	C	2011	DE	CTA		0	0	0	0	0	0	0	0	0	0	0.0%	
216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station	FP	2017	B	CTA		0	0	0	1,718	4,008	7,174	17,530	24,026	30,430	54,456	4.8%	
216007	DTE Primary Electric 3rd Feed Supply to WRRF	FP	2017	DE	CTA		15	0	2,002	1,326	3,326	0	0	0	6,654	6,669	1.1%	
222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	FP	2014	B	CTA		0	0	0	10	1,372	5,961	10,292	20,365	17,635	38,000	2.8%	
222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	A	2016	IE	CTA	Con-183	5	2,232	1,084	8,052	10,187	10,187	10,187	2,491	39,697	44,425	6.3%	
222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	FP	2016	IE	OMI D		0	0	0	0	11,000	12,000	3,000	0	26,000	26,000	4.1%	
222004	Collection System Valve Remote Operation Structure Improvements	FP	2017	IE	CTA		0	341	1,019	1,014	0	0	0	0	2,033	2,374	0.3%	
222005	Collection System Access Hatch Improvements	A	2017	DE	CTA		0	341	1,000	1,422	0	0	0	0	2,422	2,763	0.4%	
222007	NIEA Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.	FP	2017	B	CTA		0	0	4	760	3,295	5,689	5,689	5,566	15,437	21,003	2.4%	
232001	Fairview Pumping Station - Replace Four Sanitary Pumps	A	2011	B	CTA	CS-1747	778	508	12,094	14,414	3,974	0	0	0	30,482	31,768	4.8%	
232002	Freud & Conner Creek Pump Station Improvements	A	2016	DE	CTA	Various <sup>4</sup>	2,101	1,384	1,192	0	223	1,582	11,000	15,000	13,997	32,482	2.2%	
232003	Northeast Pumping Station	FP	2016	IE	OMI D		0	0	0	0	2,408	10,920	13,000	0	26,328	26,328	4.2%	
233001	Collection System Backwater Gates and Regulator Gates Rehabilitation	R	2017	IE	CTA		0	0	0	0	0	0	0	0	0	0	0.0%	
233002	Collection System In System Storage Devices (ISDs) Improvement	FP	2017	IE	CTA		0	86	82	382	2,000	1,000	0	0	3,464	3,550	0.5%	

<sup>4</sup> PO-3785, PO-3786, PO-3784, CS-120, CON-109, PO-3783

CIP #	Title	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (unaudited)	FY 2018	FY 2019	Projected Expenditures						2019-2023 CIP Total	Project Total	Percent of W/S CIP
										FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond				
251002	Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade	FP	2017	DE	CTA		0	0	877	2,653	7,012	3,506	0	0	14,048	14,048	2.2%	
260100	WRRF, Lift Station and Wastewater Collection System Structures Allowance	A	2012	IE	CTA	Various <sup>5</sup>	14,758	2,195	1,100	1,100	2,200	2,200	2,200	0	8,800	25,753	1.4%	
260200	Sewer and Interceptor Rehabilitation Program	A	2013	IE	CTA	Various <sup>6</sup>	3,397	7,751	10,601	10,400	11,400	11,400	11,400	11,400	55,201	77,749	8.7%	
260300	Scheduled Replacement Program of Critical Assets	A	2016	IE	CTA	CON-143, SCP-CON-127	56	2,172	0	0	2,200	2,200	2,200	2,200	6,600	11,028	1.0%	
260400	Sewage Meter Design, Installation, Replacement and Rehabilitation Program	A	2014	DE	CTA	CON-179	0	500	1,700	1,700	1,700	1,000	1,000	1,000	7,100	8,600	1.1%	
260500	CSO Outfall Rehabilitation	FP	2017	DE	CTA		0	0	507	3,826	10,001	10,001	10,001	10,001	34,336	44,337	5.4%	
260600	CSO Facilities Improvement Program	A	2017	DE	83/17	Various <sup>7</sup>	764	1,658	9,277	6,218	2,351	4,351	9,351	11,251	31,548	45,221	5.0%	
Total Wastewater Projects							233,311	69,526	103,013	109,017	105,514	131,042	168,019	160,242	616,605	1,079,684	97.4%	
Total Wastewater-budget Centralized Services Budget							1,715	1,106	2,170	2,138	6,438	5,369	439	2,186	16,554	21,561	2.6%	
Total Water budget Projects							235,026	70,632	105,183	111,155	111,952	136,411	168,458	162,428	633,159	1,101,245	100.0%	

<sup>5</sup> SCP-PC-010, SCP-PC-014, SCP-PC-016G, DWS-065, SCP-PC-015

<sup>6</sup> CS-168, CS-068, PO-005030, CON-149

<sup>7</sup> CON-144, CS-145, DWS-065, CS-172, CS-116, CON-234

## 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

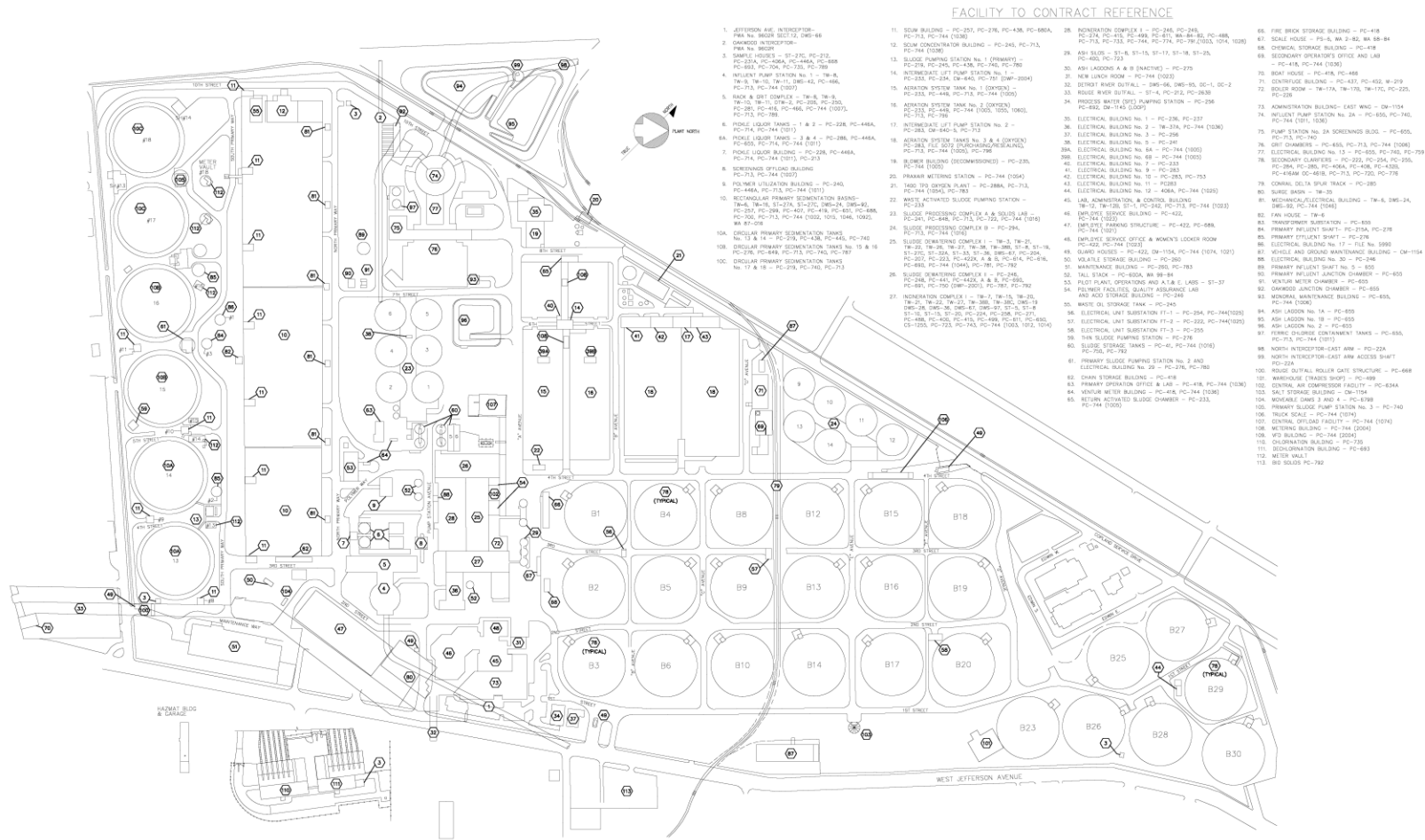


Figure VI-39. Water Resource Recovery Facility Layout

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-51.

### 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.

**Table VI-5. Flow and Treatment Capacity of GLWA CSO RTBs<sup>b</sup>**

	Hubbell- Southfield	Seven Mile	Puritan-Fenkell	Conner Creek	Oakwood
<b>Year of Startup</b>	2000	1999	1999	2005	2012
<b>Drainage Area (Acres)<sup>a</sup></b>	14,440	463	649	83,000	1,500
<b>Retention Volume (MG)</b>	22	2.2	2.8	30	9.0
<b>In-System Storage (MG)<sup>b</sup></b>	4.4	1.9	2.5	32	0
<b>Peak Flow Rates (cfs)</b>	3,200	656	845	13,962	1,660
<b>Compartments</b>	2	2	2	4	2
<b>Sanitary Pump Station</b>	No	No	Yes	No	Yes
<b>Influent</b>	Gravity	Gravity	Gravity	Gravity	Pumped
<b>Effluent</b>	Gravity				
<b>Dewatering</b>	Gravity / Pumped	Pumped	Gravity / Pumped	Pumped	Gravity / Pumped
<b>Screening</b>	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)
<b>Odor Control</b>	Horizontal Wet Scrubber with Sodium Hypochlorite	Vertical Wet Scrubber with Sodium Hypochlorite		Carbon Absorption	
<b>Flushing</b>	Flushing Nozzles	Tipping Buckets		Flushing Gates	
<b>Ventilation</b>	Forced-Air				
<b>Disinfection</b>	Sodium Hypochlorite				
<b><sup>a</sup> 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>					
<b><sup>b</sup> Tributary upstream wet weather flow volume also captured and drained to basin during events and subsequently dewatered.</b>					

## CONNER CREEK CSO RTB



**Figure VI-40. 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-41. 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-42. 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-43. 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-44 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
<b>In Service Date</b>	2007	2002	2002
<b>Peak Hydraulic Capacity</b>	5,700 cfs	2,000 cfs	310 cfs
<b>Toward Treatment Capacity</b>	Not Applicable	150 cfs	Not Applicable
<b>Screening Capacity</b>	5,100 cfs	1,550 cfs	250 cfs
<b>Disinfection Capacity (10 minute contact)</b>	5,100 cfs	1,550 cfs	250 cfs
<b>Dewatering Capacity</b>		Static Volume in 24 hours	Static Volume in 24 hours
<b>Total Disinfection Volume</b>		225 MG	98 MG

## BABY CREEK SCREENING AND DISINFECTION FACILITY



**Figure VI-45. 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-46. 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-47. 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.

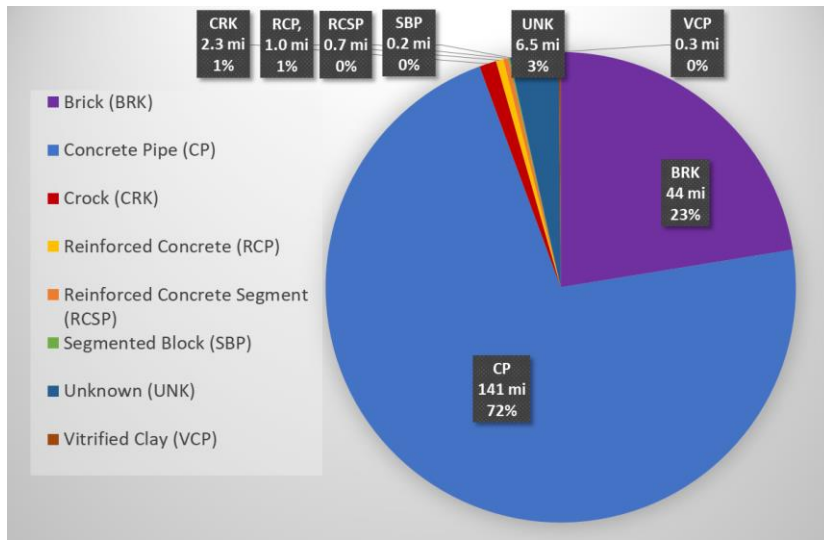
The RWCS is comprised of approximately 195 miles of sewer mains. Approximately 184 miles of the mains are considered

“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-51, 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.

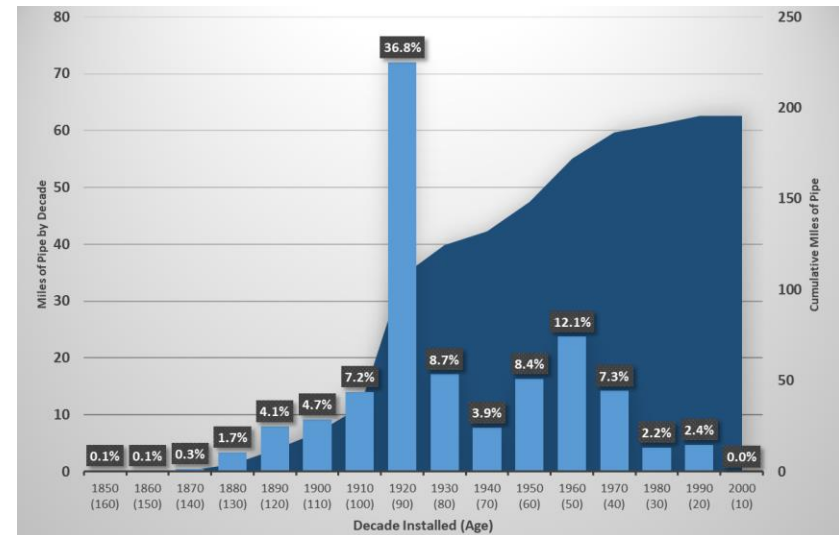
Figure VI-48, Figure VI-49, and Figure VI-50 depict the collection system inventory by material, diameter, and decade installed/age, respectively. The collection system ranges from 12 to 348 inch in diameter with an average age of 76 years.

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%).

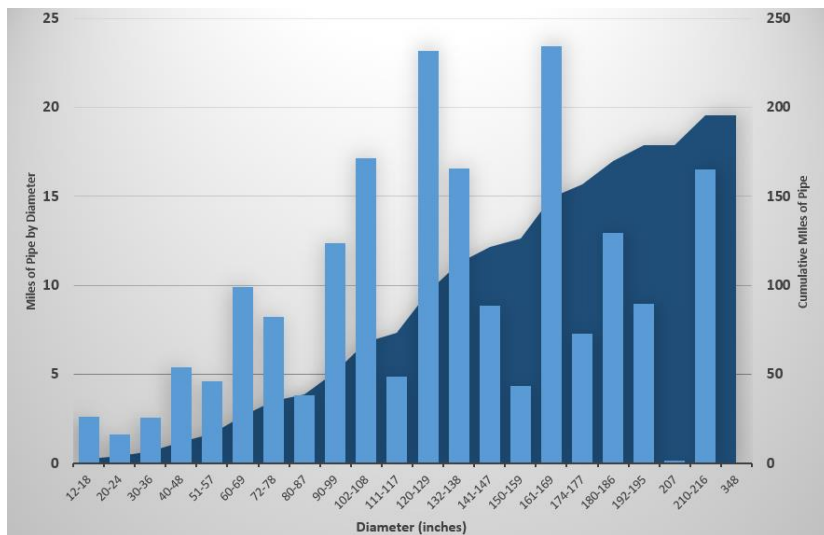
In recent history, a condition inspection of the Detroit River Interceptor and Outfalls was performed in 2012. A prioritized condition assessment and renewal program has been underway since 2016 on the collection system gravity mains. This effort was initiated to address the aging collection system infrastructure 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-48. Collection system inventory by material**



**Figure VI-50. Collection system inventory by decade installed / age**

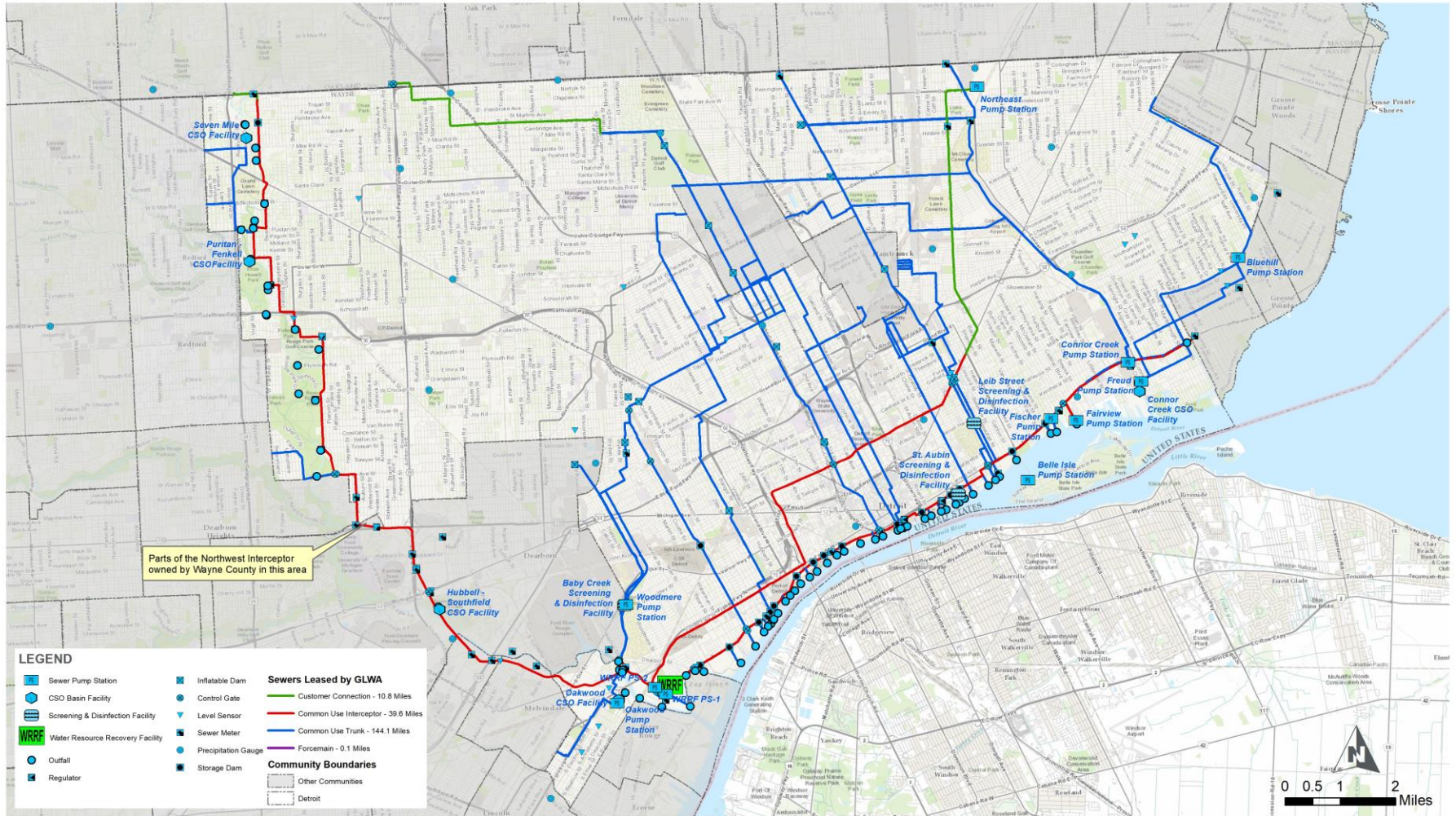


**Figure VI-49. Collection system inventory by diameter / height**

Figure VI-51 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.





### GLWA LEASED SEWER ASSETS COLLECTION SYSTEM

Notes: Assets depicted on this map are based on the best available data at this time. They may not be completely accurate including spatial representations, leased statuses or attribute values. The user accepts responsibility for accuracy of any referenced information, spatial or otherwise.

Figure VI-51. 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 <sup>1</sup>
6 Mile Sewer	Trunk	5.0	9'-10.5'	Concrete / Brick	DRI	1921	1927	96	90	93	9/2017
6 Mile Sewer East	Trunk	0.4	10.5'	Concrete	DRI	1921	-	96	-	96	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	5.5'-11.5'	Concrete	DRI & NIEA	1921	1924	96	93	95	8/2017
7 Mile Sewer West	Trunk	0.8	9.25'	Brick	O-NWI	1931	-	86	-	86	10/2017
7 Mile Sewer West Relief	Trunk	0.7	10'	Concrete	DRI & NIEA	1965	1967	52	50	51	-
7 Mile Sewer East Relief	Trunk	3.2	9'-13.75'	Concrete	DRI	1960	1962	57	55	56	10/2017
8 Mile-Centerline Sewer / Connors Ave. Arm	Trunk	0.7	1.5'-8.5'	Concrete / Brick / Unknown	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	4.3	3'	Concrete	O-NWI	1938	-	79	-	79	-
Baby Creek (Wet Weather Line)	Trunk/CSO Storage	4.3	14.5'x17.5'	Concrete	N/A - Rouge River, Miller Rd Gate Outfall	1962	-	55	-	55	-
Bates St. Sewer	Trunk	5.4	1'-13.5' 3'x4.5' (Box)	Concrete / Brick / Clay / Unknown	DRI	1922	-	95	-	95	9/2017 to 10/2017
Berg Sewer	Customer Connection	0.1	1.75'	Concrete / Brick	O-NWI	1929	-	88	-	88	9/2017 to 10/2017
Clark Sewer, Morell St. Sewer, Extension to Morrell, Tuxedo Ave. Sewer	Trunk	8.2	5'-14'	Concrete / Brick / Unknown	DRI	1912	1923	105	94	100	8/2017
Conant-Mt. Elliot Relief Sewer	Trunk	8.2	10.5'-16.25'	Concrete	DRI & NIEA	1954	1957	63	60	62	9/2017 to 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 <sup>1</sup>
Connors Creek Enclosure	Trunk	11.5	12'x17.5' (Box) 12.9'x17.5' (Box)	Concrete / Brick	DRI	1922	1928	95	89	92	9/2016 to 9/2017
Dequindre Interceptor	Trunk	0.9	9'	Concrete	DRI & NIEA	1970	-	47	-	47	-
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	6'-16'	Concrete / Brick	WRRF	1913	1939	104	78	91	07/2012 to 10/2016
East Jefferson Relief Sewer	Trunk	1.1	14'	Concrete	DRI	1927	-	90	-	90	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	8/2017 to 10/2017
Evergreen-Farmington Connection	Customer Connection	4.8	8'	Concrete	DRI & NIEA	1991	-	26	-	26	-
First-Hamilton Relief Sewer	Trunk	8.8	7'-15.5' 2.7'x4' - 10'x10.5' (Box)	Concrete	DRI & NIEA	1956	1970	61	47	54	8/2017 to 10/2017
Fisher Ave. Storm Sewer	Trunk	0.5	10.5'x13.75'	Concrete	DRI / Detroit River	1928	1965	89	52	71	-
Fort Street Sewer	Trunk	2.7	2'-10'	Concrete / Crock / Brick / Segmented Block	O-NWI	1924	1939	93	78	86	-
Fox Creek Relief Sewer, Cadieux Road Sewer	Trunk	4.0	9.25'-16'	Concrete	DRI	1923	1953	94	64	79	-
Jos. Campau Sewer	Trunk	5.0	3.5'-11.5'	Concrete / Brick	DRI	1921	1957	96	60	78	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 <sup>1</sup>
Joy Road Sewer, Highland Park Sewer - Edison Ave. Arm, Highland Park Arm	Trunk	4.1	8.25'-14'	Concrete / Brick	DRI & NIEA & O-NWI	1922	1975	95	42	69	9/2017
Linwood Ave. Sewer, Lateral Sewer - Puritan & Linwood - Puritan Ave. Arm	Trunk	3.1	1.25'-9.5' 3'x4.5' (Box) 3.3'x5' (Box)	Concrete / Brick / Clay	DRI	1919	1921	98	96	97	9/2017
Livernois Relief Sewer	Trunk	5.0	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, Chrysler Freeway Davison Sewer Alterations, Connor Creek Connection	Trunk	4.9	5.5'-11.5'	Concrete / Brick	DRI	1920	1975	97	42	70	7/2017
Mack Avenue Relief Sewer	Trunk	2.2	9.25'-14'	Concrete	DRI	1967	-	50	-	50	11/2016
Mt. Elliot Ave. Sewer, Miller Road Sewer, Carrie Ave. Relief, and Laterals	Trunk	6.4	1.25'-9'	Crock / Brick	DRI	1913	1930	104	87	96	10/2017
North Interceptor East Arm (NIEA) - Upper Portion, Northeast SPS to Gratiot	Interceptor	6.4	12'-17.5'	Concrete	WRRF & DRI	1971	1974	46	43	45	7/2015 to 8/2015
North Interceptor East Arm (NIEA) - Lower Portion, Gratiot to WRRF	Interceptor	9.6	12'-13.5'	Concrete	WRRF & DRI	1974	1981	43	36	40	-
Oakland-Northwest Interceptor (O-NWI)	Interceptor	17.3	4'-13.5'	Concrete	WRRF	1928	1950	89	67	78	3/2017 to 7/2017
Palmer Sewer, McDougall Ave. Sewer, Grandy Ave. Sewer	Trunk	2.5	5.5'-6' 2.5'x3.33' (Box) 3.67'x5.5' (Box) 4'x6' (Box)	Concrete / Brick	DRI	1885	1916	132	101	117	8/2017

Sewer Name	Type	Length (miles)	Size	Material	Drains to Interceptor	Years Constructed (year - year)		Age Range (years - years)		Average Age	Inspection Month / Year <sup>1</sup>
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	-	-	-	-
Telegraph Sewer, Puritan-Telegraph Sewer, Farmington Ave. Arm Section 1	Trunk	2.2	4.25'-10.25'	Concrete / Brick	O-NWI	1930	-	87	-	87	8/2017
Third Ave. Sewer, Second Ave. Relief, Hamilton-Woodward-Webster, Village of Highland Park Sewer	Trunk	4.2	1'-11' 2.5'x3.75' (Box) 3'x4.5' (Box)	Concrete / Crock / Brick	DRI & NIEA & O-NWI	1898	1931	119	86	103	8/2017 & 10/2017
Tireman Parkland Sewer, Warren Ave. Sewer	Trunk	1.5	1.25'-7.5'	Concrete	O-NWI	1946	1949	71	68	70	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	6'-14'	Brick / 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 Sewer, Chrysler Exp., Fischer Freeway Alterations, Civic Center Plaza, et al.	Trunk	6.7	5.25'-13.75' 3'x4.5' (Box)	Concrete / Brick	DRI	1890	1975	127	42	85	-
Wyoming Ave. Sewer, Wyoming Relief Sewer	Trunk	0.8	1.66'-29'	Brick / Concrete	O-NWI	1923	1966	94	51	73	9/2017

<sup>1</sup> 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

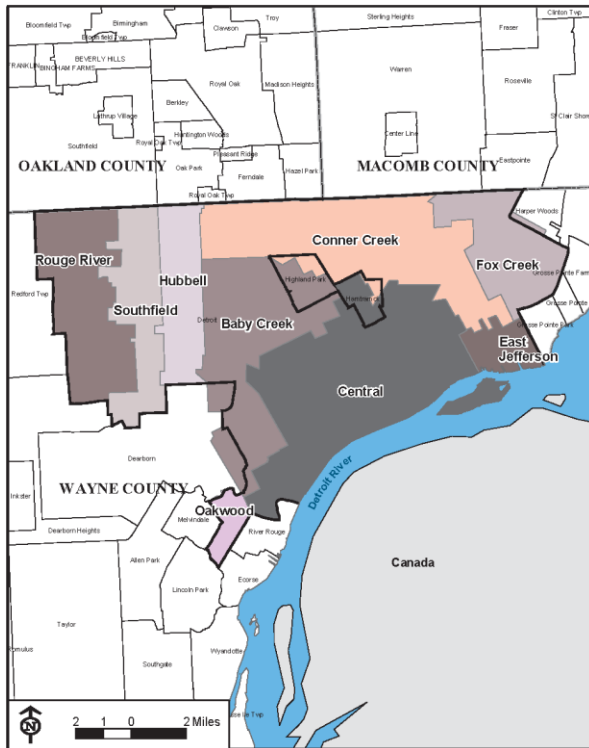


Figure VI-52. Sewer districts within Detroit

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

### GLWA Regional Sewer Districts

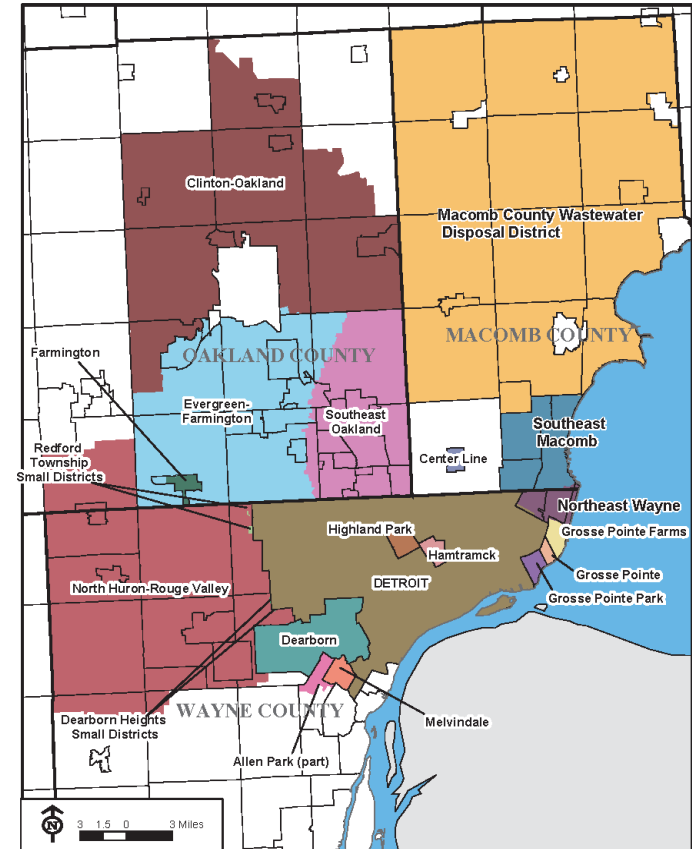


Figure VI-53. Sewer districts served by GLWA



## 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

County/ City	District	Communities
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-54.

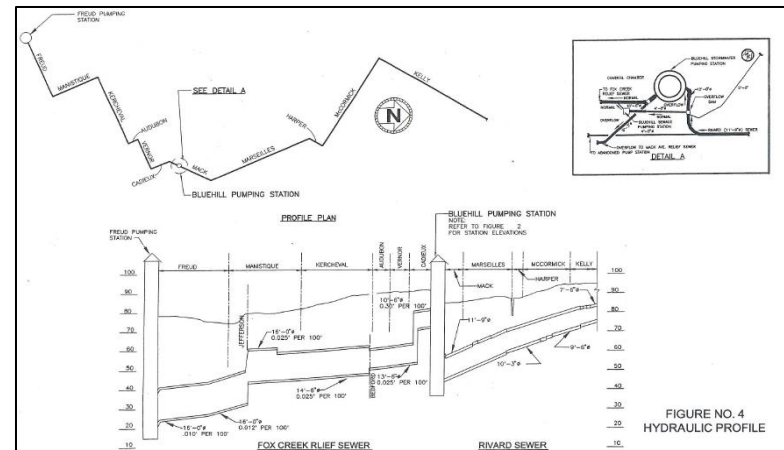


Figure VI-54. Hydraulic Profile at Bluehill Station

## Conner Creek Pump Station



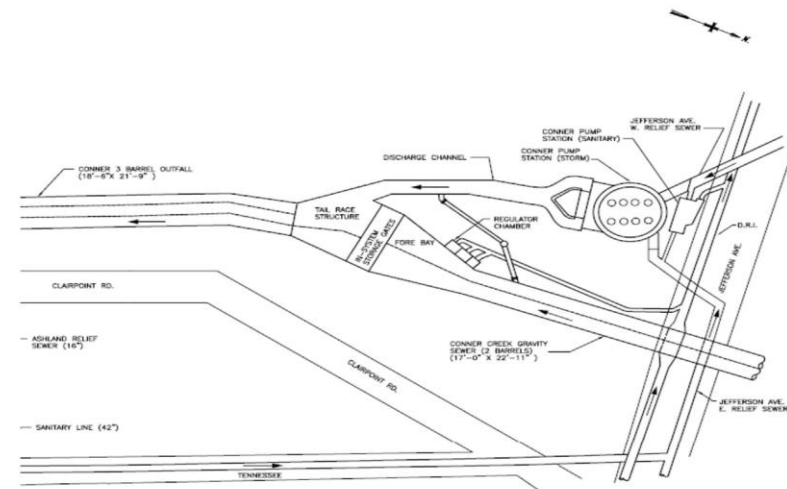
**Figure VI-55. Conner Creek Pump Station**

<b>Max Wet Well Level</b>	74 ft
<b>Sanitary Pumps</b>	SN9 - 500 Hp, 96 MGD SN10 - 350 Hp, 96 MGD SN11 - 500 Hp, 96 MGD SN12 - 200 Hp, 48 MGD
<b>Storm Pumps</b>	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 through 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-56. Schematic of Conner Creek Pump Station**

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

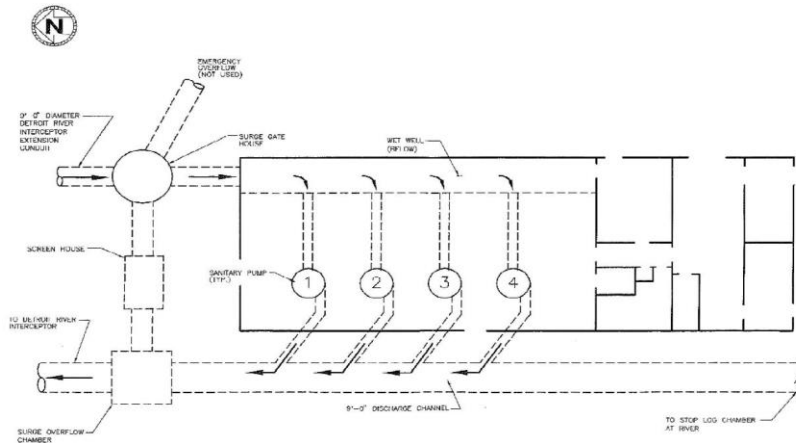
Contract No.	Contract Title	Summary of Work	Year
<b>TW-24-A</b>	Conner Creek	N/A.	
<b>PC-265</b>	Regulator Improvement-Conner Station	N/A.	
<b>PW-212</b>	Conner Creek Pumping Station Motor Driven Pumping Unit Nos. 5 and 6	Installation of Storm Water Pumps 5 and 6.	1947
<b>PW-3042</b>	Conner Creek Sanitary Pumping Station	Construction of the sanitary pump station.	1958
<b>PC-674</b>	Conner Station Rehabilitation	<p>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.</p> <p>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.</p> <p>Rehabilitation of the site shall include replacement of all roadways, curbs, sidewalks, site lighting, and demolition of the oil pump house.</p>	May 2009
<b>PC-713</b>	Authority-Wide Instrumentation, Control and Computer Systems Program	Ovation System.	2007
<b>DWS-828</b>	Emergency Generators	Installed the four (4) Emergency Generators with power of 2MW.	December 1999
<b>Maintenance Contract</b>	Transformer	Replaced the powerhead on Transformer 1 and painted.	2015
<b>PC-773</b>	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-57. Fairview Pump Station**

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



**Figure VI-58. 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

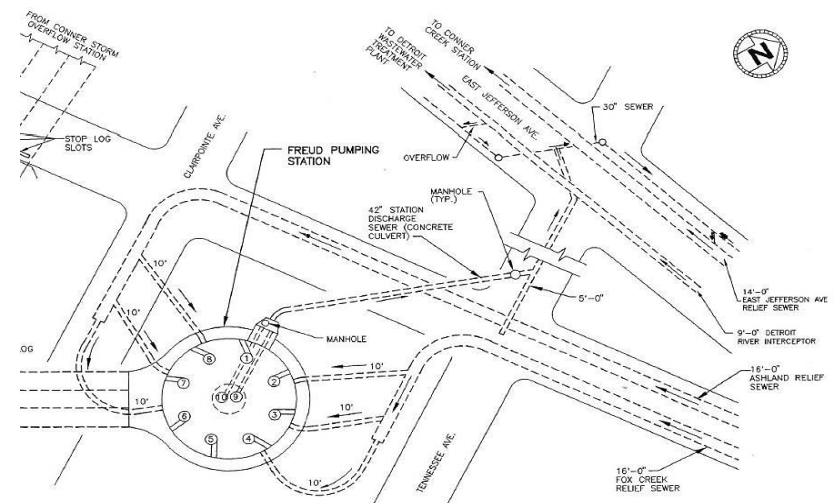


**Figure VI-59. Freud Pump Station**

<b>Max Wet Well Level</b>	71 ft
<b>Sanitary Pumps</b>	SN9 - 200 Hp, 27 MGD SN10 - 200 Hp, 13 MGD
<b>Storm Pumps</b>	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-60. 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-61. Northeast Pump Station**

<b>Max Wet Well Level</b>	26 ft
<b>Sanitary Pumps</b>	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 Conant-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-62. Oakwood Pump Station**

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

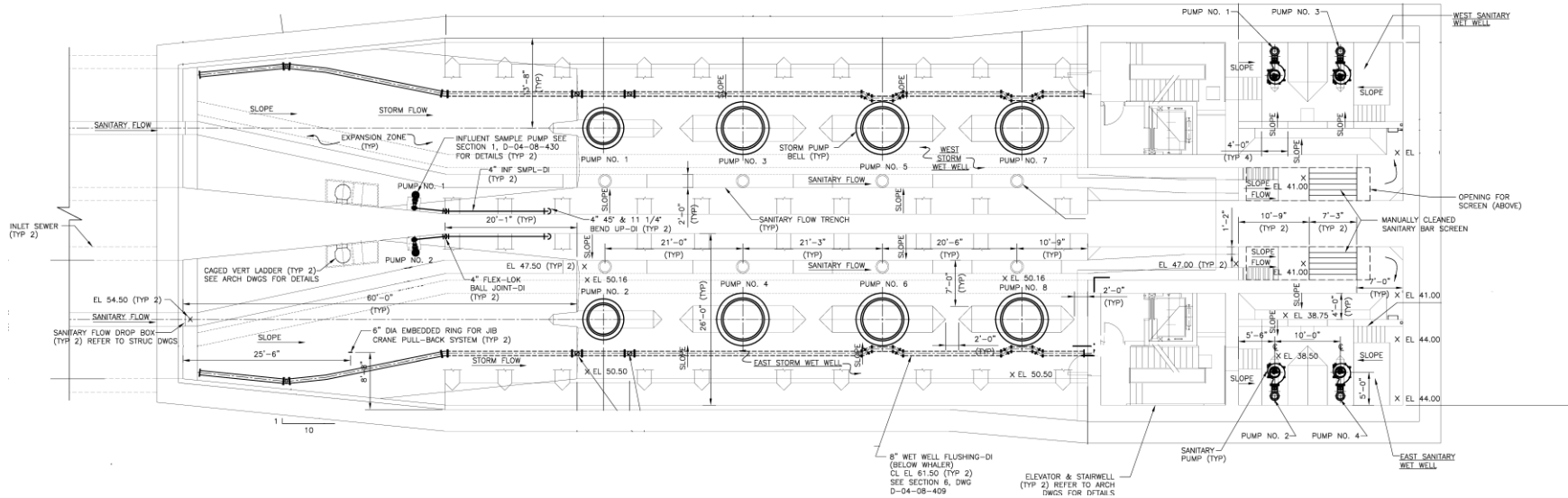


Figure VI-63. Oakwood Pump Station Schematic

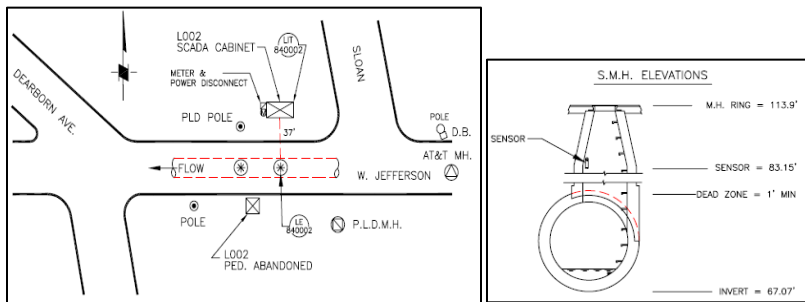
Table VI-13. Wastewater Pumping Stations

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-64.



**Figure VI-64. Example of a level sensor at West Jefferson and Sloan**

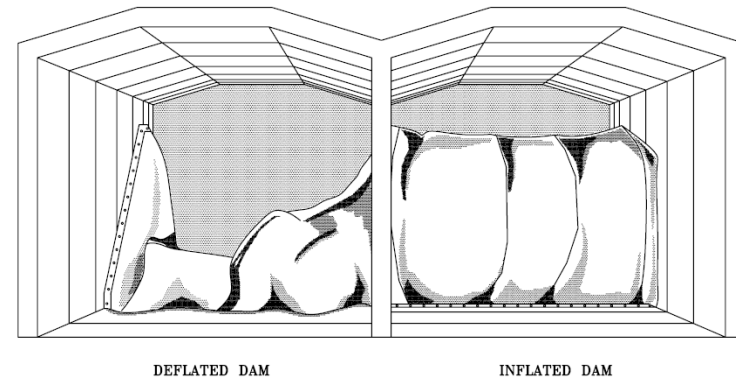
### Inflatable Storage Dam (ISD)

Inflatable Storage Dams, as illustrated in Figure VI-65, are utilized to detain upstream sewage in order to regulate flows to the WRRF. The dams can be remotely deflated and inflated as necessary.

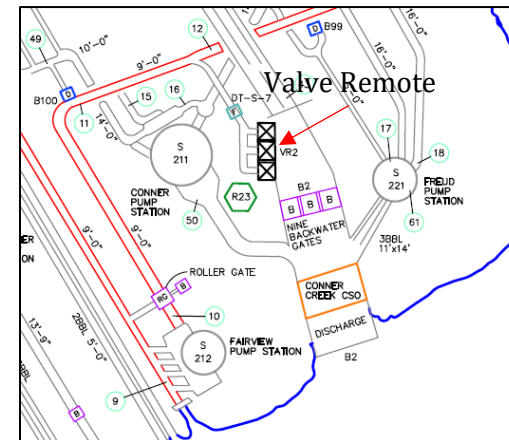
### Valve Remote (VR)

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-66.



**Figure VI-65. Inflatable dam illustration**

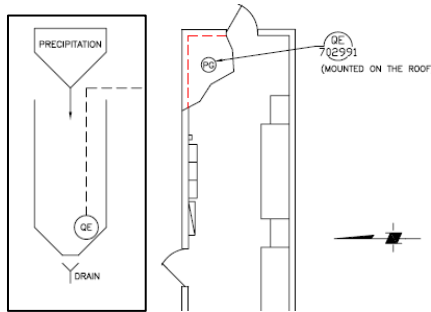


**Figure VI-66. Example of VR located at Conner Pump Station**



## Precipitation Gage

A precipitation gauge (PG, see Figure VI-67) 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-67. 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). The Budget column denotes whether this item is funded by the Water (W) or Wastewater (S) budget. The Project Status column shows which projects are Active (A), New this year (N), Future Planned (FP), Closed or Cancelled (C), Pending Closeout (PC), or have been Reclassified to a different number (R). In the Capital Expense Category (CapEx Category), projects are funded with Construction Bonds (CB), the Improvement & Extension Fund (IE), or Debt Eligible (DE). Cost Allocation has been listed as common to All (CTA), as explained in Chapter III.

**Table VI-14. Centralized Services Projects**

CIP #	Title	Budget	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (Unaudited)	Projected Expenditures								Project Total	Percent of W/S CIP
									FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total		
331001	Roofing Systems Replacement at Water Plants and Booster Pump Stations	W	FP	2014	DE	CTA		0	0	0	128	169	809	1,243	4,844	2,349	7,193	0.33%
331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment Basins (RTB) and Screening Disinfection Facilities (SDF)	S	FP	2017	DE	CTA		0	0	286	709	5,575	5,114	0	0	11,684	11,684	1.85%
351001	Water Facility Lighting Renovations	W	A	2017	IE	CTA		0	2	1,172	1,600	0	0	0	0	2,772	2,774	0.39%
361001	Consolidated Process Control System Upgrades	S	PC	2006	DE	CTA	PC-773C, PC-773D	174	0	0	0	0	0	0	0	0	174	0.00%
361001	Consolidated Process Control System Upgrades	W	PC	2006	DE	CTA	PC-773C, PC-773D	147	0	0	0	0	0	0	0	0	147	0.00%
361002	Data Center Reliability/Availability Improvements	S	PC	2009	DE	CTA	DWS-881	17	0	0	0	0	0	0	0	0	17	0.00%
361002	Data Center Reliability/Availability Improvements	W	PC	2009	DE	CTA	DWS-881	16	0	0	0	0	0	0	0	0	16	0.00%
361003	SCADA Radio Network Upgrade	W	PC	2009	DE	CTA	DWS-882	467	60	0	0	0	0	0	0	0	527	0.00%
361003	SCADA Radio Network Upgrade	S	PC	2009	DE	CTA	DWS-882	852	0	0	0	0	0	0	0	0	852	0.00%
380400	As-needed CIP Implementation Assistance and Related Services	S	A	2002	IE	CTA	CS-166, CS-1433	105	250	803	803	803	0	0	0	2,409	2,764	0.38%
380400	As-needed CIP Implementation Assistance and Related Services	W	A	2002	IE	CTA	CS-166, CS-1433	105	250	803	803	803	0	0	0	2,409	2,764	0.34%
380500	Wastewater General Engineering Services on an As-needed Basis	S	A	2004	IE	CTA	CS-1499	149	114	114	91	0	0	0	0	205	468	0.03%
380500	Wastewater General Engineering Services on an As-needed Basis	W	A	2004	IE	CTA	CS-1499	133	0	0	0	0	0	0	0	0	133	0.00%
380600	As-Needed General Engineering Services	S	A	2004	IE	CTA	CS-1432A	158	170	51	50	0	0	0	0	101	429	0.02%
380600	As-Needed General Engineering Services	W	A	2004	IE	CTA	CS-1432A	158	236	276	0	0	0	0	0	276	670	0.04%
380700	As-Needed Geotechnical and Related Engineering Services	W	A	2006	IE	CTA	CS-1488	115	238	477	477	477	238	0	0	1,669	2,022	0.23%
380700	As-Needed Geotechnical and Related Engineering Services	S	A	2006	IE	CTA	CS-1488	115	0	0	0	0	0	0	0	0	115	0.00%

CIP #	Title	Budget	Project Status	Year Added	CapEx Category	Cost Allocation	Contract Numbers	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	Projected Expenditures							Project Total	Percent of W/S CIP
										FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total		
380800	Geotechnical and Related Services on an As-Needed Basis	W	PC	2007	IE	CTA	CS-1490	82	0	0	0	0	0	0	0	0	82	0.00%
380800	Geotechnical and Related Services on an As-Needed Basis	S	PC	2007	IE	CTA	CS-1490	82	0	0	0	0	0	0	0	0	82	0.00%
380900	General Engineering Services	W	A	2006	IE	CTA	CS-1481	75	0	0	0	0	0	0	0	0	75	0.00%
380900	General Engineering Services	S	A	2007	IE	CTA	CS-1481	63	572	916	425	0	0	0	0	1,341	1,976	0.21%
381000	Energy Management: Electric Metering Improvement Program	S	A	2016	DE	CTA		0	0	0	60	60	255	439	2,186	814	3,000	0.13%
381000	Energy Management: Electric Metering Improvement Program	W	A	2016	DE	CTA		0	0	0	60	60	255	439	2,186	814	3,000	0.11%
Water Centralized Services								1,298	786	2,728	3,068	1,509	1,302	1,682	7,030	10,289	19,403	1.4%
Wastewater Centralized Services								1,715	1,106	2,170	2,138	6,438	5,369	439	2,186	16,554	21,561	2.6%
Total Centralized Services								3,013	1,892	4,898	5,206	7,947	6,671	2,121	9,216	26,843	40,964	4.1%

### 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 addition 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 and High 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

**Project Location:** Saint Clair County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 71.6



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.

**Phase Expenses**

PHASE	Design & Construction Assistance				Contract No	NA	Phase Status	Future Planned Start
Phase Title	LH WTP Low and High Lift Pumping Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	401	1,611	3,169	413	1,943	

**CIP Number: 111001**

PHASE	<b>Construction</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	LH WTP Low and High Lift Pumping Improvements							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
					0	4,037	40,814	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	401	1,611	3,169	4,450	42,757

**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	1/25/2022	90	4/25/2022
Procurement	4/26/2022	188	10/31/2022
Project Execution	11/1/2022	1455	10/26/2026
Project Closeout	10/27/2026	90	1/25/2027

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	12/30/2018	90	3/30/2019
Procurement	3/31/2019	365	3/30/2020
Project Execution	3/31/2020	2400	10/26/2026
Project Closeout	10/27/2026	90	1/25/2027

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		200	2,500	3,000						5,700
2019			0	0	401	1,611	3,169	4,450	42,757	52,388

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 HVAC Improvements

Project Status: Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Project Location: Saint Clair County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	CON-182	Phase Status	Future Planned Start	
Phase Title	CON-182, Miscellaneous Mechanical Improvements at Lake Huron WTP, C1								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	165	0	0	0	0	0	0		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	233	131	131	13	0	0	0		
PHASE	Construction				Contract No	CON-212	Phase Status	New	
Phase Title	CON-212, LH WTP Electrical & Mechanical Process Improvements, C2								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	383	3,535	3,742	0	0		0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	781	3,666	3,873	13	0	0	0		

**CIP Number: 111002**

**Phase Tasks and Dates**

Phase Category	C
Budget	Water
Phase Status	New
Contract No	CON-212
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development	11/15/2016	90	2/13/2017
Procurement	2/14/2017	365	2/14/2018
Project Execution	2/15/2018	798	4/23/2020
Project Closeout	4/24/2020	90	7/23/2020

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	CON-182
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development	8/27/2016	90	11/25/2016
Procurement	11/26/2016	365	11/26/2017
Project Execution	11/27/2017	179	5/25/2018
Project Closeout	5/26/2018	90	8/24/2018

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	2/21/2015	90	5/22/2015
Procurement	5/23/2015	365	5/22/2016
Project Execution	5/23/2016	1431	4/23/2020
Project Closeout	4/24/2020	90	7/23/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		270	1,030	3,130	3,050	422				7,902
2019	18	291	781	3,666	3,873	13	0	0	0	8,642

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

**Budget:** Water

**Classification Lvl 1:** Water

**Classification Lvl 2:** Treatment Plants & Facilities

**Classification Lvl 3:** Lake Huron

**Project Location:** Saint Clair County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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.

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			125							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  
**Project Location:** Saint Clair County

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 38.6



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 & Construction Assistance				Contract No	CS-245	Phase Status	Future Planned Start
Phase Title	CS-245 LH WTP Electrical Tunnel Rehabilitation							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	116	46	64	6	0	0	0	
PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	LH WTP Electrical Tunnel Rehabilitation							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		368	4,232				0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	116	414	4,296	6	0	0	0	

Phase Tasks and Dates				
Phase Category	C			
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
Cost Est Class				
	<b>Construction</b>			
	Task Name	Start Date	Duration	End Date
	Scope Development	5/2/2018	90	7/31/2018
	Procurement	8/1/2018	188	2/5/2019
	Project Execution	2/6/2019	420	4/1/2020

**CIP Number: 111004**

		Task Name	Start Date	Duration	End Date
		Project Closeout	4/2/2020	90	7/1/2020

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Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No	CS-245				
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development	10/31/2016	90	1/29/2017
Procurement	1/30/2017	365	1/30/2018
Project Execution	1/31/2018	791	4/1/2020
Project Closeout	4/2/2020	90	7/1/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,000	3,000	1,600					5,600
2019			116	414	4,296	6	0	0	0	4,832

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

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Project Location: Saint Clair County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>
Budget	Water	
Phase Status	Closed Out	
Contract No	LH-397	
Cost Est Class		

CIP Number: 111005

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		600	323							923
2019	307	448							0	755

Description of CIP Changes



**CIP Number:** 111006  
**Old CIP No.:** 1300  
**Project Title:** LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements



Raw Water Flow Meter

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Lake Huron  
**Project Location:** Saint Clair County

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 62.2**

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	8,508	9,677	6,815	0	0	
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	643	43	139	139	94	4	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	643	43	8,647	9,816	6,909	4	0	

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No	NA				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	3/5/2018	90	6/3/2018

**CIP Number: 111006**

		Task Name	Start Date	Duration	End Date
		Procurement	6/4/2018	363	6/2/2019
		Project Execution	6/3/2019	907	11/26/2021
		Project Closeout	11/27/2021	90	2/25/2022

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Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Water				
Phase Status	Active				
Contract No	CS-1771				
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development	7/26/2016	90	10/24/2016
Procurement	10/25/2016	365	10/25/2017
Project Execution	10/26/2017	1492	11/26/2021
Project Closeout	11/27/2021	90	2/25/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		100	600	12,150	11,780					24,630
2019	1	252	643	43	8,647	9,816	6,909	4	0	26,315

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% 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



Raw sludge clarifier at Lake Huron WTP

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Lake Huron  
**Project Location:** Saint Clair County  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 53.2

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	1,453	3,411	1,137	0	0		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	422	212	159	197	84		0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	422	212	1,612	3,608	1,221	0	0		

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 111007**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	12/3/2018	273	9/2/2019
		Project Execution	9/3/2019	727	8/30/2021
		Project Closeout	8/31/2021	90	11/29/2021

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>
Budget	Water	
Phase Status	Under Procurement	
Contract No	CS-171	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development	8/1/2016	90	10/30/2016
Procurement	10/31/2016	365	10/31/2017
Project Execution	11/1/2017	1398	8/30/2021
Project Closeout	8/31/2021	90	11/29/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			50	920	6,163					7,133
2019		9	422	212	1,612	3,608	1,221	0	0	7,084

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

CIP Number: 111008

Old CIP No.:

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



Lake Huron Water Treatment Plant

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Project Location: Saint Clair County

Project Score 40.6

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

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



**CIP Number: 111008**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total	
2019									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  Water MP Right Sizing  
**Classification Lvl 1:** Water  Reliability/Redundancy  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Northeast  
**Project Location:** City of Detroit **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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
			0	700	1,988	112	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
		0	700	1,988	112	0	

Phase Tasks and Dates				
Phase Category	DB	<b>Design and Build</b>		
Budget	Water			
Phase Status	Future Planned Start			
Contract No				
Cost Est Class				
Task Name	Start Date	Duration	End Date	
Scope Development	4/1/2019	90	6/30/2019	
Procurement	7/1/2019	365	6/30/2020	
Project Execution	7/1/2020	727	6/28/2022	
Project Closeout	6/29/2022	90	9/27/2022	

CIP Number: 112001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			800							800
2019					0	700	1,988	112	0	2,800

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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 51.6



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							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	57	103	60	30	4	0	0	
PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	NE WTP Low Lift Pumping Plant Caisson Rehabilitation							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	13	728	559	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	70	831	619	30	4	0	0	

Phase Tasks and Dates				
Phase Category	C			
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
Cost Est Class				
	<b>Construction</b>			
	Task Name	Start Date	Duration	End Date
	Scope Development	8/17/2017	90	11/15/2017
	Procurement	11/16/2017	188	5/23/2018
	Project Execution	5/24/2018	586	12/31/2019

**CIP Number: 112002**

Task Name	Start Date	Duration	End Date
Project Closeout	1/1/2020	90	3/31/2020

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	8/18/2015	90	11/16/2015
Procurement	11/17/2015	365	11/16/2016
Project Execution	11/17/2016	1139	12/31/2019
Project Closeout	1/1/2020	90	3/31/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		150	1,183							1,333
2019	11	152	70	831	619	30	4	0	0	1,717

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	Construction						Contract No		Phase Status	New
Phase Title	NE WTP High-Lift Pumping Station Electrical Improvements									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
			0	0	0	0	56,000			

PHASE	Design & Construction Assistance						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
							6,265			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond				
		0	0	0	0	62,265				

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	8/18/2025	90	11/16/2025
Procurement	11/17/2025	188	5/24/2026
Project Execution	5/25/2026	1453	5/17/2030
Project Closeout	5/18/2030	90	8/16/2030

**CIP Number: 112003**

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	6/24/2023	90	9/22/2023
Procurement	9/23/2023	365	9/22/2024
Project Execution	9/23/2024	2062	5/17/2030
Project Closeout	5/18/2030	90	8/16/2030

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019					0	0	0	0	62,265	62,265

Description of CIP Changes

CIP Number: 112004

Old CIP No.:

Project Title: NE - WTP Relocation of 12" service line at front of plant

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Northeast

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Plant service water is currently fed off of a DWSD owned 12" water main along 8 Mile Road in front of the plant. GLWA is charged by DWSD for use of this water which represents a substantial long term cost. Project involves disconnecting from the DWSD 12" main and connecting to a GLWA main exiting the plant for its service water supply.

**Project Engineer/Manager:** Govind Patel

**Manager:** Grant Gartrell

**Scope of Work:** Disconnect service water feed for plant from the existing 12" water main owned by DWSD and connect it via new service water piping to an existing GLWA transmission main existing the plant grounds. Work involves site civil and buried piping work.

**Challenges:** Coordinating with DWSD on the disconnection from its 12" water main.

Phase Expenses									
PHASE	Design and Build				Contract No		Phase Status	New	
Phase Title									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
			1,023	1,437			0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
		1,023	1,437			0	

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	6/23/2018	90	9/21/2018
	Procurement	9/22/2018	365	9/22/2019
	Project Execution	9/23/2019	547	3/23/2021
	Project Closeout	3/24/2021	90	6/22/2021

**CIP Number: 112004**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019					1,023	1,437			0	2,460

Description of CIP Changes

**CIP Number:** 113001  
**Old CIP No.:** 262  
**Project Title:** SW WTP Sludge Treatment & Waste Wash Water Treatment Facilities



Aerial view of the Southwest Water Treatment Plant

**Project Status:** Closed  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Southwest  
**Project Location:** Wayne County - Outside Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	FY19	FY20	FY21	FY22	FY23	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	Pending Close-out		
Contract No	SW-548		
Cost Est Class			
<b>Construction</b>			
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



**CIP Number: 113001**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	47,587		1,793							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



Oil hydraulic valve actuators leaking oil

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Southwest  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 53.2

**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								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	186	57	76	44	6	0	0		
PHASE	Construction				Contract No		Phase Status	Future Planned Start	
Phase Title	Construction, SW WTP High Lift Pump Discharge Valve Actuators Replacement								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		1,100	2,800	1,100			0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	186	1,157	2,876	1,144	6	0	0		

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 113002**

Contract No		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Cost Est Class		Procurement	3/1/2018	277	12/3/2018
		Project Execution	12/4/2018	727	11/30/2020
		Project Closeout	12/1/2020	90	3/1/2021

Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>
Budget	Water	
Phase Status	Active	
Contract No	CS-034	
Cost Est Class		

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	4/2/2016	90	7/1/2016
Procurement	7/2/2016	365	7/2/2017
Project Execution	7/3/2017	1246	11/30/2020
Project Closeout	12/1/2020	90	3/1/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		160	160	900	900					2,120
2019	3	112	186	1,157	2,876	1,144	6	0	0	5,484

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



Example of a butterfly valve

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Southwest  
**Project Location:** Wayne County - Outside Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 67.6

**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	Future Planned Start	
Phase Title	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements (E1, E2, E3, E									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
			0	0	0	0	21,946			
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 (C, C2)									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
					0	0	126,340			

CIP Number: 113003

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		0	0	0	0	148,286

**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			
Project Closeout			

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			
Project Execution			
Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018								2,940		2,940
2019					0	0	0	0	148,286	148,286

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	968	1,664	168	0	0	0		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	165	86	121	38	0	0	0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	165	1,054	1,785	206	0	0	0		

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date



**CIP Number: 113004**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	4/3/2018	188	10/8/2018
		Project Execution	10/9/2018	713	9/21/2020
		Project Closeout	9/22/2020	90	12/21/2020

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>
Budget	Water	
Phase Status	Active	
Contract No	CS-1730	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development	6/26/2016	90	9/24/2016
Procurement	9/25/2016	365	9/25/2017
Project Execution	9/26/2017	1091	9/21/2020
Project Closeout	9/22/2020	90	12/21/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		100	3,100	2,309						5,509
2019	7	135	165	1,054	1,785	206	0	0	0	3,352

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 58



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							1,145		
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		
							1,145		

Phase Tasks and Dates	
Phase Category	DB
Budget	Water
Phase Status	New
	Design and Build

**CIP Number: 113005**

Phase Status	new
Contract No	NA
Cost Est Class	

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

**Study**

Task Name	Start Date	Duration	End Date
Scope Development	12/4/2017	60	2/2/2018
Procurement	2/2/2018	210	8/31/2018
Project Execution	8/31/2018	300	6/27/2019
Project Closeout	6/27/2019	90	9/25/2019

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019									1,145	1,145

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 46.6



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
							7,032	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
							7,032	

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	5/11/2027	90	8/9/2027
Procurement	8/10/2027	365	8/9/2028
Project Execution	8/10/2028	503	12/26/2029
Project Closeout	12/27/2029	90	3/27/2030

CIP Number: 113006

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019									7,032	7,032

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 36



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
							6,336	
PHASE	Construction				Contract No		Phase Status	New
Phase Title	SW WTP Architectural and Building Mechanical Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
							31,000	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
							37,336	



**CIP Number: 113007**

**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	11/12/2029	90	2/10/2030
Procurement	2/11/2030	188	8/18/2030
Project Execution	8/19/2030	1079	8/2/2033
Project Closeout	8/3/2033	90	11/1/2033

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	5/11/2027	90	8/9/2027
Procurement	8/10/2027	365	8/9/2028
Project Execution	8/10/2028	1818	8/2/2033
Project Closeout	8/3/2033	90	11/1/2033

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019									37,336	37,336

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	6,327	3,028	0	0	0	0	0		
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 (E1 & E2)								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	479	118	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 (E3)								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	445	355							

**CIP Number: 114001**

PHASE	Construction Assistance						Contract No	cs-073	Phase Status	Active
Phase Title	CS-073, Lake Erie Electric Inspection Services (2nd C)									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	30									

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7,281	3,501	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	10/9/2012	90	1/7/2013
Procurement	1/8/2013	180	7/7/2013
Project Execution	7/8/2013	1953	11/12/2018
Project Closeout	11/13/2018	90	2/11/2019

Phase Category	CA
Budget	Water
Phase Status	Active
Contract No	cs-073
Cost Est Class	

**Construction Assistance**

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

**Construction Assistance**

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	10/8/2010	90	1/6/2011
Procurement	1/7/2011	365	1/7/2012
Project Execution	1/8/2012	2500	11/12/2018
Project Closeout	11/13/2018	90	2/11/2019

CIP Number: 114001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	56,759	20,353	310							77,422
2019	71,252	11,430	7,281	3,501	0	0	0	0	0	93,464

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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 69.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	10,375	7,750	56,875	
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	463	1,433	2,481	1,453	853	925	2,873	
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
463	1,433	2,481	1,453	11,228	8,675	59,748		

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No	NA				

**CIP Number: 114002**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	12/29/2020	188	7/5/2021
		Project Execution	7/6/2021	1791	6/1/2026
		Project Closeout	6/2/2026	90	8/31/2026

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>
Budget	Water	
Phase Status	Under Procurement	
Contract No	CS-103	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development	11/2/2016	90	1/31/2017
Procurement	2/1/2017	365	2/1/2018
Project Execution	2/2/2018	3041	6/1/2026
Project Closeout	6/2/2026	90	8/31/2026

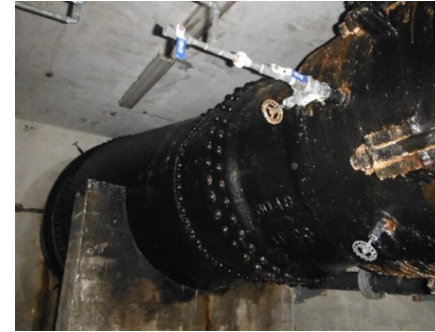
**Total Project Expenses (in \$1,000s) Comparison to Prior Year CIP**

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,500	2,000	12,500	22,000	21,500	26,500		86,000
2019		22	463	1,433	2,481	1,453	11,228	8,675	59,748	85,503

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



Water production flow metering device

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Springwells  
**Project Location:** Multiple Counties  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 50.6

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	704	2,506	2,506	1,257	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	704	2,506	2,506	1,257	0	0	0	

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Active				
Contract No	CON-133				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development			
		Procurement			
		Project Execution	7/31/2017	1096	7/31/2020
		Project Closeout	8/1/2020	90	10/30/2020

CIP Number: 114003

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		1,000	8,800	2,100	1,000					12,900
2019	171	15	704	2,506	2,506	1,257	0	0	0	7,159

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

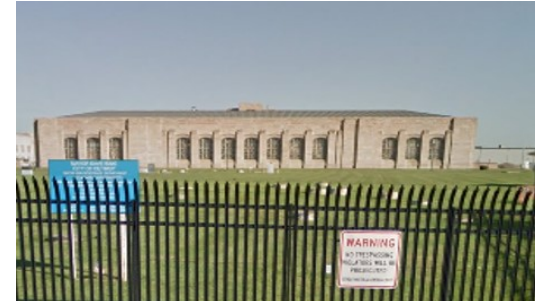
Project Location: Wayne County - Outside Detroit

Innovation

Water MP Right Sizing

Reliability/Redundancy

Project Score



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							0		

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

Phase Tasks and Dates		
Phase Category	C	<b>Construction</b>
Budget	Water	
Phase Status	Closed Out	
Contract No	SP-570	
Cost Est Class		

**CIP Number: 114004**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	398	600								998
2019	404	91							0	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

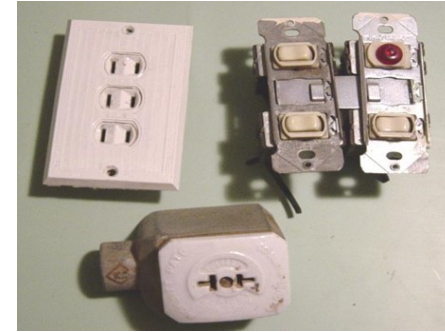
Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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 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 critical to minimizing interruptions/complications during construction. Even then, with all of the underground utilities between the Pump House and Administration Building, and between the Machine Shop/Garage and the 1930 Mixing Chamber, surprises during construction will be difficult to avoid.

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								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	30	413	216	320	146	0		

**CIP Number: 114005**

PHASE	<b>Construction</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	SPW WTP Administration Building Improvements & Underground Fire Protection Loop							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
				2,042	3,500	1,458		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	30	413	2,258	3,820	1,604	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	2/24/2020	90	5/24/2020
Procurement	5/25/2020	188	11/29/2020
Project Execution	11/30/2020	753	12/23/2022
Project Closeout	12/24/2022	90	3/24/2023

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
Scope Development	2/24/2018	90	5/25/2018
Procurement	5/26/2018	365	5/26/2019
Project Execution	5/27/2019	1306	12/23/2022
Project Closeout	12/24/2022	90	3/24/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018				300	1,700					2,000
2019			0	30	413	2,258	3,820	1,604	0	8,125

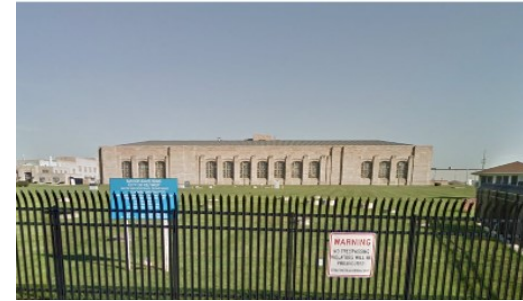
**Description of CIP Changes**

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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 69.4



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	1,136	201	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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	123	148	10						
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	123	1,284	211	0	0	0	0		

Phase Tasks and Dates				
Phase Category	C			
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
Cost Est Class				
	<b>Construction</b>			
	Task Name	Start Date	Duration	End Date
	Scope Development	9/21/2017	90	12/20/2017
	Procurement	12/21/2017	188	6/27/2018
	Project Execution	6/28/2018	363	6/26/2019

**CIP Number: 114006**

Task Name	Start Date	Duration	End Date
Project Closeout	6/27/2019	90	9/25/2019

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	5/3/2016	90	8/1/2016
Procurement	8/2/2016	365	8/2/2017
Project Execution	8/3/2017	692	6/26/2019
Project Closeout	6/27/2019	90	9/25/2019

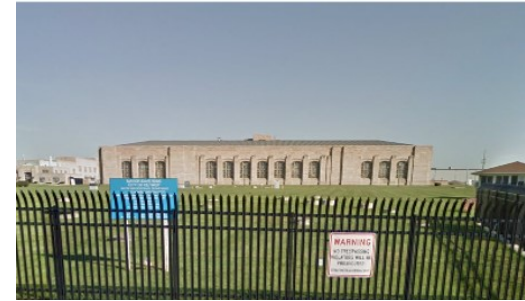
**Total Project Expenses (in \$1,000s) Comparison to Prior Year CIP**

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		100	875	275						1,250
2019		104	123	1,284	211	0	0	0	0	1,722

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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 63.8



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. The plant is able to feed powdered activated carbon (PAC) when needed but only through extraordinary measures because the existing PAC feed systems does not operate as intended. The extraordinary measures cause additional operation and maintenance expense and inefficiencies that should be corrected in the long term. Due to the infrequent need to feed PAC, there is not an immediate need to replace the entire existing PAC system at Springwells. If raw water quality deteriorates unexpectedly and taste and odor causing compound concentrations steadily increase, then replacement of the PAC system at an earlier date would be warranted.  
**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0		0	0	0	0	939		
PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	SPW WTP Powdered Activated Carbon System Improvements								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							3,000		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	0		0	0	0	0	3,939		

Phase Tasks and Dates	
Phase Category	C
Budget	Water
	Construction

**CIP Number: 114007**

Budget	water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Task Name	Start Date	Duration	End Date
Scope Development	7/15/2024	90	10/13/2024
Procurement	10/14/2024	188	4/20/2025
Project Execution	4/21/2025	361	4/17/2026
Project Closeout	4/18/2026	90	7/17/2026

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
Scope Development	10/8/2022	90	1/6/2023
Procurement	1/7/2023	365	1/7/2024
Project Execution	1/8/2024	830	4/17/2026
Project Closeout	4/18/2026	90	7/17/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018					900	2,000				2,900
2019			0		0	0	0	0	3,939	3,939

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  Innovation  
**Budget:** Water  Water MP Right Sizing  
**Classification Lvl 1:** Water  Reliability/Redundancy  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Springwells  
**Project Location:** Wayne County - Outside Detroit **Project Score** 52.8

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	0	424	4,153	6,830	5,697	3	0			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
0	424	4,153	6,830	5,697	3	0	

Phase Tasks and Dates					
Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No	NA				
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	1/24/2018	90	4/24/2018
		Procurement	4/25/2018	365	4/25/2019

**CIP Number: 114008**

Task Name	Start Date	Duration	End Date
Project Execution	4/26/2019	1091	4/21/2022
Project Closeout	4/22/2022	90	7/21/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,200	2,000	4,000	300				7,500
2019			0	424	4,153	6,830	5,697	3	0	17,107

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: Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 78



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	CS-1772 Springwells Water Treatment Plant Service Area Redundancy Study							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	145	0	0	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	145	0	0	0	0	0	0	

**Phase Tasks and Dates**

Phase Category	S	<b>Study</b>			
Budget	Water				
Phase Status	Active				
Contract No	CS-1772				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	10/24/2017	125	2/26/2018
		Procurement	2/27/2018	295	12/19/2018

CIP Number: 114009

Task Name	Start Date	Duration	End Date
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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		450								450
2019		193	145	0	0	0	0	0	0	338

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  
**Project Location:** Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	0	0	0	0	0	0	110,129			

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	110,129	

**CIP Number: 114010**

**Phase Tasks and Dates**

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

**Design**

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	3/9/2024	90	6/7/2024
Procurement	6/8/2024	365	6/8/2025
Project Execution	6/9/2025	2552	6/4/2032
Project Closeout	6/5/2032	90	9/3/2032

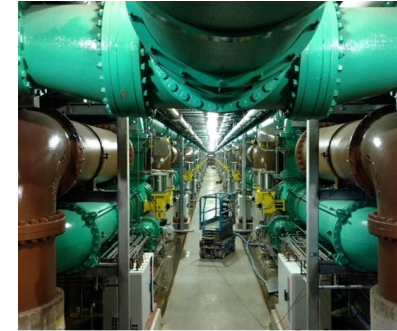
**Total Project Expenses (in \$1,000s) Comparison to Prior Year CIP**

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018				2,000	7,000	8,000	8,000			25,000
2019			0	0	0	0	0	0	110,129	110,129

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 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  
**Project Location:** Wayne County - Outside Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 62.4

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								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	1,278	4,578	4,444	0	0	0		
PHASE	Study and Design and Construction Assistance				Contract No	CS-1671	Phase Status	Active	
Phase Title	CS-1671 Steam, Condensate Return, and Compressed Air Piping Improvements at Springwells WTP								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	450	128	246	210	7	0	0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		

**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	11/30/2017	90	2/28/2018
Procurement	3/1/2018	307	1/2/2019
Project Execution	1/3/2019	839	4/21/2021
Project Closeout	4/22/2021	90	7/21/2021

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	10/1/2016	90	12/30/2016
Procurement	12/31/2016	365	12/31/2017
Project Execution	1/1/2018	1206	4/21/2021
Project Closeout	4/22/2021	90	7/21/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		300	3,450	2,500						6,250
2019	19	261	450	1,406	4,824	4,654	7	0	0	11,621

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



Filter Building roof

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Springwells  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 61

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	486	2,420	0	0	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
486	2,420	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	10/1/2017	91	12/31/2017
	Procurement	12/31/2017	272	9/29/2018
	Project Execution	9/29/2018	456	12/29/2019

CIP Number: 114012

Task Name	Start Date	Duration	End Date
Project Closeout	12/29/2019	90	3/28/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		3,000								3,000
2019			486	2,420	0	0	0	0	0	2,906

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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 77.2



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	SCP-CS-038 Springwells Reservoir Fill Line Improvements								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	181	113	122	61	21	0	0		
PHASE	Construction				Contract No		Phase Status	Future Planned Start	
Phase Title	SPW WTP Reservoir Fill Line Improvements								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		2,356	3,534						

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
181	2,469	3,656	61	21	0	0

Phase Tasks and Dates					
Phase Category	C				
Budget	Water				
Phase Status	Future Planned Start				
Contract No					
	<b>Construction</b>				
	Task Name	Start Date	Duration	End Date	
	Scope Development	10/23/2017	90	1/21/2018	

**CIP Number: 114013**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	1/22/2018	280	10/29/2018
		Project Execution	10/30/2018	547	4/29/2020
		Project Execution	4/30/2020	90	7/29/2020

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-038
Cost Est Class	

**Design & Construction Assistance**

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	8/9/2015	90	11/7/2015
Procurement	11/8/2015	365	11/7/2016
Project Execution	11/8/2016	1268	4/29/2020
Project Closeout	4/30/2020	90	7/29/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		200	3,300	4,000						7,500
2019		120	181	2,469	3,656	61	21	0	0	6,508

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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 critical to minimizing interruptions/complications during construction. Even then, with all of the underground utilities between the Pump House and Administration Building, and between the Machine Shop/Garage and the 1930 Mixing Chamber, surprises during construction will be difficult to avoid.

Phase Expenses								
PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Springwells WTP Underground Fire Protection Loop Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	
PHASE	Construction Assistance				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Springwells WTP Underground Fire Protection Loop Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

CIP Number: 114014

PHASE	Design				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Springwells WTP Underground Fire Protection Loop Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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

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	90	4/8/2018
Procurement	4/9/2018	225	11/20/2018
Project Execution	11/21/2018	180	5/20/2019
Project Closeout	5/20/2019	7	5/27/2019



CIP Number: 114014

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			380	2,909						3,289
2019			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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 100



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							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	2,507	11	0	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	2,507	11	0	0	0	0	0	

**Phase Tasks and Dates**

Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Active				
Contract No	NA				
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	1/30/2016	90	4/29/2016
		Procurement	4/30/2016	365	4/30/2017
		Project Execution	5/1/2017	399	6/4/2018

**CIP Number: 114015**

Task Name	Start Date	Duration	End Date
Project Closeout	6/5/2018	90	9/3/2018

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	2,000							2,500
2019		254	2,507	11	0	0	0	0	0	2,772

Description of CIP Changes

**CIP Number:** 115001  
**Old CIP No.:** 1166  
**Project Title:** **WWP WTP Yard Piping, Valves and Venturi Meters Replacement**



Pumps and Piping

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Treatment Plants & Facilities  
**Classification Lvl 3:** Water Works Park  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 65.4**

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		0	19,833	34,000	14,167			
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	412	968	938	466	230	28	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	412	968	20,771	34,466	14,397	28	0	

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 115001**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	4/1/2019	230	11/17/2019
		Project Execution	11/18/2019	725	11/12/2021
		Project Closeout	11/13/2021	90	2/11/2022

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>
Budget	Water	
Phase Status	Active	
Contract No	CS-055	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development	3/26/2016	90	6/24/2016
Procurement	6/25/2016	365	6/25/2017
Project Execution	6/26/2017	1600	11/12/2021
Project Closeout	11/13/2021	90	2/11/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			5,500	27,900	20,500					53,900
2019		9	412	968	20,771	34,466	14,397	28	0	71,051

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	WW-538 WWP WTP Concrete and Road Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	0
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	0

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>
Budget	Water	
Phase Status	Closed Out	
Contract No	WW-538	
Cost Est Class		



CIP Number: 115002

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	761	2,275								3,036
2019	3	1,948							0	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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
		131	262	153	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
131	262	153	0	0	0	0

Phase Tasks and Dates			
Phase Category	S		
Budget	Water		
Phase Status	Active		
Contract No	NA		
Cost Est Class			
<b>Study</b>			
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

CIP Number: 115003

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		200	375							575
2019			131	262	153	0	0	0	0	546

Description of CIP Changes REVISIED 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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	428	2,943	2,739	0	0	0	0				
PHASE	Design & Construction Assistance							Contract No	CS-1721	Phase Status	Active
Phase Title	CS-1721 Water Works Park WTP Chlorine System Upgrade										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	244	181	139	4	0	0	0				
Total											
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond					
672	3,124	2,878	4	0	0	0					

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>				
Budget	Water					
Phase Status	Under Procurement	Task Name	Start Date	Duration	End Date	

**CIP Number: 115004**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	10/17/2017	84	1/9/2018
		Project Execution	1/10/2018	821	4/10/2020
		Project Closeout	4/11/2020	90	7/10/2020

Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	Active	Scope Development	4/6/2015	90	7/5/2015
Contract No	CS-1721	Procurement	7/6/2015	365	7/5/2016
Cost Est Class		Project Execution	7/6/2016	1374	4/10/2020
		Project Closeout	4/11/2020	90	7/10/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		290	700	8,700						9,690
2019		371	672	3,124	2,878	4	0	0	0	7,049

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

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: General Purpose

Project Location: City of Detroit

Project Score

Project Significance: PROJECT RECLASSIFIED 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	DB-150 Miscellaneous Improvements to Raw Water Tunnels, Shafts and Related Structures							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Under Procurement				
Contract No	DB-150				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development			
		Procurement	10/24/2017	97	1/29/2018



**CIP Number: 116001**

Task Name	Start Date	Duration	End Date
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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,000	1,000	500					2,500
2019			0	0	0	0	0	0	0	0

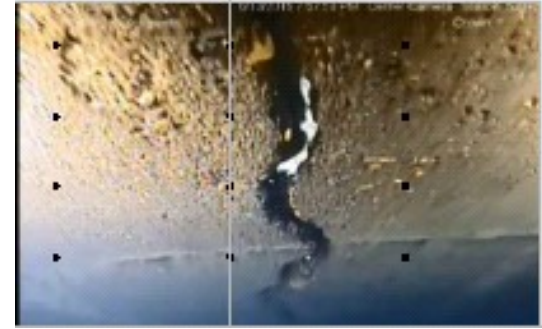
Description of CIP Changes Project has been reclassified into project 116002.

**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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



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 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	Active
Phase Title	DB-150 Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	3,625	9,042	5,468	5,468	5,468	3,998	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,625	9,042	5,468	5,468	5,468	3,998	

Phase Tasks and Dates					
Phase Category	DB	Design and Build			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	Active				
Contract No	DB-150				

**CIP Number: 116002**

Contract NO	DB-150	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	2/14/2017	365	2/14/2018
		Project Execution	2/15/2018	1796	1/16/2023
		Project Closeout	1/17/2023	90	4/17/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	2,000	10,000	15,000	4,900				32,400
2019		10	3,625	9,042	5,468	5,468	5,468	3,998		33,079

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  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 54.6



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	DBW-070 Genesee and Lapeer County Transmission System Improvements								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		
PHASE	Design				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	Genesee and Lapeer County Transmission System Improvements								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	D
Budget	Water
	Design

**CIP Number: 116003**

Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No	NA	Procurement			
Cost Est Class		Project Execution			
		Project Closeout			

Phase Category	DB	<b>Design and Build</b>			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	Active	Scope Development	4/1/2017	90	6/30/2017
Contract No	DBW-070	Procurement	7/1/2017	365	7/1/2018
Cost Est Class		Project Execution	7/2/2018	361	6/28/2019
		Project Closeout	6/29/2019	90	9/27/2019

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			400	3,200	3,200					6,800
2019			0	0	0	0	0	0	0	0

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: Cancelled

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: General Purpose

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 33.4



**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:**

Phase Expenses									
PHASE	Study				Contract No	Phase Status			Cancelled
Phase Title	WTP Right-Sizing Implementation Plan								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		0	0				0		
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			



**CIP Number: 116004**

Phase Tasks and Dates				
Phase Category	S	<b>Study</b>		
Budget	Water			
Phase Status	Cancelled			
Contract No				
Cost Est Class				
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>
		Scope Development	12/30/2017	90
		Procurement	3/31/2018	365
		Project Execution	4/1/2019	
		Project Closeout		

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				0	0				0	0

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



A large water main

**Project Status:** Pending Closeout  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** Macomb County

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	WS-681 Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	2,813	0	0	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
2,813	0	0	0	0	0	0	

**Phase Tasks and Dates**

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	WS-681
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Project Execution	1/1/2017	1	1/2/2017
Project Closeout	1/3/2017	90	4/3/2017

CIP Number: 122001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	26,926	2,367	715							30,008
2019	30,960	1,611	2,813	0	0	0	0	0	0	35,384

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



An example PRV

**Project Status:** Pending Closeout  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	DWS-891 Replacement of Five (5) PRV Pits of Treated Water Transmission System						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	670	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
670	0	0	0	0	0	0

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	DWS-891				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Project Execution	1/31/2018	59	3/31/2018
		Project Closeout	4/1/2018	90	6/30/2018

CIP Number: 122002

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	1,015	1,205								2,220
2019	1,086	611	670	0	0	0	0	0	0	2,367

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 62.4



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	55	122	8,622	17,547	46,022	30,722	25,270		
PHASE	Study				Contract No	CS-152	Phase Status	Active	
Phase Title	CS-152 New Waterworks Park to Northeast Transmission Main								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	1,250	1,250	0	0	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,305	1,372	8,622	17,547	46,022	30,722	25,270

Phase Tasks and Dates				
Phase Category	DB			
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
<b>Design and Build</b>				
	Task Name	Start Date	Duration	End Date
	Scope Development	7/8/2018	90	10/6/2018



**CIP Number: 122003**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	10/7/2018	365	10/7/2019
		Project Execution	10/8/2019	1819	9/30/2024
		Project Closeout	10/1/2024	90	12/30/2024

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			
Procurement			
Project Execution			
Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,500	5,000	10,000	38,000	38,000	37,500		130,000
2019		19	1,305	1,372	8,622	17,547	46,022	30,722	25,270	130,879

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  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 65.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	21,420	44,030	53,550		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	30	1,728	2,644	895	1,667	1,795	3,839		

**CIP Number: 122004**

PHASE	Study						Contract No	CS-165	Phase Status	Active
Phase Title	CS-165 96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	540	69	0	0	0	0	0			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond				
570	1,797	2,644	895	23,087	45,825	57,389				

**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	10/19/2020	90	1/17/2021
Procurement	1/18/2021	188	7/25/2021
Project Execution	7/26/2021	1453	7/18/2025
Project Closeout	7/19/2025	90	10/17/2025

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	4/22/2017	90	7/21/2017
Procurement	7/22/2017	365	7/22/2018
Project Execution	7/23/2018	2552	7/18/2025
Project Closeout	7/19/2025	90	10/17/2025

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			
Project Execution	10/24/2017	248	6/29/2018
Project Closeout			

**CIP Number: 122004**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	1,500	6,000	35,900	31,700	31,700	31,700		139,000
2019		460	570	1,797	2,644	895	23,087	45,825	57,389	132,667

Description of CIP Changes

**CIP Number:** 122005  
**Old CIP No.:** 1323  
**Project Title:** **Transmission System Water Main Work - Replacement of Schoolcraft Water Main**



Water main replacement

**Project Status:** Future Planned  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 42

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	6,146	6,789	566	0	0		

PHASE	Design & Construction Assistance				Contract No		Phase Status	Future Planned Start	
Phase Title									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	16	50	103	110	25				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
16	50	6,249	6,899	591	0	0

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No	NA				
Task Name	Start Date	Duration	End Date		
Scope Development	10/1/2018	90	12/30/2018		

**CIP Number: 122005**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	12/31/2018	188	7/7/2019
		Project Execution	7/8/2019	725	7/2/2021
		Project Closeout	7/3/2021	90	10/1/2021

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

**Design & Construction Assistance**

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	10/1/2016	90	12/30/2016
Procurement	12/31/2016	365	12/31/2017
Project Execution	1/1/2018	1278	7/2/2021
Project Closeout	7/3/2021	90	10/1/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018				7,300	7,250					14,550
2019			16	50	6,249	6,899	591	0	0	13,805

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**



Transmission main

**Project Status:** Future Planned  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 54.2

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	1,680	12,263	10,057	0	0	0		
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	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	16	43	110	97	10				
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		20							
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	16	1,743	12,373	10,154	10	0	0		

**CIP Number: 122006**

**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	7/10/2018	90	10/8/2018
Procurement	10/9/2018	188	4/15/2019
Project Execution	4/16/2019	727	4/12/2021
Project Closeout	4/13/2021	90	7/12/2021

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	7/10/2018	90	10/8/2018
Procurement	10/9/2018	188	4/15/2019
Project Execution	4/16/2019	727	4/12/2021
Project Closeout	4/13/2021	90	7/12/2021

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	10/1/2016	90	12/30/2016
Procurement	12/31/2016	365	12/31/2017
Project Execution	1/1/2018	1197	4/12/2021
Project Closeout	4/13/2021	90	7/12/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		10,000	9,350							19,350
2019		23	16	1,743	12,373	10,154	10	0	0	24,319

Description of CIP Changes: Added prioritization information and project expenses.

CIP Number: 122007

Old CIP No.: 1326

Project Title: Hannan Road Transmission Main

Project Status: Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 57



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 Hannan Road.

**Challenges:**

Phase Expenses								
PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Hannan Road Transmission Main							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		0	1,400	1,800	800	0	0	
PHASE	Design & Construction Assistance				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Hannan Road Transmission Main							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	6	653	211	276	101	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
6	653	1,611	2,076	901	0	0

Phase Tasks and Dates				
Phase Category	C	<b>Construction</b>		
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
Task Name	Start Date	Duration	End Date	
Scope Development	1/1/2019	90	4/1/2019	

**CIP Number: 122007**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	4/2/2019	188	10/7/2019
		Project Execution	10/8/2019	727	10/4/2021
		Project Closeout	10/5/2021	90	1/3/2022

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	4/1/2017	90	6/30/2017
Procurement	7/1/2017	365	7/1/2018
Project Execution	7/2/2018	1190	10/4/2021
Project Closeout	10/5/2021	90	1/3/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,800	2,200						4,000
2019			6	653	1,611	2,076	901	0	0	5,247

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



Water main being laid

**Project Status:** Pending Closeout  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	WS-693 Water System Improvements in Joy Road from Southfield Road to Trinity								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	<b>Construction</b>		
Budget	Water			
Phase Status	Pending Close-out			
Contract No	WS-693			
Cost Est Class				
Task Name	Start Date	Duration	End Date	
Scope Development				
Procurement				
Project Execution				
Project Closeout				

CIP Number: 122009

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	8,323	100								8,423
2019	101	6	0	0	0	0	0	0	0	107

Description of CIP Changes

**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



Water main being replaced

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	WS-693 Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livern							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	16	0	0	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	16	0	0	0	0	0	0	

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	WS-693				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Project Execution	1/1/2017	1	1/2/2017
		Project Closeout	1/3/2017	90	4/3/2017



CIP Number: 122010

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		1,370	1,106	652						3,128
2019			16	0	0	0	0	0	0	16

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 30.2



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										
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	900	3,600	1,500	0	0	0				

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PHASE	Design & Construction Assistance							Contract No		Phase Status	Future Planned Start
Phase Title											
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	23	55	76	49	6						

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FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
23	955	3,676	1,549	6	0	0

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No	NA				
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	11/30/2017	90	2/28/2018
		Procurement	3/1/2018	259	11/15/2018
		Project Execution	11/16/2018	757	12/12/2020

**CIP Number: 122011**

		Task Name	Start Date	Duration	End Date
		Project Closeout	12/13/2020	90	3/13/2021

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Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No					
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development	7/24/2016	90	10/22/2016
Procurement	10/23/2016	365	10/23/2017
Project Execution	10/24/2017	1145	12/12/2020
Project Closeout	12/13/2020	90	3/13/2021

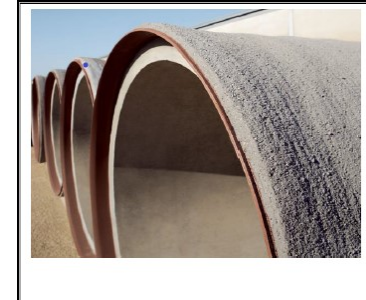
**Total Project Expenses (in \$1,000s) Comparison to Prior Year CIP**

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,800	2,200						4,000
2019			23	955	3,676	1,549	6	0	0	6,209

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  
**Project Location:** Wayne County - Outside Detroit  
 Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy  
**Project Score** 45.6



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	<b>Construction</b>				Contract No	WS-684A	Phase Status	Pending Close-out	
Phase Title	WS-684A 36-inch Water Main in Telegraph Road								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	1,973	0	0	0	0	0	0		
PHASE	<b>Design &amp; Construction Assistance</b>				Contract No		Phase Status	Pending Close-out	
Phase Title	36-inch Water Main in Telegraph Road								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	284	3							
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	2,257	3	0	0	0	0	0		

Phase Tasks and Dates				
Phase Category	C			
Budget	Water			
Phase Status	Pending Close-out			
Contract No	WS-684A			
Cost Est Class				
	<b>Construction</b>			
	Task Name	Start Date	Duration	End Date
	Scope Development			
	Scope Development	7/20/2015	90	10/18/2015
	Procurement	10/19/2015	188	4/24/2016

**CIP Number: 122012**

Task Name	Start Date	Duration	End Date
Project Execution	4/25/2016	646	1/31/2018
Project Closeout	2/1/2018	90	5/2/2018

Phase Category	D/CA
Budget	Water
Phase Status	Pending Close-out
Contract No	
Cost Est Class	

**Design & Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development	7/21/2013	90	10/19/2013
Procurement	10/20/2013	365	10/20/2014
Project Execution	10/21/2014	1198	1/31/2018
Project Closeout	2/1/2018	90	5/2/2018

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		2,000	5,061							7,061
2019	580	7,545	2,257	3	0	0	0	0	0	10,385

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

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Facilities

Classification Lvl 3: Transmission System

Project Location: Oakland County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		0	751	1,315	772	680	1,908	
PHASE	Construction				Contract No	Phase Status		Future Planned Start
Phase Title	14 Mile Transmission Main Loop							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
			0	0	735	12,740	35,525	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	0	751	1,315	1,507	13,420	37,433	

Phase Tasks and Dates	
Phase Category	C
Budget	Water
	Construction

**CIP Number: 122013**

Budget	water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Task Name	Start Date	Duration	End Date
Scope Development	5/31/2021	90	8/29/2021
Procurement	8/30/2021	188	3/6/2022
Project Execution	3/7/2022	1453	2/27/2026
Project Closeout	2/28/2026	90	5/29/2026

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	6/2/2018	90	8/31/2018
Procurement	9/1/2018	365	9/1/2019
Project Execution	9/2/2019	2370	2/27/2026
Project Closeout	2/28/2026	90	5/29/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		1,300	10,500	12,000	6,000					29,800
2019				0	751	1,315	1,507	13,420	37,433	54,426

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  
**Project Location:** Wayne County - Outside Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



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	MOU-4848 Romulus 48-inch Water Main Installation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	403								

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
403						

Phase Tasks and Dates				
Phase Category	C			
Budget	Water			
Phase Status	Pending Close-out			
Contract No	MOU-4848			
Cost Est Class				
	<b>Construction</b>			
	Task Name	Start Date	Duration	End Date
	Project Execution	1/1/2017	545	6/30/2018
	Project Closeout	7/1/2018	90	9/29/2018

CIP Number: 122014

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	1,021	3,514								4,535
2019	436	3,404	403							4,243

Description of CIP Changes

**CIP Number:** 122015  
**Old CIP No.:** 1230c  
**Project Title:** 30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River



Water main

**Project Status:** Pending Closeout  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Transmission System  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**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	CON-105 30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	398							
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
398								

Phase Tasks and Dates				
Phase Category	C	<b>Construction</b>		
Budget	Water			
Phase Status	Closed Out			
Contract No	CON-105			
Cost Est Class				
Task Name	Start Date	Duration	End Date	
Project Execution	1/1/2017	180	6/30/2017	
Project Closeout	7/1/2017	90	9/29/2017	

**CIP Number: 122015**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		2,327								2,327
2019		2,345	398							2,743

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	297	964	331	461	1,144	
PHASE	Construction				Contract No		Phase Status	New
Phase Title	Downriver Transmission Main Loop							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
				0	2,720	10,302	20,978	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	0	0	297	964	3,051	10,763	22,122	

Phase Tasks and Dates				
Phase Category	C	Construction		
Budget	Water			
Task Name	Start Date	Duration	End Date	

**CIP Number: 122016**

Phase Status	New	Task Name	Start Date	Duration	End Date
Contract No		Procurement	5/19/2021	188	11/23/2021
Cost Est Class		Project Execution	11/24/2021	1455	11/18/2025
		Project Closeout	11/19/2025	90	2/17/2026

Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	New	Scope Development	10/1/2018	90	12/30/2018
Contract No		Procurement	12/31/2018	365	12/31/2019
Cost Est Class		Project Execution	1/1/2020	2148	11/18/2025
		Project Closeout	11/19/2025	90	2/17/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019			0	0	297	964	3,051	10,763	22,122	37,197

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Wick Road Station

Project Score

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	DWS-858 Wick Road Station Rehabilitation							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	147	0	0	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
147	0	0	0	0	0	0	

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	1/1/2017	1	1/2/2017
Project Closeout	1/2/2017	90	4/2/2017



CIP Number: 132001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	13,452	250								13,702
2019			147	0	0	0	0	0	0	147

Description of CIP Changes

**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  
**Project Location:** Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							0		

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

Phase Tasks and Dates		
Phase Category	C	<b>Construction</b>
Budget	Water	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	611	1								612
2019	641	28							0	669

**CIP Number: 132002**

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

Project Location: Oakland County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 70.8



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							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		1,056	44					
PHASE	Design & Construction Assistance				Contract No	Phase Status		Active
Phase Title	Isolation Gate Valves for Line Pumps for West Service Center Pumping Station							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	147	173	52	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
147	1,229	96	0	0	0	0

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start				
Contract No					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	11/28/2017	90	2/26/2018

**CIP Number: 132003**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	2/27/2018	222	10/7/2018
		Project Execution	10/7/2018	279	7/13/2019
		Project Closeout	7/13/2019	90	10/11/2019

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

**Design & Construction Assistance**

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	7/24/2016	90	10/22/2016
Procurement	10/23/2016	365	10/23/2017
Project Execution	10/24/2017	626	7/12/2019
Project Closeout	7/12/2019	90	10/10/2019

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			521	1,000						1,521
2019		66	147	1,229	96	0	0	0	0	1,538

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

Project Location: Oakland County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 28.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

PHASE	Study				Contract No	SCP-CS-054	Phase Status	Active
Phase Title	SCP-CS-054 Hydraulic Surge Control for North Service Center Pumping Station							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	157	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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
				0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
157	0	0	0	0	0	0	

CIP Number: 132004

**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			
Procurement			
Project Execution			
Project Closeout			

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			
Project Execution			
Project Closeout			

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	SCP-CS-054
Cost Est Class	

**Study**

Task Name	Start Date	Duration	End Date
Project Execution	12/19/2016	482	4/15/2018
Project Closeout	4/16/2018	90	7/15/2018

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		200	500	2,000	100					2,800
2019		75	157	0	0	0	0	0	0	232

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

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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.

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			125	125						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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 43.4



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	Design & Construction Assistance				Contract No	CS-1749	Phase Status	Active
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Phase Title	CS-1749 Pressure and Control Improvements at the Electric, Ford Road, Michigan, and West Chicago Water Booster Pumping Stations							
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Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	106	185	225	85	0	0	0	

PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
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Phase Title	Pressure and Control Improvements at the Electric, Ford Road, Michigan, and West Chicago Water Booster Pumping Stations							
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Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	60	1,580	360	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
106	245	1,805	445	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	6/6/2018	90	9/4/2018
Procurement	9/5/2018	260	5/23/2019

**CIP Number: 132006**

Task Name	Start Date	Duration	End Date
Project Execution	5/24/2019	503	10/8/2020
Project Closeout	10/9/2020	90	1/7/2021

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1749
Cost Est Class	

**Design & Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development	6/6/2016	90	9/4/2016
Procurement	9/5/2018	365	9/5/2019
Project Execution	9/6/2017	1056	7/28/2020
Project Closeout	7/29/2020	90	10/27/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			200	2,800						3,000
2019		8	106	245	1,805	445	0	0	0	2,609

Description of CIP Changes

**CIP Number:** 132007  
**Old CIP No.:** 1294  
**Project Title:** Imlay PS - Energy Management: Freeze Protection Pump Installation

**Project Status:** Future Planned  Innovation  
**Budget:** Water  Water MP Right Sizing  
**Classification Lvl 1:** Water  Reliability/Redundancy  
**Classification Lvl 2:** SCC  
**Classification Lvl 3:** Pump Station/Reservoir  
**Project Location:** Lapeer County **Project Score** 37.6



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	38	385	134	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	38	385	134	0	0	0

Phase Tasks and Dates					
Phase Category	DB	Design and Build			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	Future Planned Start	Scope Development	1/27/2018	90	4/27/2018
Contract No	NA	Procurement	4/28/2018	365	4/28/2019
Cost Est Class		Project Execution	4/29/2019	501	9/11/2020

CIP Number: 132007

Task Name	Start Date	Duration	End Date
Project Closeout	9/12/2020	90	12/11/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			200	500	300					1,000
2019			0	38	385	134	0	0	0	557

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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 51.2



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	SCP-CS-052 Needs Assessment Study for all Water Booster Pumping Stations								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	722	1,178	0	0	0	0	0		
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
722	1,178	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				
	<b>Study</b>			
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	8/3/2017	454	10/31/2018	

CIP Number: 132008

Task Name	Start Date	Duration	End Date
Project Closeout	11/1/2018	0	11/1/2018

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	1,200							1,700
2019		33	722	1,178	0	0	0	0	0	1,933

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

Budget: Water

Classification Lvl 1: Water

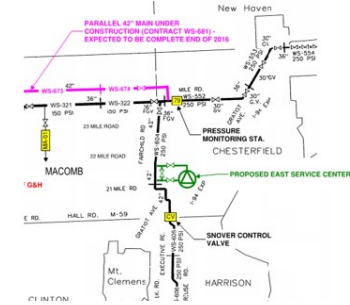
Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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

Phase Tasks and Dates

Phase Category	S	<b>Study</b>
Budget	Water	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

CIP Number: 132009

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		400	100							500
2019		10							0	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  Innovation  
**Budget:** Water  Water MP Right Sizing  
**Classification Lvl 1:** Water  Reliability/Redundancy  
**Classification Lvl 2:** SCC  
**Classification Lvl 3:** Pump Station/Reservoir  
**Project Location:** Oakland County **Project Score** 54

**Project Significance:** 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 Build				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	West Service Center/Duval Rd Division Valve Upgrades								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	2,620	7,430	15,570	8,910	2,606		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	2,620	7,430	15,570	8,910	2,606

Phase Tasks and Dates				
Phase Category	DB			
Budget	Water			
Phase Status	Future Planned Start			
Contract No	NA			
Cost Est Class				
	<b>Design and Build</b>			
	<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
	Scope Development	6/9/2018	90	9/7/2018
	Procurement	9/8/2018	365	9/8/2019
	Project Execution	9/9/2019	1453	9/1/2023
	Project Closeout	9/2/2023	90	12/1/2023

CIP Number: 132010

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			4,200	7,600						11,800
2019			0	0	2,620	7,430	15,570	8,910	2,606	37,136

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: Cancelled

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		
PHASE	Design	Contract No		NA		Phase Status		Cancelled	
Phase Title	Energy Management: West Service Center (WSC) VFD Installation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		
PHASE	Construction	Contract No		NA		Phase Status		Pending Close-out	
Phase Title	Energy Management: West Service Center (WSC) VFD Installation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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: 132011**

**Phase Tasks and Dates**

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

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	D
Budget	Water
Phase Status	Cancelled
Contract No	NA
Cost Est Class	

**Design**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

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			
Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,667	1,667						3,334
2019			0	0	0	0	0	0	0	0

Description of CIP Changes

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

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 61.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
			0	490	2,100	3,640	770	
PHASE	Study and Design and Construction Assistance				Contract No		Phase Status	New
Phase Title	Ypsilanti PS Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		93	606	330	494	494	130	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
		93	606	820	2,594	4,134	900	

Phase Tasks and Dates				
Phase Category	C	Construction		
Budget	Water			
Task Name	Start Date	Duration	End Date	



**CIP Number: 132012**

Phase Status	New	Task Name	Start Date	Duration	End Date
Contract No		Procurement	9/14/2020	186	3/19/2021
Cost Est Class		Project Execution	3/22/2021	893	9/1/2023
		Project Closeout	9/2/2023	90	12/1/2023

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	New	Scope Development	1/27/2018	90	4/27/2018
Contract No		Procurement	4/28/2018	365	4/28/2019
Cost Est Class		Project Execution	4/29/2019	1586	9/1/2023
		Project Closeout	9/2/2023	90	12/1/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				93	606	820	2,594	4,134	900	9,147

Description of CIP Changes

CIP Number: 132013

Old CIP No.:

Project Title: Adams Road Pumping Booster VFD & Gate Valves to Optimize Service Delivery

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

Project Score

Project Significance: Provide new VFDs to meet variable system demands with respect to pressure (improve customer service) and replace gate valves with new more reliable valves.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Install new VFDs and replace existing gate valves.

Challenges:

Phase Expenses

PHASE	Design and Build	Contract No		Phase Status		New	
Phase Title	Adams Road Pumping Booster Electrical VFD Design/Construction Replace VFD (LP #1) & add one VFD Optimize Service Delivery						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
		0	89	296	296	201	
PHASE	Design and Build	Contract No		Phase Status		New	
Phase Title	Adams Road Pumping Booster Pumping System Isolation Valves Design/Construction Replace isolation valves on 4 line pumps Transmission						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
		0	59	235	235	147	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		0	148	531	531	348	

Phase Tasks and Dates

Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	New				
Contract No					
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	12/23/2018	90	3/23/2019
		Procurement	3/24/2019	365	3/23/2020

**CIP Number: 132013**

Task Name	Start Date	Duration	End Date
Project Execution	3/24/2020	1035	1/23/2023
Project Closeout	1/24/2023	90	4/24/2023

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	12/23/2018	90	3/23/2019
Procurement	3/24/2019	365	3/23/2020
Project Execution	3/24/2020	1035	1/23/2023
Project Closeout	1/24/2023	90	4/24/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				0	148	531	531	348		1,558

Description of CIP Changes

CIP Number: 132014

Old CIP No.:

Project Title: Adams Road Pumping Booster Pumping & Switch Gear Improvements

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

Project Score

Project Significance: Existing pumps, motors and electrical gear for station power are beyond useful service life and requires replacement to keep station reliable.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Provide new pumps, high-efficiency motors and electrical gear for entire station.

Challenges:

Phase Expenses

PHASE	Design and Build	Contract No		Phase Status		New	
Phase Title	Adams Road Pumping Booster Pumping System Pump Study/Design/ Construction Analyze the need for a 5th line pump since all 4 existing						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
					21	576	2,579
PHASE	Design and Build	Contract No		Phase Status		New	
Phase Title	Adams Road Pumping Booster Electrical Switchgear Design/ConstructionUpdate Switchgear for potential 5th Pump Transmission and Rese						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
						454	2,046
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
					21	1,030	4,625

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022

**CIP Number: 132014**

Task Name	Start Date	Duration	End Date
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							21	1,030	4,625	5,676

Description of CIP Changes

CIP Number: 132015

Old CIP No.:

Project Title: Newburgh BPS - Pumping System & Building Upgrades

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Wayne County - Outside Detroit

Project Score

Project Significance: Existing pumps, motors and electrical gear are beyond useful service life. Replacement will provide new equipment that is more reliable, energy efficient and optimally sized for system demands. Other improvements involve building mechanical equipment replacement again because of surpassing useful life.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace all existing pumps, motors, VFDs, electrical gear and building mechanical equipment with new.

Challenges:

Phase Expenses

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title	NewburghPumpingBoosterPumpsVariousDesign/Construction							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		0	607	2,396	2,396	2,396	4,375	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	0	607	2,396	2,396	2,396	4,375	

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	12/23/2018	90	3/23/2019
Procurement	3/24/2019	365	3/23/2020
Project Execution	3/24/2020	1826	3/24/2025
Project Closeout	3/25/2025	90	6/23/2025

**CIP Number: 132015**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				0	607	2,396	2,396	2,396	4,375	12,170

Description of CIP Changes



CIP Number: 132016

Old CIP No.:

Project Title: North Service Center BPS Improvements

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Recondition line pumps L-2 through L-6, add VFD, replace existing valves and electrical gear with new due to equipment being past useful service life in order to provide more reliable equipment.

**Project Engineer/Manager:** TBD

**Manager:** Grant Gartrell

**Scope of Work:** Rehabilitate line pumps L-2 through L-6, replace motors and electrical gear with new. Work involves process mechanical and electrical upgrades.

**Challenges:**

Phase Expenses									
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	VFDDesign/ConstructionReplace or recondition line pumps L2 - L6;; add VFDsTransmission and Reservoir Renewal and Reliability								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
						1,225	5,525		
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	PumpControl ValvesDesign/ConstructionUpgrade reservoir pump houses, pumps, valves, motors, gearsTransmission and Reservoir Renewa								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
						1,814	8,186		
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	Program ManagementProvide needed reservoir rehab per recent inspectionTransmission and Reservoir Renewal and Reliability								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
					6	1,481	6,683		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
					6	4,520	20,394		

**CIP Number: 132016**

**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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							6	4,520	20,394	24,920

Description of CIP Changes

CIP Number: 132017

Old CIP No.:

Project Title: North Service Center BPS - On-Site & Off-Site Yard Piping & Valve Replacement

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

Project Score

Project Significance: Yard piping and valves are original to the facility and are beyond useful service life. New valves and yard piping are needed to improve reliable operation; and in order to provide reliable shutoff and water tightness during the subsequent station upgrades to the pumping equipment.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace existing yard valves and yard piping with new.

Challenges: Maintenance of facility operations during construction.

Phase Expenses

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title	North Service Center Site Yard Piping Valves Piping Design/Construction Replace yard valves (BFVs) including those outside fence. Repurpose N							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
			6	2,300	2,506	264		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
		6	2,300	2,506	264		

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
Procurement	7/1/2019	365	6/30/2020
Procurement	4/1/2019	90	6/30/2019
Project Execution	7/1/2020	727	6/28/2022
Project Closeout	6/29/2022	90	9/27/2022

CIP Number: 132017

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019					6	2,300	2,506	264		5,076

Description of CIP Changes

CIP Number: 132018

Old CIP No.:

Project Title: Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps & Underdrain System

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Wayne County - Outside Detroit

Project Score

Project Significance: Existing pumps, yard piping and station valves are past their useful service life and require replacement to maintain reliable operation. Existing belt drain underdrain system protects reservoir from floating when empty so underdrain system must perform to prevent catastrophic damage to reservoirs.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace existing station pumps, yard valves, select yard piping, and rehabilitate reservoir underdrain system.

Challenges: Maintenance of facility operations during construction.

Phase Expenses

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title	Pump MotorDesign/ConstructionReplace LP #3, RP#2 and RP #1Transmission and Reservoir Renewal and Reliability							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
					1,225	1,336	4,190	

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title	ReservoirControl ValvesYard PipingSump PumpsDesign/ConstructionReplace Reservoir Fill valves and vaults, replace cone valves, and contr							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
					612	668	2,095	

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title	ReservoirTankUnderdrainsSump PumpsStudyInspect submersible pumps and underdrains. Transmission and Reservoir Renewal and Reliabil							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
				10	79	81	268	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
			10	1,916	2,085	6,553	

**CIP Number: 132018**

**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	3/31/2020	90	6/29/2020
Procurement	7/1/2021	1819	6/24/2026
Procurement	6/30/2020	365	6/30/2021
Project Execution	6/25/2026	90	9/23/2026
Project Closeout			

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	3/31/2020	90	6/29/2020
Procurement	6/30/2020	365	6/30/2021
Project Execution	7/1/2021	1819	6/24/2026
Project Closeout	6/25/2026	90	9/23/2026

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	3/31/2020	90	6/29/2020
Procurement	6/30/2020	365	6/30/2021
Project Execution	7/1/2021	1819	6/24/2026
Project Closeout	6/25/2026	90	9/23/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019						10	1,916	2,085	6,553	10,564

Description of CIP Changes

CIP Number: 132019

Old CIP No.:

Project Title: Wick Road BPS - Switchgear, Control Valves & Hydropneumatic Tank Replacement

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Wayne County - Outside Detroit

Project Score

Project Significance: Existing switchgear, control valves and hydropneumatic tank at station is beyond useful service life and requires replacement to maintain station reliability

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace station electrical switchgear, L-1 control valve and related controls, hydropneumatic tank and related controls for operation of all station control valves

Challenges: Maintenance of station operations during construction.

Phase Expenses									
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	PowerUtility SupplySwitchgearStudy/Design/ ConstructionReplace switchgearTransmission and Reservoir Renewal and Reliability								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
						490	2,210		
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	Control ValvesDesign/ConstructionProvide new 18" cone valve for L1 with controls. Transmission and Reservoir Renewal and Reliability								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
						122	553		
PHASE	Design and Build				Contract No			Phase Status	New
Phase Title	Hydropneumatic Design/ConstructionReplace hydropneumatic control system for valvesTransmission and Reservoir Renewal and Reliability								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
					6	397	1,792		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				6	1,009	4,555



**CIP Number: 132019**

**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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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	3/31/2021	90	6/29/2021
Procurement	6/30/2021	365	6/30/2022
Project Execution	7/1/2022	1819	6/24/2027
Project Closeout	6/25/2027	90	9/23/2027

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							6	1,009	4,555	5,570

Description of CIP Changes

CIP Number: 132020

Old CIP No.:

Project Title: Franklin BPS - Isolation Gate Valves & Electrical Actuator Improvements

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Oakland County

Project Score

Project Significance: Existing gate valves, pumps, motors, and valve operators are beyond useful service life and require replacement to maintain reliable station.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace existing station pumps, motors, valves, valve operators, and electrical

Challenges: Maintenance of station operation during construction.

Phase Expenses

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
					846	2,009	7,315	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
				846	2,009	7,315	

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	10/4/2020	90	1/2/2021
Procurement	1/3/2021	365	1/3/2022
Project Execution	1/4/2022	1819	12/28/2026
Project Closeout	12/29/2026	90	3/29/2027

CIP Number: 132020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							846	2,009	7,315	10,170

Description of CIP Changes

CIP Number: 132021

Old CIP No.:

Project Title: Imlay BPS - Replace VFDs, Pumps, Motors and HVAC

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Lapeer County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

Project Significance: Existing pumps, motors, VFDs and HVAC system need replacement in order to maintain reliability in the station's operation.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace existing VFDs with new, chiller system VFD cooling, and replace existing station HVAC system.

Challenges: VFD size is unusual in the marketplace and cooling systems are complex for the VFDs.

Phase Expenses							
PHASE	Design and Build				Contract No	Phase Status	
Phase Title							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
						6	12,103

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
					6	12,103

Phase Tasks and Dates					
Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	New				
Contract No					
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	4/2/2022	90	7/1/2022
		Procurement	7/2/2023	365	7/1/2024
		Project Execution	7/2/2024	1089	6/26/2027
		Project Closeout	6/27/2027	90	9/25/2027

CIP Number: 132021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019								6	12,103	12,109

Description of CIP Changes

CIP Number: 132022

Old CIP No.:

Project Title: Joy Road BPS - Replace Reservoir Pumps, Motors and Isolation Valves

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Wayne County - Outside Detroit

Project Score

Project Significance: Existing pumps, motors, and valves are past their useful service life and require replacement to maintain reliable station operation. Existing header has suffered corrosion and needs replacement.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Replace reservoirs pumps, motors, valves, operators, and header with new.

Challenges: Maintenance of station operations during construction.

Phase Expenses

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
						6	6,103	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
					6	6,103	

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	4/2/2022	90	7/1/2022
Procurement	7/2/2022	365	7/2/2023
Project Execution	7/3/2023	1089	6/26/2026
Project Closeout	6/27/2026	90	9/25/2026

CIP Number: 132022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019								6	6,103	6,109

Description of CIP Changes



CIP Number: 132023

Old CIP No.:

Project Title: Reservoir Inspection, Design & Rehabilitation @ Water Works Park and Northeast Water Treatment Plants; and Wick, Schoolcraft, Northwest, North Service Center, and Michigan Avenue Pumping Stations

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Multiple Counties

Innovation

Water MP Right Sizing

Reliability/Redundancy

**Project Score**

Project Significance: Existing reservoirs need to be inspected and any necessary rehabilitation conducted every 5 years according to MDEQ guidelines; and in order to assure that reservoirs are protective of drinking water quality.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Conduct inspections and execute any necessary rehabilitation of the reservoirs that results from the inspection work as directed and approved by GLWA.

**Challenges:**

**Phase Expenses**

PHASE	Construction						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
							17,000			

PHASE	Design & Construction Assistance						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
					449	554	1,106			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond				
				449	554	18,106				

**Phase Tasks and Dates**

Phase Category	C	Construction
Budget	Water	

**CIP Number: 132023**

Phase Status	New	Task Name	Start Date	Duration	End Date
Contract No		Procurement	12/26/2022	188	7/2/2023
Cost Est Class		Project Execution	7/3/2023	1089	6/26/2026
		Project Closeout	6/27/2026	90	9/25/2026

Phase Category	D/CA	<b>Design &amp; Construction Assistance</b>			
Budget	Water	Task Name	Start Date	Duration	End Date
Phase Status	New	Scope Development	9/26/2020	90	12/25/2020
Contract No		Procurement	12/26/2020	365	12/26/2021
Cost Est Class		Project Execution	12/27/2021	1642	6/26/2026
		Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							449	554	18,106	19,109

Description of CIP Changes

CIP Number: 132024

Old CIP No.:

Project Title: Reservoir Inspection, Design and Rehabilitation @ Adams, East-side, Farmington, Ford Road, Franklin, Haggerty and Joy Road

Project Status: New

Innovation

Budget: Water

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Project Location: Multiple Counties

**Project Score**

Project Significance: Existing reservoirs need to be inspected and any necessary rehabilitation conducted every 5 years according to MDEQ guidelines; and in order to assure that reservoirs are protective of drinking water quality.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Conduct inspections and execute any necessary rehabilitation of the reservoirs that results from the inspection work as directed and approved by GLWA.

**Challenges:**

Phase Expenses									
PHASE	Construction				Contract No		Phase Status	New	
Phase Title									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							17,000		
PHASE	Design & Construction Assistance				Contract No		Phase Status	New	
Phase Title									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
					449	554	1,106		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
				449	554	18,106	

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	New	Task Name	Start Date	Duration	End Date
Contract No		Scope Development	9/26/2022	90	12/25/2022

**CIP Number: 132024**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement	12/26/2022	188	7/2/2023
		Project Execution	7/3/2023	1089	6/26/2026
		Project Closeout	6/27/2026	90	9/25/2026

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

**Design & Construction Assistance**

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	9/26/2020	90	12/25/2020
Procurement	12/26/2020	365	12/26/2021
Project Execution	12/27/2020	1642	6/26/2025
Project Closeout	6/27/2025	90	9/25/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019							449	554	18,106	19,109

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

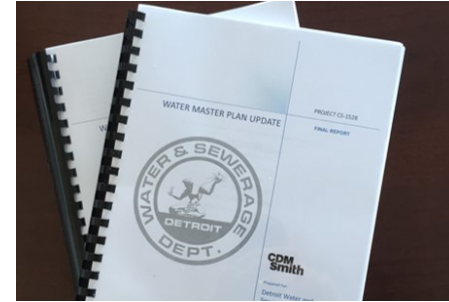
Classification Lvl 2: General Purpose

Classification Lvl 3: General Purpose

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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

Phase Tasks and Dates

Phase Category	S	<b>Study</b>
Budget	Water	
Phase Status	Pending Close-out	
Contract No		
Cost Est Class		

**CIP Number: 161001**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		290								290
2019	222	108							0	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

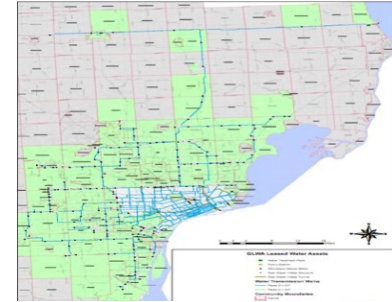
Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	430								
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	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	107								



**CIP Number: 170100**

PHASE	<b>Construction</b>							Contract No	SCP-NE-017	Phase Status	Active
Phase Title	SCP-NE-017: Weiss Construction: Phosphor										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	104										
PHASE	<b>Construction</b>							Contract No	LH-398	Phase Status	Pending Close-out
Phase Title	SCP-LH-398: Phosphoric Acid Tank Fill Lines										
Phase Total											
PHASE	<b>Design &amp; Construction Assistance</b>							Contract No	SCP-CS-1656	Phase Status	Active
Phase Title	CS-1656: Applied Science: Flow Measurement										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	211	307	175								
PHASE	<b>Design and Construction</b>							Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated Water Treatment Plant /Pump Station Allowance										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	1,000	1,000	3,000	3,000	3,000	15,000				
PHASE	<b>Design &amp; Construction Assistance</b>							Contract No	CS-1738	Phase Status	Active
Phase Title	CS-1738: Alfred Benesch: Orion & Newberg										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
		969	1,057	103							
PHASE	<b>Construction</b>							Contract No	SCP-DWS-059	Phase Status	Active
Phase Title	SCP-DWS-059: CA Hull: Intake Lagoon										
Phase Total											
PHASE	<b>Construction</b>							Contract No	SCP-NE-007	Phase Status	Active
Phase Title	SCP-NE-007: DeCal: Instrument Air Compressor										
Phase Total											
PHASE	<b>Construction</b>							Contract No	DWS-063	Phase Status	Active
Phase Title	DWS-063 Adams Road Water Isolation Gate										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	271	822									

**CIP Number: 170100**

PHASE	<b>Design</b>						Contract No	CS-1630	Phase Status	Closed Out																						
Phase Title	CS-1630: Black & Veatch: Master Specs																															
<b>Phase Total</b>																																
PHASE	<b>Study</b>						Contract No	CS-187	Phase Status	Active																						
Phase Title	GLWA-CS-187: FK Eng: Raw Water Intake																															
<b>Phase Total</b>																																
PHASE	<b>Design</b>						Contract No	CS-1674	Phase Status	Closed Out																						
Phase Title	CS-1674: Testing Engineers: Roof Inspect																															
<b>Phase Total</b>																																
PHASE	<b>Construction</b>						Contract No	SCP-CON-094	Phase Status	Active																						
Phase Title	SCP-CON-094: Z Contr: Belle Isle Water Station																															
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond																									
	363																															
PHASE	<b>Design &amp; Construction Assistance</b>						Contract No	CS-1432A	Phase Status	Active																						
Phase Title	CS-1432A Belle Isle Water Station																															
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond																									
	66																															
PHASE	<b>Construction</b>						Contract No	CON-225	Phase Status	Future Planned Start																						
Phase Title	CON-225 Orion Booster Station																															
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond																									
		1,198	826	41																												
PHASE	<b>Construction</b>						Contract No	SW-011	Phase Status	Pending Close-out																						
Phase Title	SW-011, Alfred Benesh: Heating Improvements																															
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond																									
	45																															
<table border="1"> <tr> <td>FY18-Proj</td> <td>FY19-Proj</td> <td>FY20-Proj</td> <td>FY21-Proj</td> <td>FY22-Proj</td> <td>FY23-Proj</td> <td>FY24 and Beyond</td> <td colspan="4"></td> </tr> <tr> <td>1,597</td> <td>4,296</td> <td>3,058</td> <td>3,144</td> <td>3,000</td> <td>3,000</td> <td>15,000</td> <td colspan="4"></td> </tr> </table>											FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond					1,597	4,296	3,058	3,144	3,000	3,000	15,000				
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond																										
1,597	4,296	3,058	3,144	3,000	3,000	15,000																										

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Active				
Contract No	SCP-NE-007				
Cost Est Class					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Closed Out				
Contract No	SCP-SP-009				
Cost Est Class					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Active				
Contract No	SCP-NE-017				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Project Execution	1/1/2017	1	1/2/2017
		Project Closeout	1/3/2017	90	4/3/2017
Phase Category	C	Construction			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	LH-398				
Cost Est Class					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Active				
Contract No	CON-153				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Project Execution	1/1/2017	1	1/2/2017
		Project Closeout	1/2/2017	90	4/2/2017
Phase Category	C	Construction			
Budget	Water				
Phase Status	Active				
Contract No	SCP-DWS-059				
Cost Est Class					

**CIP Number: 170100**

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	SW-011
Cost Est Class	

**Construction**

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	DWS-063
Cost Est Class	

**Construction**

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	7/19/2017	365	7/19/2018
Project Closeout	7/20/2018	83	10/11/2018

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	CON-225
Cost Est Class	1

**Construction**

Task Name	Start Date	Duration	End Date
Project Execution	7/2/2018	725	6/26/2020
Project Closeout	6/27/2020	90	9/25/2020

Phase Category	D
Budget	Water
Phase Status	Closed Out
Contract No	CS-1630
Cost Est Class	

**Design**

Phase Category	D
Budget	Water
Phase Status	Closed Out
Contract No	CS-1674
Cost Est Class	

**Design**

CIP Number: 170100

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

**Design and Construction**

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
Scope Development	7/19/2014	90	10/17/2014
Procurement	10/18/2014	365	10/18/2015
Project Execution	10/19/2015	1381	7/31/2019
Project Closeout	8/1/2019	90	10/30/2019

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1432A
Cost Est Class	

**Design & Construction Assistance**

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	7/2/2018	725	6/26/2020
Project Closeout	6/27/2020	90	9/25/2020

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	CS-187
Cost Est Class	

**Study**

Phase Category	DBA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-1692
Cost Est Class	

**Design Build Assistance**

CIP Number: 170100

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		12,645	19,650	20,000	20,000	10,000	10,000			92,295
2019	3,009	3,768	1,597	4,296	3,058	3,144	3,000	3,000	15,000	39,872

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**



Example of concrete testing

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Programs  
**Classification Lvl 3:** Programs  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score** 20

**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	<b>Study and Design and Construction Assistance</b>				Contract No	CS-1726	Phase Status	Under Procurement
Phase Title	CS-1726 As Needed Construction Materials, Environmental Media and Special Testing Services, Construction Inspection, and Other Technic							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	172	472	572	572	0	0	0	
	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	<b>Study and Design and Construction Assistance</b>			
Budget	Water				
Phase Status	Under Procurement				
Contract No	CS-1726				
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		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



CIP Number: 170200

Task Name	Start Date	Duration	End Date
Project Closeout	1/26/2022	90	4/26/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			500	500	500					1,500
2019			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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	1,425	61	1,561	1,561	1,561	1,514	105		
PHASE	Design				Contract No	CS-108	Phase Status	Pending Close-out	
Phase Title	CS-108, Arcadis, WTP Automation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0								

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
1,425	61	1,561	1,561	1,561	1,514	105	

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 170300**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Project Closeout	5/31/2022	90	8/29/2022

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Phase Category	D	Design
Budget	Water	
Phase Status	Pending Close-out	
Contract No	CS-108	
Cost Est Class		

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,500	1,500	1,500	1,500	1,500			7,500
2019		13	1,425	61	1,561	1,561	1,561	1,514	105	7,801

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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	900	1,350	1,800	1,800	1,800	1,800	

PHASE	Design				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Water Transmission Improvement Program							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	100	150	200	200	200	200	

PHASE	Construction				Contract No	SCP-DWS-018	Phase Status	Pending Close-out
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	40							

**CIP Number: 170400**

PHASE	<b>Construction</b>						Contract No	DBW-070	Phase Status	Pending Close-out
Phase Title	DBW-070 Weiss: Lapper County Chlor Booster									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	189	0								

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
229	1,000	1,500	2,000	2,000	2,000	2,000

**Phase Tasks and Dates**

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	DBW-070
Cost Est Class	

**Construction**

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	Pending Close-out
Contract No	SCP-DWS-018
Cost Est Class	

**Construction**

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			
Project Closeout			

**CIP Number: 170400**

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			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			10,000	10,000	10,000	10,000	10,000			50,000
2019	120	955	229	1,000	1,500	2,000	2,000	2,000	2,000	11,804

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 Rehabilitation and Replacement Program**



A large valve for a transmission pipe

**Project Status:** Active  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Programs  
**Classification Lvl 3:** Programs  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 66.8**

**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**

<b>PHASE</b>	<b>Construction</b>				<b>Contract No</b>	CON-181	<b>Phase Status</b>	Active
<b>Phase Title</b>	CON-181 Transmission System Valve Replacement/Rehabilitation							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	2,000	4,000	4,000	3,274	0	0		
<b>PHASE</b>	<b>Design and Build</b>				<b>Contract No</b>	NA	<b>Phase Status</b>	Active
<b>Phase Title</b>	Unallocated Transmission System Valve Assessment and Rehabilitation/Replacement							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	726	4,000	4,000	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,000	4,000	4,000	3,274	726	4,000	4,000

**Phase Tasks and Dates**

<b>Phase Category</b>	C	<b>Construction</b>			
<b>Budget</b>	Water				
<b>Phase Status</b>	Active				
<b>Contract No</b>	CON-181				
<b>Cost Est Class</b>					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	7/1/2018	91	9/30/2018



**CIP Number: 170500**

		Task Name	Start Date	Duration	End Date
		Procurement	9/30/2018	880	2/26/2021
		Project Execution	2/26/2021	1825	2/25/2026
		Project Closeout	2/25/2026	90	5/26/2026

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Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Active				
Contract No	NA				
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	91	9/30/2018
Procurement	9/30/2018	880	2/26/2021
Project Execution	2/26/2021	1825	2/25/2026
Project Closeout	2/25/2026	90	5/26/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			2,930	3,100	3,100	3,100	3,100			15,330
2019			2,000	4,000	4,000	3,274	726	4,000	4,000	22,000

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

Water MP Right Sizing

Classification Lvl 1: Water

Reliability/Redundancy

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

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. This project will pilot and utilize new technologies to accurately identify the condition of these buried assets by constructing access ways for inspection and the installation of sensors and fiber optic cables for real-time monitoring of condition. 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: Construct access structures and utilize new technology to evaluate the existing conditions of the transmission system. Construction of in place sensors and cables may be necessary to adequately access condition. Provide the necessary recommendation for replacement and 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	Design and Build	Contract No		NA	Phase Status		Future Planned Start
Phase Title	Unallocated Water Transmission Main Asset Assessment Program						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	2,627	2,501	3,001	4,001	4,001	5,001	5,001
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	2,627	2,501	3,001	4,001	4,001	5,001	5,001

Phase Tasks and Dates

Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No	NA	Scope Development	7/1/2018	91	9/30/2018
Cost Est Class		Procurement	9/30/2018	880	2/26/2021

**CIP Number: 170600**

Task Name	Start Date	Duration	End Date
Project Execution	2/26/2021	1825	2/25/2026
Project Closeout	2/25/2026	90	5/26/2026

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			2,626	2,000	2,000	2,000	2,000			10,626
2019			2,627	2,501	3,001	4,001	4,001	5,001	5,001	26,133

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  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



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	DWS-874 Unallocated Booster Stations and Reservoirs Inspection, Rehabilitation and Inspection Repair Program								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		1,417	0	0	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	1,417	0	0	0	0	0	0		

Phase Tasks and Dates					
Phase Category	PM	<b>Project Management</b>			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	DWS-874				
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Project Execution	1/1/2017	1	1/2/2017
		Project Closeout	1/3/2017	90	4/3/2017

CIP Number: 170700

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	9,571	2,316	88							11,975
2019	11,422	1,492	1,417	0	0	0	0	0	0	14,331

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  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

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-								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	170	4,250	4,080	4,080	4,420		
PHASE	Design & Construction Assistance				Contract No	CS-151	Phase Status	Active	
Phase Title	CS-151 Phase - Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SP-WTP and SW-								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	39	472	583	260	260	260	225		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
39	472	753	4,510	4,340	4,340	4,645

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Water				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No	NA	Scope Development	5/30/2019	90	8/28/2019
Cost Est. Class					

**CIP Number: 170800**

Task Name	Start Date	Duration	End Date
Procurement	8/29/2019	188	3/4/2020
Project Execution	3/5/2020	1455	2/28/2024
Project Closeout	2/29/2024	90	5/29/2024

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-151
Cost Est Class	

**Design & Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development	10/2/2017	79	12/20/2017
Procurement	12/21/2017	363	12/19/2018
Project Execution	12/20/2018	1896	2/28/2024
Project Closeout	2/29/2024	90	5/29/2024

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		50	3,300	2,550	2,550	2,550				11,000
2019			39	472	753	4,510	4,340	4,340	4,645	19,099

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



Example of a Water Meter

**Project Status:** Future Planned  
**Budget:** Water  
**Classification Lvl 1:** Water  
**Classification Lvl 2:** Programs  
**Classification Lvl 3:** Programs  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 20**

**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	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated Suburban Water Meter Pit Rehabilitation and Meter Replacement							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	410	4,613	3,690	3,690	3,997	4,100	0	
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
410	4,613	3,690	3,690	3,997	4,100	0		

Phase Tasks and Dates	
Phase Category	C
Budget	Water
	Construction

**CIP Number: 170900**

Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No	NA	Procurement			
Cost Est Class		Project Execution	1/1/2018	1795	12/1/2022
		Project Closeout	12/2/2022	90	3/2/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	4,000	4,000	4,000	4,000	4,000			20,500
2019			410	4,613	3,690	3,690	3,997	4,100	0	20,500

Description of CIP Changes Program was extended into 2023 causing the increase in overall project expense.

CIP Number: 171000

Old CIP No.:

Project Title: LH - WTP Sanitary Survey Improvements

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Saint Clair County

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.

**Project Engineer/Manager:** Grant Gartrell

**Manager:** Grant Gartrell

**Scope of Work:** Design and construct improvements or modifications to plant process facilities that may be identified by the MDEQ during its 3-year cycle of sanitary surveys.

**Challenges:** Possible negotiations with MDEQ on items they identify in sanitary surveys that GLWA may take exception.

**Phase Expenses**

PHASE	Design and Build						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
		45	49	49	49	49	247			
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
		45	49	49	49	49	247			

**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	4/1/2017	90	6/30/2017
Procurement	7/1/2018	365	7/1/2019
Project Execution	7/2/2019	3637	6/16/2029
Project Closeout	6/17/2029	90	9/15/2029

**CIP Number: 171000**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				45	49	49	49	49	247	488

Description of CIP Changes

CIP Number: 171100

Old CIP No.:

Project Title: NE - WTP Sanitary Survey Improvements

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Northeast

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.

**Project Engineer/Manager:** Govind Patel

**Manager:** Grant Gartrell

**Scope of Work:** Design and construct improvements or modifications to plant process facilities that may be identified by the MDEQ during its 3-year cycle of sanitary surveys.

**Challenges:** Possible negotiations with MDEQ on items they identify in sanitary surveys that GLWA may take exception.

**Phase Expenses**

PHASE	Design and Build						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	6	75	79	79	79	79	399			
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
	6	75	79	79	79	79	399			

**Phase Tasks and Dates**

Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	New				
Contract No					
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	4/1/2017	90	6/30/2017
		Procurement	7/1/2017	365	7/1/2018
		Project Execution	7/2/2018	3637	6/16/2028
		Project Closeout	6/17/2028	90	9/15/2028

CIP Number: 171100

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019			6	75	79	79	79	79	399	796

Description of CIP Changes

CIP Number: 171200

Old CIP No.:

Project Title: SW-WTP Sanitary Survey Improvements

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Wayne County - Outside Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score

Project Significance: Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: Design and construct improvements or modifications to plant process facilities that may be identified by the MDEQ during its 3-year cycle of sanitary surveys.

Challenges: Possible negotiations with MDEQ on items they identify in sanitary surveys that GLWA may take exception.

Phase Expenses

PHASE	Design and Build						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
		6	75	79	79	79	399			
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
		6	75	79	79	79	399			

Phase Tasks and Dates

Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	New				
Contract No					
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	4/1/2018	90	6/30/2018
		Procurement	7/1/2018	365	7/1/2019
		Project Execution	7/2/2019	3639	6/18/2029
		Project Closeout	6/19/2029	90	9/17/2029

**CIP Number: 171200**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				6	75	79	79	79	399	717

Description of CIP Changes



CIP Number: 171300

Old CIP No.:

Project Title: WWP - WTP Sanitary Survey Improvements

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.

**Project Engineer/Manager:** TBD

**Manager:** Grant Gartrell

**Scope of Work:** Design and construct improvements or modifications to plant process facilities that may be identified by the MDEQ during its 3-year cycle of sanitary surveys.

**Challenges:** Possible negotiations with MDEQ on items they identify in sanitary surveys that GLWA may take exception.

**Phase Expenses**

PHASE	Design and Build						Contract No		Phase Status	New
Phase Title										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
		45	49	49	49	49	247			
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
		45	49	49	49	49	247			

**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	4/1/2017	90	6/30/2017
Procurement	7/1/2017	365	7/1/2018
Project Execution	7/2/2018	3637	6/16/2028
Project Closeout	6/17/2028	90	9/15/2028

**CIP Number: 171300**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				45	49	49	49	49	247	488

Description of CIP Changes

CIP Number: 171400

Old CIP No.:

Project Title: Energy Management Program @ All Water Facilities

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** Existing lighting systems at most facilities are energy inefficient. Replacement with new, modern LED lighting type systems will reduce electrical usage and costs.

**Project Engineer/Manager:** TBD

**Manager:** Grant Gartrell

**Scope of Work:** Replace existing lighting fixtures with new lighting fixtures at the water plants and water booster pumping stations.

**Challenges:**

**Phase Expenses**

PHASE	Design and Build				Contract No		Phase Status	New
Phase Title								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
				520	693	693	5,094	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
			520	693	693	5,094	

**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	6/22/2019	90	9/20/2019
Procurement	9/21/2019	365	9/20/2020
Project Execution	9/21/2020	3637	9/6/2030
Project Closeout	9/7/2030	90	12/6/2030

**CIP Number: 171400**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019						520	693	693	5,094	7,000

Description of CIP Changes

CIP Number: 171500

Old CIP No.:

Project Title: Roof Replacement - Various Water Facilities

Project Status: New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**Project Significance:** These existing roofs are leaking and are beyond repair. Replacement is needed to protect building interiors and most importantly sensitive electrical equipment.

**Project Engineer/Manager:** TBD

**Manager:** Grant Gartrell

**Scope of Work:** Replace existing roofs with new built-up roofing systems.

**Challenges:**

Phase Expenses									
PHASE	Design and Build				Contract No		Phase Status	New	
Phase Title	Phase 758522114 - Roof replacement at LH-WTP, SW-WTP, WWP-WTP, Imlay and Franklin Booster Stations								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		111	878						
PHASE	Design and Build				Contract No		Phase Status	New	
Phase Title	Phase 1252759899 - Roof replacement at LH-WTP, SW-WTP, Orion & North Service Center Booster Stations								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
			108	210	24	1,159	167		
PHASE	Design and Build				Contract No		Phase Status	New	
Phase Title	Phase 464631552 - Roof replacement at LH-WTP, NE-WTP, WWP-WTP, Ford Road, Northwest, EastSide, Newburgh, Rochester, Schoolcraft								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							8,595		
PHASE	Design and Build				Contract No		Phase Status	New	
Phase Title	Phase 1218915073 - Roof replacement at LH-WTP, SW-WTP, WWP-WTP, Imlay Booster Station and Franklin Booster Station (1)								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
							9,969		

**CIP Number: 171500**

PHASE	<b>Design and Build</b>				Contract No		Phase Status	New
Phase Title	Phase 1900377390 - Roof replacement at LH-WTP, SW-WTP, WWP-WTP, Imlay Booster Station and Franklin Booster Station (2)							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
							6,025	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	111	986	210	24	1,159	24,756	

**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	3/31/2030	90	6/29/2030
Procurement	6/30/2030	365	6/30/2031
Project Execution	7/1/2031	1455	6/25/2035
Project Closeout	6/26/2035	90	9/24/2035

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	3/31/2026	90	6/29/2026
Procurement	6/30/2026	365	6/30/2027
Project Execution	7/1/2027	1455	6/25/2031
Project Closeout	6/26/2030	90	9/24/2030

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	4/2/2022	90	7/1/2022
Procurement	7/2/2022	365	7/2/2023
Project Execution	7/3/2023	1453	6/25/2027
Project Closeout	6/26/2027	90	9/24/2027

**CIP Number: 171500**

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	3/31/2018	90	6/29/2018
Procurement	6/30/2018	365	6/30/2019
Project Execution	7/1/2019	1453	6/23/2023
Project Closeout	6/24/2023	90	9/22/2023

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	1/23/2018	90	4/23/2018
Procurement	4/24/2018	365	4/24/2019
Project Execution	4/25/2019	363	4/22/2020
Project Closeout	4/23/2020	90	7/22/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				111	986	210	24	1,159	24,756	27,246

Description of CIP Changes

## 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



Pipe Gallery

**Project Status:** Active  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** Primary Treatment  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	PC-757 Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	12,983	16,107	8,671	6,033	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	12,983	16,107	8,671	6,033	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

CIP Number: 211001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		10,848	12,097	20,990	7,968					51,903
2019	14	10,229	12,983	16,107	8,671	6,033	0	0	0	54,037

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Pump Station 2

Project Score

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	CS-1444 Pump Station No. 2 Pumping Improvements							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	174	40	18	0	0	0	0	
PHASE	Construction				Contract No	PC-795	Phase Status	Active
Phase Title	PC-795, Pump Station No. 2 Pumping Improvements							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	425	2,414	603	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	599	2,454	621	0	0	0	0	

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Active	Scope Development			
Contract No	PC-795	Procurement			
Cost Est Class		Project Execution	6/9/2016	1482	6/30/2020

**CIP Number: 211002**

		Task Name	Start Date	Duration	End Date
		Project Closeout	7/1/2020	60	8/30/2020

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Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Wastewater				
Phase Status	Active				
Contract No	CS-1444				
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/20/2010	3257	6/20/2019
Project Closeout	6/20/2019	60	8/19/2019

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	456	1,157	1,304	616						3,533
2019	29	80	599	2,454	621	0	0	0	0	3,783

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Primary Clarifiers

Project Score

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	CS-1484 Rehabilitation of Primary Clarifiers							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	272	201	56	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
272	201	56	0	0	0	0	

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	3611	6/30/2020
Project Closeout	7/1/2020	60	8/30/2020

CIP Number: 211003

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	1	220	240	120						581
2019	1,702		272	201	56	0	0	0	0	2,231

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



Rack and Grit

**Project Status:** Active  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** Primary Treatment  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	PC-789 Pump Station 1 Rack & Grit and MPI Sampling Station 1 Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	3,648	2,752	303	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
3,648	2,752	303	0	0	0	0	

**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

CIP Number: 211004

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	13,887	2,303	2,652	2,652						21,494
2019	18,341	2,603	3,648	2,752	303	0	0	0	0	27,647

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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 72.8



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	CS-130 Pump Station No. 2 Improvements Phase II at Wastewater Treatment Plant (WRRF)							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	7	0	515	115	250	57	115	
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	9,044	9,044	2,940	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	7	0	515	115	9,294	9,101	3,055	

**CIP Number: 211005**

**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	6/8/2020	663	4/2/2022
Procurement	4/2/2022	180	9/29/2022
Project Execution	9/30/2022	1080	9/14/2025
Project Closeout	9/15/2025	60	11/14/2025

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			
Procurement	11/1/2019	220	6/8/2020
Project Execution	6/8/2020	1924	9/14/2025
Project Closeout	9/15/2025	60	11/14/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			600	1,700	4,800	3,700				10,800
2019			7	0	515	115	9,294	9,101	3,055	22,087

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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 75



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	500	1,800	201	350	201	40		
PHASE	Construction				Contract No		Phase Status	Future Planned Start	
Phase Title	Rehabilitation of Main Lift Pumps at Pump Station No. 1								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	2,261	9,044	9,044	679		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	0	500	1,800	2,462	9,394	9,245	719		

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Wastewater				
Task Name	Start Date	Duration	End Date		

**CIP Number: 211006**

Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No		Procurement	9/2/2021	180	3/1/2022
Cost Est Class		Project Execution	3/2/2022	1080	2/14/2025
		Project Closeout	2/15/2025	60	4/16/2025

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Future Planned Start	Scope Development			
Contract No	NA	Procurement	4/2/2018	220	11/8/2018
Cost Est Class		Project Execution	11/9/2018	2289	2/14/2025
		Project Closeout	2/15/2025	60	4/16/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			600	5,350	5,125	2,054				13,129
2019			0	500	1,800	2,462	9,394	9,245	719	24,120

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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 65.2



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 the PS-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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	7	402	1,719	402	173	229	

PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Replacement of Bar Racks at Pump Station No.2							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	261	2,002	6,783	8,585	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
0	7	402	1,980	2,404	6,956	8,814	

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 211007**

Contract No		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Cost Est Class		Procurement	8/24/2021	180	2/20/2022
		Project Execution	2/21/2022	1080	2/5/2025
		Project Closeout	2/6/2025	60	4/7/2025

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

**Study and Design and Construction Assistance**

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development			
Procurement	3/25/2019	220	10/31/2019
Project Execution	11/1/2019	1923	2/5/2025
Project Closeout	2/6/2025	60	4/7/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			650	2,900	3,300	2,817				9,667
2019			0	7	402	1,980	2,404	6,956	8,814	20,563

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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 74.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	7	115	1,259	471	298	102	
PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of Ferric Chloride Feed Systems							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	2,261	5,239	2,261	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	0	7	115	1,259	2,732	5,537	2,363	



**CIP Number: 211008**

**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	12/8/2019	450	3/2/2021
Procurement	3/4/2021	180	8/31/2021
Project Execution	9/1/2021	720	8/22/2023
Project Closeout	8/23/2023	60	10/22/2023

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			
Procurement	5/1/2019	220	12/7/2019
Project Execution	12/8/2019	1353	8/22/2023
Project Closeout	8/23/2023	60	10/22/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			400	1,400	5,200	2,000	633			9,633
2019			0	7	115	1,259	2,732	5,537	2,363	12,013

Description of CIP Changes



**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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



**Project Score 70.2**

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							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	7	859	572	144	144	
PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of the Circular Primary Clarifier Scum Removal System							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	5,652	4,861	

CIP Number: 211009

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	7	859	572	5,796	5,005

**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	11/8/2020	450	2/1/2022
Procurement	2/3/2022	180	8/2/2022
Project Execution	8/3/2022	720	7/23/2024
Project Closeout	7/24/2024	60	9/22/2024

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			
Procurement	4/1/2020	220	11/7/2020
Project Execution	11/8/2020	1353	7/23/2024
Project Closeout	7/24/2024	60	9/22/2024

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			266	324	1,870	2,671	2,670	2,679		10,480
2019			0	0	7	859	572	5,796	5,005	12,239

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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

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	PC-776 Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Second								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	<b>Construction</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Pending Close-out	Scope Development			
Contract No	PC-776	Procurement			
Cost Est Class		Project Execution			

CIP Number: 212001

Task Name	Start Date	Duration	End Date
Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	24,060	115								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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



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	CS-1448 Study, Design, & Construction Management Services for Modified Detroit River Outfall No. 2 - WRRF							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	S/D/CA	<b>Study and Design and Construction Assistance</b> <table border="1"> <thead> <tr> <th>Task Name</th> <th>Start Date</th> <th>Duration</th> <th>End Date</th> </tr> </thead> <tbody> <tr> <td>Scope Development</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Procurement</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project Execution</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project Closeout</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Task Name	Start Date	Duration	End Date	Scope Development				Procurement				Project Execution				Project Closeout			
Task Name	Start Date		Duration	End Date																		
Scope Development																						
Procurement																						
Project Execution																						
Project Closeout																						
Budget	Wastewater																					
Phase Status	Pending Close-out																					
Contract No	CS-1448																					
Cost Est Class																						

CIP Number: 212002

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	8,449	33								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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



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	PC-796 Aeration System Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	9,087	2,647	2,502	0	0	0	0	
PHASE	Study and Design and Construction Assistance				Contract No	CS-157	Phase Status	Active
Phase Title	CS-157 Aeration System Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	186	72	21	0	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
9,273	2,719	2,523	0	0	0	0

Phase Tasks and Dates					
Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Active				
Contract No	PC-796				
		Task Name	Start Date	Duration	End Date
		Scope Development			

**CIP Number: 212003**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		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**

	<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
	Scope Development			
	Procurement			
	Project Execution	2/21/2012	2588	3/24/2019
	Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		2,348	11,197	2,658						16,203
2019	1,903	1,902	9,273	2,719	2,523	0	0	0	0	18,320

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



Chlorinator/Sulfonator buildings

**Project Status:** Future Planned  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** Secondary Treatment & Disinfe  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 81.6**

**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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	2,101	2,422	661	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	0	2,101	2,422	661	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	2/20/2018	180	8/19/2018

**CIP Number: 212004**

Task Name	Start Date	Duration	End Date
Project Execution	8/20/2018	600	4/11/2020
Project Closeout	4/12/2020	60	6/11/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			400	2,800	1,800					5,000
2019		86	0	2,101	2,422	661	0	0	0	5,270

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	PC-786 Rouge River Outfall No. 2 (RRO-2) Segment 1 - WRRF Modifications								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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-786
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

CIP Number: 212005

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

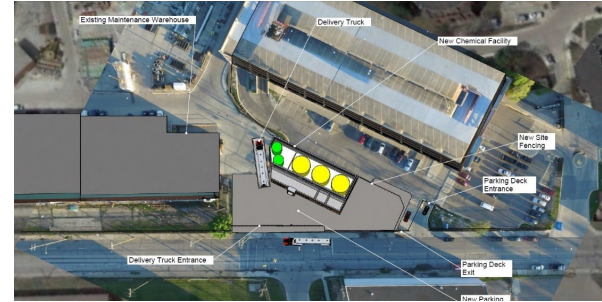
CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	12,125	62								12,187
2019	209	43	0	0	0	0	0	0	0	252

Description of CIP Changes

**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 & Disinfection  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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	CS-1781 Rouge River Outfall (RRO) Disinfection (Alternative)							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	661	597	156	0	0	0	0	
PHASE	Design and Build				Contract No	PC-797	Phase Status	Under Procurement
Phase Title	PC-797 Rouge River Outfall (RRO) Disinfection (Alternative)							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	19,958	15,220	4,001	0	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	20,619	15,817	4,157	0	0	0	0	

Phase Tasks and Dates		
Phase Category	CM	Construction Management
Budget	Wastewater	
Phase Status	Under Procurement	

**CIP Number: 212006**

Contract No CS-1781  
Cost Est Class

Phase Category DB  
Budget Wastewater  
Phase Status Under Procurement  
Contract No PC-797  
Cost Est Class

**Design and Build**

Task Name	Start Date	Duration	End Date
Project Execution	2/19/2016	1137	4/1/2019
Project Closeout	4/2/2019	273	12/31/2019

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	729	6,530	15,800	15,520	9,020					47,599
2019	912	5,961	20,619	15,817	4,157	0	0	0	0	47,466

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 \$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

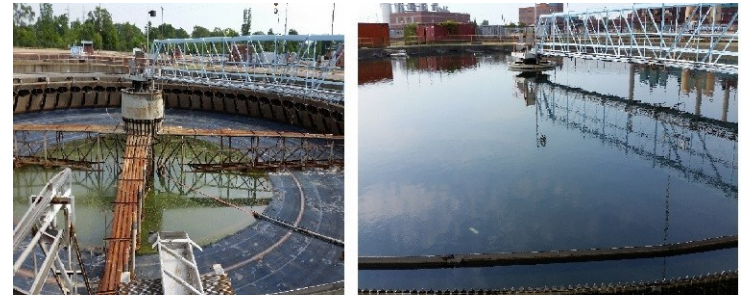
Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 53.2



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							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	859	1,374	859	172	458	

PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of the Secondary Clarifiers							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	859	1,374	3,680	9,216	19,676

**CIP Number: 212007**

**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	1/2/2019	180	7/1/2019
Procurement	7/1/2019	220	2/6/2020
Project Execution	2/7/2020	1860	3/12/2025
Project Closeout	3/15/2025	60	5/14/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			301	3,576	5,543	5,540	5,540	10,499		30,999
2019			0	0	859	1,374	3,680	9,216	19,676	34,805

Description of CIP Changes



CIP Number: 212008

Old CIP No.:

Project Title: WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)

Project Status: New

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

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
Phase Title	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)								New
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
			0	339	5,652	5,652	6,444		
PHASE	Study and Design and Construction Assistance							Contract No	Phase Status
Phase Title	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)								New
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
		0	230	802	917	115	365		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
		0	230	1,141	6,569	5,767	6,809		

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	New				
Contract No					
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	11/8/2019	660	8/29/2021
		Procurement	8/31/2021	180	2/27/2022

**CIP Number: 212008**

Task Name	Start Date	Duration	End Date
Project Execution	2/28/2022	1080	2/12/2025
Project Closeout	2/13/2025	60	4/14/2025

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

**Study and Design and Construction Assistance**

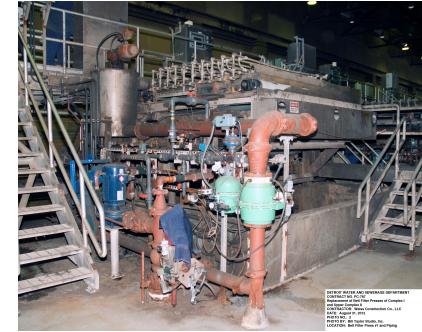
Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	4/1/2019	220	11/7/2019
Project Execution	11/8/2019	1923	2/12/2025
Project Closeout	2/13/2025	60	4/14/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2019				0	230	1,141	6,569	5,767	6,809	20,516

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



PC 787 Belt filter presses replacement

**Project Status:** Pending Closeout  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** Residuals Management  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**

**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	<b>Construction</b>				Contract No	PC-787	Phase Status	Pending Close-out
Phase Title	PC-787 Replacement of Belt Filter Presses for Complex I and Upper Level Complex II							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

PHASE	<b>Study and Design and Construction Assistance</b>				Contract No	CS-1483	Phase Status	Pending Close-out
Phase Title	CS-1483 Replacement of Belt Filter Presses for Complex I and Upper Level Complex II							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Pending Close-out				
Contract No	PC-787				
		Task Name	Start Date	Duration	End Date
		Scope Development			

**CIP Number: 213001**

Cost Est Class		Task Name	Start Date	Duration	End Date
		Procurement			
		Project Execution			
		Project Closeout			

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Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Pending Close-out	Scope Development			
Contract No	CS-1483	Procurement			
Cost Est Class		Project Execution			
		Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	29	1,872								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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 76.2



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	CS-1701 Rehabilitation of Central Offload Facility							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	665	229	172	57	0	0	0	

PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of Central Offload Facility							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	6,218	7,348	4,522	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
665	6,447	7,520	4,579	0	0	0	

**Phase Tasks and Dates**

Phase Category	C	Construction
Budget	Wastewater	

**CIP Number: 213002**

Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No		Procurement	4/20/2018	180	10/17/2018
Cost Est Class		Project Execution	10/18/2018	914	4/19/2021
		Project Closeout	4/20/2021	60	6/19/2021

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Active	Scope Development			
Contract No	CS-1701	Procurement			
Cost Est Class		Project Execution	10/17/2016	1645	4/19/2021
		Project Closeout	1/19/2021	60	3/20/2021

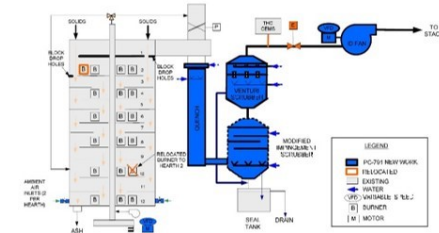
**Total Project Expenses (in \$1,000s) Comparison to Prior Year CIP**

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		800	5,850	6,750	4,350					17,750
2019		202	665	6,447	7,520	4,579	0	0	0	19,413

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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



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 PC-791 Sewage Sludge Incinerator Air Quality Improvements at WRRF									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	459	0	0	0	0	0	0		
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
459	0	0	0	0	0	0			

Phase Tasks and Dates				
Phase Category	DB			
Budget	Wastewater			
Phase Status	Pending Close-out			
Contract No	PC-791			
Cost Est Class				
<b>Design and Build</b>				
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	

**CIP Number: 213003**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	33,043	3,000								36,043
2019	34,544	16,091	459	0	0	0	0	0	0	51,094

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



New GLWA Biosolids Dryer Facility

**Project Score**

**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
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Phase Title: PC-792 Biosolids Dryer Facility at WRRF

Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	193	23	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
193	23	0	0	0	0	0

**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

**CIP Number: 213004**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	134,191	1,691	60	26						135,968
2019	1,439	585	193	23	0	0	0	0	0	2,240

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  
**Project Location:** City of Detroit

- Innovation
  - Water MP Right Sizing
  - Reliability/Redundancy
- Project Score 38.4**



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	161	91	91	57		

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	1,130	2,261	1,114		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	161	1,221	2,352	1,171

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Wastewater	Task Name	Start Date	Duration	End Date

**CIP Number: 213005**

Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date
Contract No		Procurement	11/6/2021	180	5/5/2022
Cost Est Class		Project Execution	5/6/2022	540	10/28/2023
		Project Closeout	8/29/2023	60	10/28/2023

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Future Planned Start	Scope Development	12/4/2019	180	6/1/2020
Contract No		Procurement	6/1/2020	220	1/7/2021
Cost Est Class		Project Execution	1/8/2021	1023	10/28/2023
		Project Closeout	10/29/2023	60	12/28/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			900	200						1,100
2019			0	0	0	161	1,221	2,352	1,171	4,905

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



Sludge Feed Pumps

**Project Status:** Future Planned  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** Residuals Management  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 67.8**

**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						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
			57	275	68		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	57	275	2,391	1,130	0

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Future Planned Start				
Contract No					
Cost Est Class					
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development	4/10/2020	300	2/4/2021

CIP Number: 213006

Task Name	Start Date	Duration	End Date
Procurement	2/6/2021	180	8/5/2021
Project Execution	8/6/2021	540	1/28/2023
Project Closeout	1/29/2023	60	3/30/2023

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	3/6/2019	180	9/2/2019
Procurement	9/2/2019	220	4/9/2020
Project Execution	4/10/2020	1023	1/28/2023
Project Closeout	1/29/2023	60	3/30/2023

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		33	402	750						1,185
2019	1	3	0	0	57	275	2,391	1,130	0	3,857

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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 87.2**

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	CON-197 Modification to Incinerator Sludge Feed Systems at Complex -II								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	100	6,685	11,305	3,477	0	0	0		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	467	102	51	0	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
567	6,787	11,356	3,477	0	0	0

**CIP Number: 213007**

**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	8/22/2016	430	10/26/2017
Procurement	10/30/2017	172	4/20/2018
Project Execution	4/21/2018	1035	2/19/2021
Project Closeout	2/20/2021	60	4/21/2021

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	8/22/2016	1642	2/19/2021
Project Closeout	2/20/2021	60	4/21/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		1,500	9,600	7,822						18,922
2019			567	6,787	11,356	3,477	0	0	0	22,187

Description of CIP Changes

Additional scope to the previous CIP. Construction of two Small Capital Projects, Replacement of 19 MCCs and Replacement of the 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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 57.8



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	0	0	687	916	222	229	286			

PHASE	Construction						Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of the Ash Handling Systems									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	0	0	0	0	3,392	5,840	9,044			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	687	916	3,614	6,069	9,330

Phase Tasks and Dates

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 213008**

Contract No		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Cost Est Class		Procurement	8/31/2021	180	2/27/2022
		Project Execution	2/28/2022	1080	2/12/2025
		Project Closeout	2/13/2025	60	4/14/2025

Phase Category	S/D/CA	<b>Study and Design and Construction Assistance</b>
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No		
Cost Est Class		

<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Scope Development	10/3/2018	180	4/1/2019
Procurement	4/1/2019	220	11/7/2019
Project Execution	11/8/2019	1923	2/12/2025
Project Closeout	2/13/2025	60	4/14/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			530	1,045	6,225	5,725	4,791			18,316
2019			0	0	687	916	3,614	6,069	9,330	20,616

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 39.4



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

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PHASE	Construction				Contract No		Phase Status	Future Planned Start
Phase Title	Phosphorous Recovery at WRRF							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

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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
	Construction

**CIP Number: 213009**

Budget	wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

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	5/6/2020	180	11/2/2020
Procurement	11/2/2020	220	6/10/2021
Project Execution	6/11/2021	1293	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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018				500	2,000	6,250	6,250			15,000
2019			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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 62.2



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	4,001	7,764	1,000	0	0	0	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	4,001	7,764	1,000	0	0	0

Phase Tasks and Dates				
Phase Category	C	<b>Construction</b>		
Budget	Wastewater			
Phase Status	Future Planned Start			
Contract No				
Cost Est Class				
Task Name	Start Date	Duration	End Date	
Scope Development	1/4/2018	180	7/3/2018	
Procurement	7/3/2018	172	12/22/2018	
Project Execution	12/23/2018	540	6/15/2020	
Project Closeout	6/16/2020	60	8/15/2020	

CIP Number: 214001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			5,000	2,000						7,000
2019		182	0	4,001	7,764	1,000	0	0	0	12,947

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  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** CSO RTB & SDF  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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 improvements of the CSO Systems. Another significant challenge of this program will be unforeseen conditions that may be encountered as facility inspections & condition assessments begin. For example, finding significant structural distress of a basin could lead to increase of budget or extension of timeline of improvements. Considering much of the equipment/systems identified for inclusion in this program are at or near obsolescence or are actively causing O&M issues, delays in improvements could possibly cause operational or compliance issues.

**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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



Electrical Duct Bank

**Project Significance:** Procure and install electrical power system to meet safety standards and provide 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	<b>Construction</b>				Contract No	PC-783	Phase Status	Pending Close-out
Phase Title	PC-783 Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	1,033							
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	1,033							

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	PC-783	
Cost Est Class		

**CIP Number: 216001**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	23,037	2,575	1,532							27,144
2019	30,564	1,072	1,033							32,669

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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



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	<b>Construction</b>				Contract No	PC-782	Phase Status	Closed Out
Phase Title	PC-782 Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	

PHASE	<b>Study and Design and Construction Assistance</b>				Contract No	CS-1443	Phase Status	Pending Close-out
Phase Title	CS-1443 Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Closed Out				
Contract No	PC-782				
		Task Name	Start Date	Duration	End Date
		Scope Development			

**CIP Number: 216002**

Cost Est Class		Task Name	Start Date	Duration	End Date
		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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	5,390	624								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  Innovation  
**Budget:** Wastewater  Water MP Right Sizing  
**Classification Lvl 1:** Wastewater  Reliability/Redundancy  
**Classification Lvl 2:** WRRF  
**Classification Lvl 3:** General Purpose  
**Project Location:** City of Detroit **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.

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		50	690	1,900	1,150	1,200				4,990

Description of CIP Changes

**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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score 82.2**



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							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	40	551	3,957	565	0	0	0	
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
	40	551	3,957	565	0	0	0	

**CIP Number: 216004**

**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	2/13/2018	180	8/12/2018
Project Execution	8/13/2018	600	4/4/2020
Project Closeout	4/4/2020	60	6/3/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			2,500	2,500						5,000
2019		312	40	551	3,957	565	0	0	0	5,425

Description of CIP Changes

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: Cancelled

Budget: Wastewater

Classification Lvl 1: Wastewater

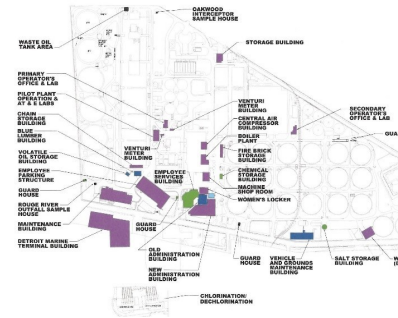
Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 60



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		
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	FY19	FY20	FY21	FY22	FY23	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



**CIP Number: 216005**

Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

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	8/7/2019	180	2/3/2020
Procurement	2/3/2020	220	9/10/2020
Project Execution	9/11/2020	1863	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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,500	6,000	5,400					12,900
2019			0	0	0	0	0	0	0	0

Description of CIP Changes

**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  
**Project Location:** City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score 78.6**



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.

**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

**CIP Number: 216006**

Phase Title	Rehabilitation of the Screened Final Effluent (SFE) Pump Station and Secondary Water System						
<b>Phase Total</b>	<b>FY18</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24 and Beyond</b>
	0	0	1,718	4,008	572	572	286

PHASE	<b>Construction</b>			Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of the Screened Final Effluent (SFE) Pump Station and Secondary Water System						
<b>Phase Total</b>	<b>FY18</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24 and Beyond</b>
	0	0	0	0	6,602	16,958	23,740

<b>FY18-Proj</b>	<b>FY19-Proj</b>	<b>FY20-Proj</b>	<b>FY21-Proj</b>	<b>FY22-Proj</b>	<b>FY23-Proj</b>	<b>FY24 and Beyond</b>
0	0	1,718	4,008	7,174	17,530	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	2/7/2020	660	11/28/2021
Procurement	11/30/2021	180	5/29/2022
Project Execution	5/30/2022	1080	5/14/2025
Project Closeout	5/15/2025	60	7/14/2025

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			
Procurement	7/1/2019	220	2/6/2020
Project Execution	2/7/2020	1923	5/14/2025
Project Closeout	5/15/2025	60	7/14/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,700	2,000	12,000	15,600	16,279	4,141		51,720
2019			0	0	1,718	4,008	7,174	17,530	24,026	54,456

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 82.8



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	0	2,002	1,326	3,326	0	0	0			
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
	0	2,002	1,326	3,326	0	0	0			

### Phase Tasks and Dates

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Future Planned Start				
Contract No					
Cost Est Class					
		Task Name	Start Date	Duration	End Date
		Scope Development	7/1/2017	400	8/5/2018
		Procurement	8/5/2018	180	2/1/2019
		Project Execution	2/2/2019	547	8/2/2020

**CIP Number: 216007**

Task Name	Start Date	Duration	End Date
Project Closeout	8/3/2020	60	10/2/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			3,500	3,500						7,000
2019		15	0	2,002	1,326	3,326	0	0	0	6,669

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

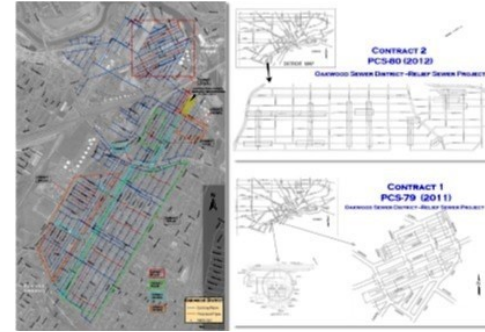
Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 51.8



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 between

**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	<b>Construction</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	4,589	8,920	17,651	

PHASE	<b>Study and Design and Construction Assistance</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	10	1,372	1,372	1,372	2,714	

CIP Number: 222001

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	10	1,372	5,961	10,292	20,365

**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	7/1/2019	728	6/28/2021
Procurement	6/28/2021	180	12/25/2021
Project Execution	12/25/2021	1275	6/22/2025
Project Closeout	6/22/2025	60	8/21/2025

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	7/1/2019	91	9/30/2019
Procurement	9/30/2019	272	6/28/2020
Project Execution	6/28/2020	1820	6/22/2025
Project Closeout	6/22/2025	60	8/21/2025

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018				550	2,750	5,500	2,200			11,000
2019			0	0	10	1,372	5,961	10,292	20,365	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 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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 65.4



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	Design and Build				Contract No	Con-183	Phase Status	Pending Close-out
Phase Title	Con-183 Detroit River Interceptor (DRI) Evaluation and Rehabilitation							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	2,232	0	0	0	0	0	0	

PHASE	Design and Build				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Future Projects for DRI under SRF Funding							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		1,084	8,052	10,187	10,187	10,187	2,491	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
2,232	1,084	8,052	10,187	10,187	10,187	2,491	

**Phase Tasks and Dates**

Phase Category	DB	<b>Design and Build</b>			
Budget	Wastewater				
Phase Status	Future Planned Start				
		Task Name	Start Date	Duration	End Date



**CIP Number: 222002**

Contract No	NA	<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Cost Est Class		Procurement	12/31/2017	272	9/29/2018
		Project Execution	9/29/2018	1248	2/28/2022
		Project Closeout	2/28/2022	30	3/30/2022

Phase Category	DB	<b>Design and Build</b>			
Budget	Wastewater	<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
Phase Status	Pending Close-out	Scope Development	10/1/2017	91	12/31/2017
Contract No	Con-183	Procurement	12/31/2017	272	9/29/2018
Cost Est Class		Project Execution	9/29/2018	1248	2/28/2022
		Project Closeout	2/28/2022	90	5/29/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		321	10,000	5,000	5,000					20,321
2019		5	2,232	1,084	8,052	10,187	10,187	10,187	2,491	44,425

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 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

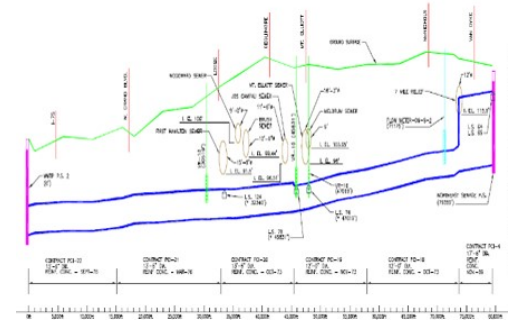
Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 65.4



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	10,120	11,130	2,760	0		
PHASE	Design				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	550	530	150	0		
PHASE	Study				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	330	340	90	0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		

**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			

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			
Procurement			
Project Execution			
Project Closeout			

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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			11,000	12,000	3,000					26,000
2019			0	0	0	11,000	12,000	3,000	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

Project Location: Multiple Counties

Innovation

Water MP Right Sizing

Reliability/Redundancy

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	<b>Construction</b>							Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System Valve Remote Operation Structures Improvements										
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	1,019	1,014	0	0	0	0				

PHASE	<b>Design</b>							Contract No	NA	Phase Status	Closed Out
Phase Title	Collection System Valve Remote Operation Structures Improvements										
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	0	0	0	0	0	0				

PHASE	<b>Study</b>							Contract No	NA	Phase Status	Closed Out
Phase Title	Collection System Valve Remote Operation Structures Improvements										
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	1,019	1,014	0	0	0	0	

**CIP Number: 222004**

**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	Closed Out
Contract No	NA
Cost Est Class	

**Design**

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	10	7/11/2018
Procurement	7/12/2018	90	10/10/2018
Project Execution	10/11/2018	81	12/31/2018
Project Closeout	12/31/2018	60	3/1/2019

Phase Category	S
Budget	Wastewater
Phase Status	Closed Out
Contract No	NA
Cost Est Class	

**Study**

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	10	7/11/2018
Procurement	7/12/2018	90	10/10/2018
Project Execution	10/11/2018	81	12/31/2018
Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			341	1,000	1,422					2,763
2019			341	1,019	1,014	0	0	0	0	2,374

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: Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 56.4

Project Significance: 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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	341	1,000	1,422	0	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
341	1,000	1,422	0	0	0	0	

Phase Tasks and Dates			
Phase Category	C		
Budget	Wastewater		
Phase Status	Future Planned Start		
Contract No	NA		
Cost Est Class			
<b>Construction</b>			
Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

CIP Number: 222005

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			3,196	2,000	2,001					7,197
2019			341	1,000	1,422	0	0	0	0	2,763

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  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** SCC  
**Classification Lvl 3:** Interceptors  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**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.

**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 Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.



Example inspection of a large sewer

**Project Status:** Future Planned  
**Budget:** Wastewater  
**Classification Lvl 1:** Wastewater  
**Classification Lvl 2:** Field Services  
**Classification Lvl 3:** Interceptors  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 72.8**

**Project Significance:** Rehabilitation and replacement program of the existing NIEA based upon structural deficiencies identified from the evaluation results. This is 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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	2,537	4,931	4,931	4,825		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	4	760	758	758	758	741		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	0	4	760	3,295	5,689	5,689	5,566		

Phase Tasks and Dates					
Phase Category	C	Construction			
Budget	Wastewater				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date

**CIP Number: 222007**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	6/28/2020	180	12/25/2020
		Project Execution	12/25/2020	1275	6/22/2024
		Project Closeout	6/22/2024	60	8/21/2024

Phase Category	D	<b>Design</b>
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	91	9/30/2018
Procurement	9/30/2018	272	6/29/2019
Project Execution	6/29/2019	1820	6/22/2024
Project Closeout	6/22/2024	90	9/20/2024

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			7,000	7,000	7,000					21,000
2019			0	4	760	3,295	5,689	5,689	5,566	21,003

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 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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Sanitary pumps at Fairview Pumping Station

Project Score

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	FY19	FY20	FY21	FY22	FY23	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	CS-1747 Fairview Pumping Station - Replace Four Sanitary Pumps							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	508	494	494	494	0	0	0	
	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	<b>Construction</b>			
Budget	Wastewater	Task Name	Start Date	Duration	End Date
Phase Status	Future Planned Start	Scope Development	4/27/2016	765	6/1/2018
Contract No	NA	Procurement	6/1/2018	92	9/1/2018
Cost Est Class		Project Execution	9/1/2018	761	10/1/2020

**CIP Number: 232001**

Task Name	Start Date	Duration	End Date
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	7/22/2015	124	11/23/2015
Procurement	11/23/2015	154	4/25/2016
Project Execution	4/25/2016	1620	10/1/2020
Project Closeout	10/1/2020	90	12/30/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	128	472	2,100	14,350	15,350					32,400
2019		778	508	12,094	14,414	3,974	0	0	0	31,768

Description of CIP Changes

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 79.6



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	PO-3785 Freud PS Imprvmts									
Phase Total										
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
					582	10,000	15,000			

CIP Number: 232002

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	181	1,192	0	223	1,000	1,000	0

PHASE	Construction	Contract No	CON-109	Phase Status	Active		
Phase Title	CON-109, Freud & Conner Creek Pump Station Improvements						
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	1,203	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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,384	1,192	0	223	1,582	11,000	15,000

**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
Scope Development	11/15/2016	15	11/30/2016
Procurement	9/30/2016	0	9/30/2016
Project Execution	9/30/2016	400	11/4/2017
Project Closeout	11/5/2017	44	12/19/2017

CIP Number: 232002

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

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	10/1/2018	60	11/30/2018
Procurement	12/1/2018	97	3/8/2019
Project Execution	3/9/2019	1140	4/22/2022
Project Closeout	3/25/2022	30	4/24/2022

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
Scope Development	9/14/2018	95	12/18/2018
Procurement	12/18/2018	122	4/19/2019
Project Execution	4/19/2019	1098	4/21/2022
Project Closeout	1/12/2022	215	8/15/2022

CIP Number: 232002

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		8,040	5,900	5,100	2,460	1,000				22,500
2019		2,101	1,384	1,192	0	223	1,582	11,000	15,000	32,482

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 89



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	10,920	13,000	0		
PHASE	Design				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	Northeast Pumping Station								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	1,628	0	0	0		
PHASE	Study				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	Northeast Pumping Station								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	780	0	0	0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	0	0	0	2,408	10,920	13,000	0		

**CIP Number: 232003**

**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			

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			
Procurement			
Project Execution			
Project Closeout			

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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			2,408	10,920	13,000					26,328
2019			0	0	0	2,408	10,920	13,000	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  Innovation  
**Budget:** Wastewater  Water MP Right Sizing  
**Classification Lvl 1:** Wastewater  Reliability/Redundancy  
**Classification Lvl 2:** SCC  
**Classification Lvl 3:** In System Devices  
**Project Location:** Multiple Counties **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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		
PHASE	Design				Contract No	NA	Phase Status	Future Planned Start	
Phase Title	Collection System Backwater Gates and Regulator Gates Rehabilitation								
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	0	0	0	0	0		

**CIP Number: 233001**

PHASE	<b>Study</b>	Contract No	NA	Phase Status	Future Planned Start		
Phase Title	Collection System Backwater Gates and Regulator Gates Rehabilitation						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	NA
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

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			
Procurement			
Project Execution			
Project Closeout			

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			

CIP Number: 233001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			1,301	3,000	3,000	2,000				9,301
2019			0	0	0	0	0	0	0	0

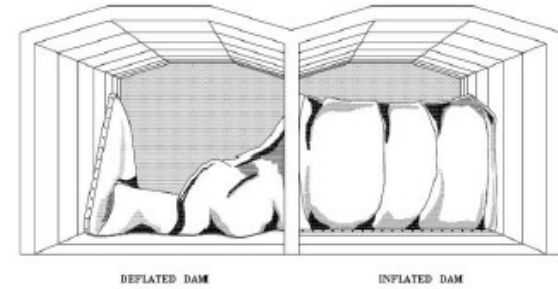
Description of CIP Changes

**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  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 50



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	<b>Construction</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System In System Storage Devices (ISDs) Improvement							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	300	2,000	1,000	0	0	

PHASE	<b>Design</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System In System Storage Devices (ISDs) Improvement							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	82	82	0	0	0	0	

PHASE	<b>Study</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System In System Storage Devices (ISDs) Improvement							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	82	382	2,000	1,000	0	0	

**CIP Number: 233002**

**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	7/26/2021	62	9/26/2021
Procurement	9/26/2021	180	3/25/2022
Project Execution	3/25/2022	910	9/20/2024
Project Closeout	9/20/2024	30	10/20/2024

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	12/29/2019	91	3/29/2020
Procurement	3/29/2020	272	12/26/2020
Project Execution	12/26/2020	1364	9/20/2024
Project Closeout	9/20/2024	30	10/20/2024

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	91	9/30/2018
Procurement	9/30/2018	272	6/29/2019
Project Execution	6/29/2019	183	12/29/2019
Project Closeout	12/29/2019	30	1/28/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			86	464	2,000	1,000				3,550
2019			86	82	382	2,000	1,000	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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Ovation hardware and screens

Project Score 70.2

**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								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	877	515	229	114	0	0		
PHASE	Construction					Contract No	Phase Status	Future Planned Start	
Phase Title	Wastewater System Wide Instrumentation & Control Software and Hardware Upgrade								
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	2,138	6,783	3,392	0	0		
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond		
	0	877	2,653	7,012	3,506	0	0		



**CIP Number: 251002**

**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	2/7/2019	450	5/2/2020
Procurement	5/4/2020	180	10/31/2020
Project Execution	11/1/2020	720	10/22/2022
Project Closeout	10/23/2022	60	12/22/2022

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			
Procurement	7/1/2018	220	2/6/2019
Project Execution	2/7/2019	1353	10/22/2022
Project Closeout	10/23/2022	60	12/22/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018						3,125	2,737			5,862
2019			0	877	2,653	7,012	3,506	0	0	14,048

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

**Budget:** Wastewater

**Classification Lvl 1:** Wastewater

**Classification Lvl 2:** Programs

**Classification Lvl 3:** Programs

**Project Location:** Multiple Counties

Innovation

Water MP Right Sizing

Reliability/Redundancy

**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				
<b>Phase Total</b>					
PHASE	Construction	Contract No	SCP-PC-010	Phase Status	Closed Out
Phase Title	SCP-PC-010 Toolos Contracting - Replace Various Air Distribution Equip 260105				
<b>Phase Total</b>					
PHASE	Construction	Contract No		Phase Status	Closed Out
Phase Title	260102 RFP 44380 Titus Welding Co - Replace Stairs - WRRF				
<b>Phase Total</b>					

**CIP Number: 260100**

PHASE	<b>Construction</b>				Contract No	SCP-PC-014	Phase Status	Pending Close-out
Phase Title	SCP-PC-014 Ferndale Electric Emergency Lighting - 260101							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	1,040	0	0	0	0	0	0	
PHASE	<b>Construction</b>				Contract No	SCP-PC-016G	Phase Status	Pending Close-out
Phase Title	SCP-PC-016G, Z Contractors Inc, Neff Road Pumping Station Flowmeter Replacement - 260108							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	0	0	0	0	0	0	
PHASE	<b>Study and Design and Construction Assistance</b>				Contract No		Phase Status	Future Planned Start
Phase Title	Unallocated S/D/CA - WRRF, Lift Station and Wastewater Collection System Structures Allowance							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	100	100	100	200	200	200	0	
PHASE	<b>Construction</b>				Contract No		Phase Status	Future Planned Start
Phase Title	Unallocated Construction - WRRF, Lift Station and Wastewater Collection System Structures Allowance							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	1,000	1,000	1,000	2,000	2,000	2,000		
PHASE	<b>Construction</b>				Contract No		Phase Status	Closed Out
Phase Title	260104, RFB 46149, Installation of EB-25 Unit Substation at Incinerator Complex II, WRRF							
<b>Phase Total</b>								
PHASE	<b>Construction</b>				Contract No		Phase Status	Pending Close-out
Phase Title	260107, Pump Station 2 Replacement							
<b>Phase Total</b>								
PHASE	<b>Construction</b>				Contract No		Phase Status	Closed Out
Phase Title	260109, RFB-46533, Weiss Construction, Rehab Valve Remote Flow Control Facility							
<b>Phase Total</b>								
PHASE	<b>Construction</b>				Contract No	SCP-PC-015	Phase Status	Future Planned Start
Phase Title	SCP-PC-015, SCP-PC-015, W-3 Construction, Overhead Door - 260111							
<b>Phase Total</b>								

**CIP Number: 260100**

PHASE	<b>Construction</b>				Contract No	DWS-065	Phase Status	Pending Close-out
Phase Title	DWS-065, Tooles, Connor Creek CSO Control Facility Access Hatches 260112							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	55							

PHASE	<b>Construction</b>				Contract No		Phase Status	Active
Phase Title	260113, Walsh Construction, WRRF Fire Remediation							
<b>Phase Total</b>								

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
2,195	1,100	1,100	2,200	2,200	2,200	0	

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>
Budget	Wastewater	
Phase Status	Active	
Contract No		
Cost Est Class		

Phase Category	C	<b>Construction</b>
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	DWS-065	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	12/5/2016	210	7/3/2017
Project Closeout	7/3/2017	60	9/1/2017

Phase Category	C	<b>Construction</b>
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	SCP-PC-015	
Cost Est Class		

**CIP Number: 260100**

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	
Cost Est Class	

**Construction**

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	
Cost Est Class	

**Construction**

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	
Cost Est Class	

**Construction**

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	10/16/2017	260	7/3/2018
Procurement	10/3/2018	120	1/31/2019
Project Execution	2/1/2019	1550	5/1/2023
Project Closeout	5/5/2023	60	7/4/2023

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	SCP-PC-016G
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	4/22/2016	360	4/17/2017
Project Closeout	4/17/2017	200	11/3/2017

**CIP Number: 260100**

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	SCP-PC-014
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	5/25/2016	581	12/27/2017
Project Closeout	12/27/2017	30	1/26/2018

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	
Cost Est Class	

**Construction**

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	SCP-PC-010
Cost Est Class	

**Construction**

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	
Cost Est Class	

**Construction**

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	10/16/2017	260	7/3/2018
Procurement	7/3/2018	210	1/29/2019
Project Execution	1/30/2019	1550	4/29/2023
Project Closeout	4/29/2023	60	6/28/2023

CIP Number: 260100

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		5,587	12,000	12,000	15,000	15,000	12,000			71,587
2019	2,024	12,734	2,195	1,100	1,100	2,200	2,200	2,200	0	25,753

Description of CIP Changes

CIP Number: 260200

Old CIP No.: 1263

Project Title: Sewer and Interceptor Rehabilitation Program

Project Status: Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



An example interceptor

**Project Significance:** Rehabilitation and replacement program of the existing sewers and interceptors based upon structural deficiencies identified from the revaluation results. This replacement, rehabilitation and cleaning program is 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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	494	1,201	1,000	0	0	0	0		
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	1,000	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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	57	0	0	0	0	0	0		



**CIP Number: 260200**

PHASE	<b>Construction</b>				Contract No	NA	Phase Status	Future Planned Start
Phase Title	UNALLOCATED, Sewer and Interceptor Evaluation and Rehabilitation Program							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
		2,000	2,000	11,400	11,400	11,400	11,400	

PHASE	<b>Study and Design and Construction</b>				Contract No	CON-149	Phase Status	Active
Phase Title	CON-149, Emergency Sewer Repair							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	6,200	7,400	7,400					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
7,751	10,601	10,400	11,400	11,400	11,400	11,400	

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Phase Category	C	<b>Construction</b>																				
Budget	Wastewater																					
Phase Status	Pending Close-out																					
Contract No	CS-068																					
Cost Est Class																						
		<table border="1"> <thead> <tr> <th>Task Name</th> <th>Start Date</th> <th>Duration</th> <th>End Date</th> </tr> </thead> <tbody> <tr> <td>Scope Development</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Procurement</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project Execution</td> <td>10/25/2016</td> <td>730</td> <td>10/25/2018</td> </tr> <tr> <td>Project Closeout</td> <td>10/25/2018</td> <td>60</td> <td>12/24/2018</td> </tr> </tbody> </table>	Task Name	Start Date	Duration	End Date	Scope Development				Procurement				Project Execution	10/25/2016	730	10/25/2018	Project Closeout	10/25/2018	60	12/24/2018
Task Name	Start Date	Duration	End Date																			
Scope Development																						
Procurement																						
Project Execution	10/25/2016	730	10/25/2018																			
Project Closeout	10/25/2018	60	12/24/2018																			

Phase Category	S/D/C	<b>Study and Design and Construction</b>												
Budget	Wastewater													
Phase Status	Active													
Contract No	CON-149													
Cost Est Class														
		<table border="1"> <thead> <tr> <th>Task Name</th> <th>Start Date</th> <th>Duration</th> <th>End Date</th> </tr> </thead> <tbody> <tr> <td>Project Execution</td> <td>7/14/2017</td> <td>1096</td> <td>7/14/2020</td> </tr> <tr> <td>Project Closeout</td> <td>7/14/2020</td> <td>60</td> <td>9/12/2020</td> </tr> </tbody> </table>	Task Name	Start Date	Duration	End Date	Project Execution	7/14/2017	1096	7/14/2020	Project Closeout	7/14/2020	60	9/12/2020
Task Name	Start Date	Duration	End Date											
Project Execution	7/14/2017	1096	7/14/2020											
Project Closeout	7/14/2020	60	9/12/2020											

**CIP Number: 260200**

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PO-005030
Cost Est Class	

**Study and Design and Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/25/2016	674	6/30/2018
Project Closeout	6/30/2018	60	8/29/2018

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-168
Cost Est Class	

**Study and Design and Construction Assistance**

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		2,612	8,000	8,000	20,000	20,000	20,000			78,612
2019		3,397	7,751	10,601	10,400	11,400	11,400	11,400	11,400	77,749

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

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy



Aerial view of the WRRF

Project Score

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	FY19	FY20	FY21	FY22	FY23	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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	0	0	200	200	200	200				
PHASE	Construction							Contract No		Phase Status	Future Planned Start
Phase Title	UNALLOCATED: Scheduled Replacement Program of Critical Assets										
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	0	0	0	2,000	2,000	2,000	2,000				
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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond				
	161	0	0	0	0	0	0				

CIP Number: 260300

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,172	0	0	2,200	2,200	2,200	2,200

**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			
Project Closeout	7/1/2018	1825	6/30/2023

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	7/24/2017	143	12/14/2017
Project Closeout	12/14/2017	60	2/12/2018

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	7/1/2018	1825	6/30/2023
Project Closeout			

CIP Number: 260300

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	5,000	5,000	5,000	5,000	5,000			25,500
2019		56	2,172	0	0	2,200	2,200	2,200	2,200	11,028

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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score



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	CON-179 Sewage Meter Design, Installation, Replacement and Rehabilitation Program							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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								

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	<b>Design and Construction</b>
Budget	Wastewater	
Phase Status	Active	
Contract No		
Cost Est Class		

**CIP Number: 260400**

Phase Category	S/D/C
Budget	Wastewater
Phase Status	Active
Contract No	CON-179
Cost Est Class	

**Study and Design and Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/8/2017	1095	8/7/2020
Project Closeout	8/7/2020	60	10/6/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		500	500	500	500	500	500			3,000
2019			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  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 72.8



Sewer tap piping in B009 outfall (left) and sludge buildup and poor masonry in B007 outfall (right)

**Project Significance:** PROJECTS 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, Regulator Gates Rehabilitation and CSO Access Hatch Improvements							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	6	2,825	7,845	5,824			

PHASE	Construction				Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated General CSO Outfall Rehabilitation							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond	
	0	501	1,001	2,156	4,177	10,001	10,001	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	507	3,826	10,001	10,001	10,001	10,001

**Phase Tasks and Dates**

Phase Category	C	<b>Construction</b>			
Budget	Wastewater				
Phase Status	Future Planned Start	Task Name	Start Date	Duration	End Date



**CIP Number: 260500**

Contract No	NA	Task Name	Start Date	Duration	End Date
Cost Est Class		Procurement	9/30/2018	546	3/29/2020
		Project Execution	3/29/2020	730	3/29/2022
		Project Closeout	3/29/2022	90	6/27/2022

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Phase Category	C	<b>Construction</b>
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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			6,000	6,000	6,000	6,000	6,000	6,000		36,000
2019			0	507	3,826	10,001	10,001	10,001	10,001	44,337

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

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 90.6



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 complete the following: Needs Assessment, Condition Assessment, and update to the 2013 Scheduled Replacement Plan (SRP); Replacement of CSO Facilities Fire Alarm Systems; Structural Condition Assessment Design/Build project; and flushing improvements to Baby Creek CSO Facility. A direct product of the Needs/Condition Assessment and SRP is identification of facility needs with projects identified, prioritized, and conceptual cost estimates. From this output, RFP's will be developed to address these needs. For this purpose, Design and Construction dollars have been identified in the later years of this Program to facilitate design and construction of those identified needs. It is anticipated that 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/condition assessment. Following completion of the Wastewater Master Plan, new projects may be otherwise defined which will be incorporated into the CIP. These projects will likely be entered into the CIP as stand-alone projects rather than falling under this program. Furthermore, upon completion of the NPDES permit, new regulatory requirements may arise which require capital improvements. Depending on the nature of those improvements, they may be stand-alone projects or fall within the elements of this Program.

**Challenges:** As this program starts off, there is a lot of design RFPs in the beginning which will lead to la refined projects aimed at improving operations, which lead to RFPs for design and 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 improvements of the CSO Systems. Another significant challenge of this program will be unforeseen conditions that may be encountered as facility inspections & condition assessments begin. For example, finding significant structural distress of a basin could lead to increase of budget or extension of timeline of improvements. Considering much of the equipment/systems identified for inclusion in this program are at or near obsolescence or are actively causing O&M issues, delays in improvements could possibly cause operational or compliance issues.

Phase Expenses				
PHASE	Design and Construction	Contract No	Phase Status	Future Planned Start
Phase Title	TRD - S/D/CA/C			

CIP Number: 260600

Phase Title	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
<b>Phase Total</b>	0	2,456	4,951	2,351	4,351	9,351	11,251
<b>PHASE Construction</b>				Contract No	CON-144	Phase Status	Pending Close-out
Phase Title	CON-144 - Rehabilitation of CSO RTB's						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	726	0	0	0	0	0	0
<b>PHASE Study and Design and Construction Assistance</b>				Contract No	CS-145	Phase Status	Pending Close-out
Phase Title	CS-145 - S/D/Ca for Improvements to the CSO RTB's						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	139	0	0	0	0	0	0
<b>PHASE Construction</b>				Contract No	DWS-065	Phase Status	Pending Close-out
Phase Title	DWS-065 - Rehabilitation of CSO RTB's (Replaces CIP1313)						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	0	0	0	0	0	0	0
<b>PHASE Design &amp; Construction Assistance</b>				Contract No	CS-172	Phase Status	Active
Phase Title	CS-172 - Conner Creek CSO RTB Automation Improvements						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	114	0	0	0	0	0	0
<b>PHASE Design &amp; Construction Assistance</b>				Contract No	CS-116	Phase Status	Active
Phase Title	CS-116 - Rehabilitation of Conner Creek CSO RTB Effluent Launder Gates & Emergency Relief Gates						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	114	103	49	0	0	0	0
<b>PHASE Construction</b>				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-						
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond
	565	6,718	1,218				
	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	1,658	9,277	6,218	2,351	4,351	9,351	11,251

Phase Tasks and Dates	
Phase Category	C
Budget	Wastewater
	<b>Construction</b>

**CIP Number: 260600**

Phase Status	Future Planned Start
Contract No	CON-234
Cost Est Class	

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			
Procurement			
Project Execution			
Project Closeout			

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			
Procurement			
Project Execution	2/28/2017	275	11/30/2017
Project Closeout	11/30/2017	60	1/29/2018

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			
Procurement	5/1/2018	220	12/7/2018
Project Execution	12/8/2018	1863	1/14/2024
Project Closeout	1/14/2024	60	3/14/2024

**CIP Number: 260600**

Phase Category	D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-116
Cost Est Class	

**Design & Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	2/27/2017	730	2/27/2019
Project Closeout	2/27/2019	60	4/28/2019

Phase Category	D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-172
Cost Est Class	

**Design & Construction Assistance**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/1/2017	153	12/1/2017
Project Closeout	12/1/2017	60	1/30/2018

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			
Procurement			
Project Execution	3/21/2017	285	12/31/2017
Project Closeout	12/31/2017	60	3/1/2018

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		3,520	2,247	6,400	9,000	7,200	3,610			31,977
2019		764	1,658	9,277	6,218	2,351	4,351	9,351	11,251	45,221

**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 8 of the CSO Facilities (excepting Oakwood - minor repairs) because those systems are not functional, or long since obsolete at this time requiring a lot of maintenance to stay in service. For FY20-FY22, the 2018 CIP identified various unallocated dollars in the CIP; however, no specific projects or improvements were not identified and subsequent RFPs to begin those projects were not developed. Therefore, the expected costs for those FY's has decreased to allow time over the next year or so to complete a full-scale Condition Assessment, Needs Assessment, and Update of the 2013 Scheduled Replacement Plan. Projects resulting out of the NA, CA, and SRP are expected to begin hitting the CIP construction dollars beginning in FY23. This allows time for RFP and RFB procurement periods as well as

development of RFPs and subsequent design phases of a typical project. There are also anticipated improvements for structural condition assessment anticipated to occur over the next 2 Fys as a design/build project, and improvements to the Baby Creek Facility largely expected to be designed in FY 20 and FY21 and constructed in FY 22 and FY23. The time between allows for scope development, RFP, design, and RFB phases of a project before it begins construction. As other items such as the Master Plan and NPDES Permit come to, new projects will be identified aimed at achieving regulatory or other goals identified, which will ultimately affect CIP dollars later in the defined CIP period. During the time of completing a thorough condition assessment/needs assessment document for proper planning and execution of capital improvements, other emergent projects may arise as identified under the challenges section of this BCE.

## 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  
**Project Location:** Multiple Counties

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score 61**



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	128	169	809	1,243	4,844		
FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond			
0	0	128	169	809	1,243	4,844			

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	10/1/2018	91	12/31/2018
	Procurement	12/31/2018	272	9/29/2019



**CIP Number: 331001**

Task Name	Start Date	Duration	End Date
Project Execution	9/29/2019	2793	5/23/2027
Project Closeout	5/23/2027	90	8/21/2027

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		3,000	3,000	3,000	2,500					11,500
2019			0	0	128	169	809	1,243	4,844	7,193

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  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score** 43.8



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.

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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond		
	0	0	652	5,461	5,000	0	0		

**CIP Number: 331002**

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	FY19	FY20	FY21	FY22	FY23	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	5,575	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	3/9/2019	360	3/3/2020
Procurement	3/4/2020	180	8/31/2020
Project Execution	9/1/2020	720	8/22/2022
Project Closeout	8/22/2022	60	10/21/2022

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	1/1/2018	90	4/1/2018
Procurement	4/1/2018	220	11/7/2018
Project Execution	11/8/2018	1383	8/22/2022
Project Closeout	8/22/2022	60	10/21/2022

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			2,200	2,060	1,060	1,050	540	2,140		9,050
2019			0	286	709	5,575	5,114	0	0	11,684

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

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score 60.8



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	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	2	1,172	1,600	0	0	0	0			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond				
2	1,172	1,600	0	0	0	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	5/21/2017	40	6/30/2017
Procurement	8/8/2017	150	1/5/2018
Project Execution	1/5/2018		
Project Closeout			

CIP Number: 351001

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018			933	933	933					2,799
2019			2	1,172	1,600	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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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	PC-773C Consolidated Process Control System Upgrades							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	PC-773D Consolidated Process Control System Upgrades							
<b>Phase Total</b>	FY18	FY19	FY20	FY21	FY22	FY23	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	
0	0	0	0	0	0	0	

**Phase Tasks and Dates**

Phase Category	DB	<b>Design and Build</b>			
Budget	Wastewater				
Phase Status	Pending Close-out				
Contract No	PC-773D				
		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Scope Development			

**CIP Number: 361001**

Cost Est Class		<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
		Procurement			
		Project Execution			
		Project Closeout			

Phase Category	DB	<b>Design and Build</b>
Budget	Water	
Phase Status	Pending Close-out	
Contract No	PC-773C	
Cost Est Class		

	<b>Task Name</b>	<b>Start Date</b>	<b>Duration</b>	<b>End Date</b>
	Scope Development			
	Procurement			
	Project Execution			
	Project Closeout			

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	3,928	640								4,568
2019	203	118	0	0	0	0	0	0	0	321

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

Project Location: City of Detroit

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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	DWS-881 Data Center Reliability/Availability Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	DWS-881 Data Center Reliability/Availability Improvements							
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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	
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			



CIP Number: 361002

		Task Name	Start Date	Duration	End Date
		Project Closeout			

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Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	DWS-881				
Cost Est Class					

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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	6,003	10								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

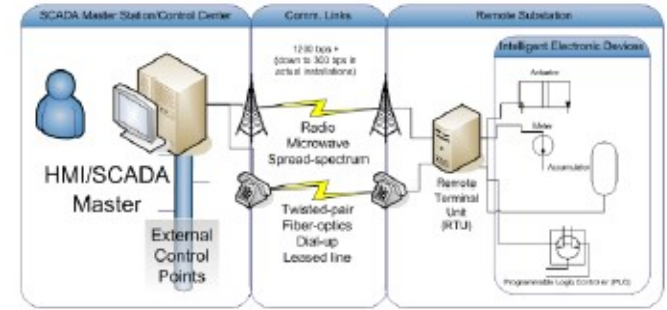
**Classification Lvl 2:** Engineering

**Classification Lvl 3:** General Purpose

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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-882	Phase Status	Pending Close-out
Phase Title	DWS-882 SCADA Radio Network Upgrade									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	FY24 and Beyond			
	60	0	0	0	0	0	0			

PHASE	Design and Build						Contract No	DWS-882	Phase Status	Pending Close-out
Phase Title	DWS-882 SCADA Radio Network Upgrade									
Phase Total	FY18	FY19	FY20	FY21	FY22	FY23	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				
60	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			

**CIP Number: 361003**

		Task Name	Start Date	Duration	End Date
		Project Closeout			

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Phase Category	DB	<b>Design and Build</b>			
Budget	Water				
Phase Status	Pending Close-out				
Contract No	DWS-882				
Cost Est Class					

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	1/1/2017	1	1/2/2017
Project Closeout	1/3/2017	90	4/3/2017

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	6,221	218								6,439
2019	867	452	60	0	0	0	0	0	0	1,379

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

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



**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

**Phase Expenses**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond	
250	803	803	803	0	0	0	
250	803	803	803				

Phase Tasks and Dates	
Phase Category	S/D/CA
Budget	Water
Phase Status	Under Procurement
Contract No	CS-166

**Study and Design and Construction Assistance**

**CIP Number: 380400**

Cost Est Class

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Under Procurement
Contract No	CS-166
Cost Est Class	<input type="text"/>

**Study and Design and Construction Assistance**

Phase Category	S/D/CM
Budget	Wastewater
Phase Status	Closed Out
Contract No	CS-1433
Cost Est Class	<input type="text"/>

**Study and Design and Construction Management**

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	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	4,770	1,400	100							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  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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:**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	114	91	0	0	0	0

**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	1/9/2020	60	3/9/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	10,065	228	228							10,521
2019	282		114	114	91	0	0	0	0	601



**CIP Number: 380500**

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  
**Project Location:** City of Detroit

Innovation  
 Water MP Right Sizing  
 Reliability/Redundancy

**Project Score**



**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

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
170	51	50				
236	276	0	0	0	0	0

Phase Tasks and Dates	
Phase Category	D
Budget	Wastewater
Phase Status	Active
Contract No	CS-1432A
Cost Est Class	
	Design
Phase Category	D
Budget	Water
Phase Status	Active
Contract No	CS-1432A
Cost Est Class	
	Design

CIP Number: 380600

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	14,011	446	436	386						15,279
2019	316		406	327	50	0	0	0	0	1,099

Description of CIP Changes

**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

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**



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

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
238	477	477	477	238	0	0

**Phase Tasks and Dates**

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	CS-1488
Cost Est Class	

**Construction**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	6/1/2016	1429	4/30/2020
Project Closeout	5/1/2020	90	7/30/2020

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		650	907	333	333	333				2,557
2019	230		238	477	477	477	238	0	0	2,137

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

**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**Project Score**

**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



Example of a pipe being laid

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
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CS-1490
Cost Est Class	

**Design**

Phase Category	D
Budget	Water
Phase Status	Pending Close-out
Contract No	CS-1490
Cost Est Class	

**Design**

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			



CIP Number: 380800

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	2,441	132								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  
**Budget:** Wastewater  
**Classification Lvl 1:** Centralized Services  
**Classification Lvl 2:** Programs  
**Classification Lvl 3:** Programs  
**Project Location:** Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

**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

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
572	916	425	0	0	0	0

Phase Tasks and Dates	
Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-1481
Cost Est Class	

Study and Design and Construction Assistance			
Task Name	Start Date	Duration	End Date
Project Closeout	3/28/2021	60	5/27/2021

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018	28	1,250	1,154							2,432
2019	138		572	916	425	0	0	0	0	2,051

Description of CIP Changes

CIP Number: 381000

Old CIP No.: 1343

Project Title: Energy Management: Electric Metering Improvement Program

Project Status: Active

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Project Location: Multiple Counties

- Innovation
- Water MP Right Sizing
- Reliability/Redundancy

Project Score

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:



Example of an electric meter

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	60	60	255	439	2,186
0	0	60	60	255	439	2,186

**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	7/1/2018	91	9/30/2018
Procurement	9/30/2018	1182	12/25/2021
Project Execution	12/25/2021	2370	6/21/2028
Project Closeout	6/21/2028	90	9/19/2028

**CIP Number: 381000**

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	7/1/2018	91	9/30/2018
Procurement	9/30/2018	1182	12/25/2021
Project Execution	12/25/2021	2370	6/21/2028
Project Closeout	6/21/2028	90	9/19/2028

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

CIP Version	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Total
2018		1,000	1,000	1,000	1,000	1,000	1,000			6,000
2019			0	0	120	120	510	878	4,372	6,000

Description of CIP Changes

The electric metering improvement program BCE has been fully evaluated causing the need to delay the start of the program to ensure the ability to fully implement, ensure adequate and appropriate planning and to ensure adequate time to procure the highest quality consultant/contractor to assist in implementation of this program.

## VIII. GLOSSARY

BCE.....	Business Case Evaluations	I&E .....	Improvement & Extension
BDF .....	Biosolids Dryer Facility	IDF.....	Intermediate Distribution Facilities
BFP.....	Belt Filter Press	IGA .....	Investment Grade Audit
BGD.....	Billion Gallons per Day	ILP.....	Intermediate Lift Pumps
BPS.....	Booster Pumping Station	ISD.....	In System Storage Device
CB .....	Construction Bond	IT.....	Information Technology
CCR.....	Consumer Confidence Rule	ITS.....	Information Technology and Services
CCTV.....	Closed-Circuit Television	IWC.....	Industrial Waste Control
cfs .....	cubic feet per second	LCR.....	Lead and Copper Rule
CIP.....	Capital Improvement Plan	LED .....	Light-Emitting Diode
CMG .....	GLWA Capital Management Group	LEL.....	Lower Explosive Limit
COF .....	Central Offload Facility	LIMS/PIMS .....	Laboratory Information Management System/Project Information Management System
CSF .....	Central Services Facility	LH WTP.....	Lake Huron Water Treatment Plant
CSO.....	Combined Sewer Overflow	MACP.....	Manhole Assessment Certification Program
CTA .....	Common To All	MBO .....	Master Bond Ordinance
CWA.....	Clean Water Act	MCC.....	Motor Control Centers
DDOT.....	Detroit Department of Transportation	MDEQ.....	Michigan Department of Environmental Quality
DE .....	Debt Eligible	MDF .....	Main Distribution Facilities
DI .....	Ductile Iron	MG .....	Million Gallons
DRI.....	Detroit River Interceptor	MGD.....	Million Gallons per Day
DRO.....	Detroit River Outfall	NAB.....	New Administration Building at the WRRF
dtpd .....	dry tons per day	NASSCO .....	National Association of Sewer Service Companies
DWRF.....	Drinking Water Revolving Fund	NE WTP.....	Northeast Water Treatment Plant
DWSD.....	Detroit Water and Sewerage Department	NEC .....	National Electric Code
DWSD-R.....	Specifying the new, Detroit-focused Detroit Water and Sewerage Department	NESDS.....	Northeast Sewerage Disposal System
EPA .....	United States Environmental Protection Agency	NIEA .....	North Interceptor East Arm
GIS.....	Geographic Information System	NPDES.....	US EPA National Pollutant Discharge Elimination System
GLWA.....	Great Lakes Water Authority	NPL .....	US EPA National Priorities List
GPS.....	Global Positioning System		
HVAC.....	Heating, Ventilation, and Air Conditioning		
I&C .....	Instrumentation & Controls		

O&M.....	Operations & Maintenance	SDF.....	Screening and Disinfection Facility
OEM.....	Original Equipment Manufacturer	SDWA.....	Safe Drinking Water Act
O-NWI.....	Oakwood-Northwest Interceptor	SFE.....	Secondary Final Effluent
OSHA.....	Occupational Safety and Health Administration	SFP.....	Sludge Feed Pump
OWI.....	Oakwood Interceptor	SOW.....	Scope of Work
PAC.....	Powdered Activated Carbon	SPW WTP.....	Springwells Water Treatment Plant
PACP.....	Pipeline Assessment Certification Program	SRP.....	Scheduled Replacement Program
PCCP.....	Pre-Stressed Concrete Cylinder Pipe	SW WTP.....	Southwest Water Treatment Plant
PEAS.....	Primary Effluent to Activated Sludge	T&O.....	Taste and Odor
PLC.....	Programmable Logic Controller	TAC.....	Technical Advisory Committee
PLD.....	Programmable Logic Device	TCR.....	Total Coliform Rule
PRV.....	Pressure Reducing Valve	TPC.....	Tournament Players Championship Golf Course in Dearborn
PS.....	Pump Station	VFD.....	Variable Frequency Drive
RAS.....	Return Activated Sludge	VR-Gates.....	Valve Remote Gates
RRO.....	Rouge River Outfall	WAM.....	Work and Asset Management
RRO-2.....	Rouge River Outfall No. 2	WMP.....	Water Master Plan
RTB.....	Retention Treatment Basins	WMPU.....	Water Master Plan Update
RVSDS.....	Rouge Valley Sewerage Disposal System	WRRF.....	Water Resource Recovery Facility
RWCS.....	Regional Water Transmission System	WSC.....	West Service Center
SAMO.....	GLWA System Analytics and Meter Operations	WTP.....	Water Treatment Plant
SCADA.....	Supervisory Control And Data Acquisition (GLWA uses Ovation brand)	WWP WTP.....	Water Works Park Water Treatment Plant
SCC.....	Systems Control Center	WWTP.....	Wastewater Treatment Plant (old terminology)
SCP.....	Small Capital Projects		
SCUBA actuators ..	Self-Contained Universal Bi-directional Actuator		



## **IX. APPENDICES**

- Appendix A ..... Water Business Case Evaluations
- Appendix B ..... Sewer Business Case Evaluations
- Appendix C..... Centralized Services Business Case Evaluations