



CIP

2024-2028

CAPITAL IMPROVEMENT PLAN

Updated January 19, 2023

Approved February 22, 2023

**Appendix F: Additional Reference
Material: How to Navigate the CIP**

Pump Station 1 Ferric Chloride Storage Tank #3

Photo submitted by: Khoder Daher of Wastewater Operating Services

**Water Works Park Water Treatment Plant Yard Piping, Valves, and
Venturi Meters Replacement**

Photo submitted by: Jacob Magnum of Water and Field Services



APPENDIX F

1.1. KEY FEATURES

PROJECT STATUS DESCRIPTION

To determine a particular project’s 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 status are provided in Table 1 below. Projects that have been newly introduced into the CIP this year have been designed as “New to the CIP” based upon a checkmark within the Business Case Evaluation.

Table 1. Project Status Descriptions

Project Status	Description
Active - Pre-Procurement - Construction	The RFB (and other supporting documents) are in development.
Active - Pre-Procurement - Design	The RFP (and other supporting documents) are in development.
Active - Procurement - Board Approved - Construction	The negotiated terms and conditions with the successful bidder have gone to the board and been approved but a contract has not yet been executed.
Active - Procurement - Board Approved - Design	The negotiated terms and conditions with the successful bidder have gone to the board and been approved but a contract has not yet been executed.
Active - Procurement - Construction	An RFB (and other required documentation) have been submitted to the Procurement group for solicitation of proposals.
Active - Procurement - Design	An RFP (and other required documentation) have been submitted to the Procurement group for solicitation of proposals.
Active - Procurement - Negotiation Phase - Construction	The lowest responsible bidder for contract labor services has been notified to begin negotiations.

Project Status	Description
Active - Procurement - Negotiation Phase - Design	The highest responsible scored bidder for professional services has been notified to begin negotiations.
Cancelled	Project that has been completely cancelled and removed from the CIP.
Closed	Project that has been officially completed.
Future Planned - Beyond Ten Years	Future Planned - Beyond Ten Years
Future Planned - Ten Year CIP	Project Pushed out to years 6-10
Future Planned - Within Five Year Plan	Project that was included in the previous CIP and does not have an assigned BS and A Project Number.
Project Execution - Construction	There is a fully executed contract for the active phase
Project Execution - Design	There is a fully executed contract for the active phase
Project Execution - Pending Closeout	A Project that has an assigned BS and 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.
Reclassified	Project that has been merged into the scope of work of an existing project.

PHASE CATEGORIES

Projects are broken up into several phases related to how the 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. Several categories may exist for each phase. In this case, the assumption is 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
- PM - Project Management
- TBD - To Be Determined

CIP TYPES

CIP types are necessary to distinguish the differences in intent of how a CIP item is to be used. This CIP contains two primary CIP types: Projects and Programs. A typical project that has a specific scope and timeframe is considered a project. Whereas programs do not have specifically developed scopes and typically extend over many years. Last year there was an additional CIP type, Table 2 defines each CI

1.2 REPORT FORMAT

The 2024-2028 CIP format maintains the consistent layout of the 2023-2027 CIP document.

VARYING DEGREES OF PROJECT DETAIL

Within the document, projects and programs are 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, and

Note: 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.

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 a specific service area. One-page summaries of each project gives 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 2. CIP Types

Project 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.

REVISED PROJECT CATEGORIES & NUMBERING

The revised categorization methodology and numbering and sequencing of CIP projects and programs introduced in the 2023-2027 CIP is continued in the 2024-2028 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 GLWA's financial system.

As in the FY 2023-2027 CIP, projects within programs are assigned a CIP number within that program. This is required within the BS&A Financial system to accurately track and report expenses incurred. In the FY 2024- 2028 CIP, these project “carve outs” are identified as individual projects under the programs.

This numbering is based on the “smart” numbering system as identified in **Table 3** on the following page.

GENERAL PURPOSE

The General Purpose category within Project Category 2 and Project Category 3 in Table 3 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.

PROGRAMS

Programs consist of the replacement and/or rehabilitation of specific capital asset(s) 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. 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 to allow up to 99 separate projects to be attributable to each program. These projects identified under a parent program will be issued a CIP number and will be identified as a project under the parent program.

Table 3. 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	
1XX-Water		112 - Northeast	
1XX-Water		113 - Southwest	
1XX-Water		114 - Springwells	
1XX-Water		115 - Water Works Park	
1XX-Water		116 - General Purpose	
1XX-Water	12X - Field Services	121 - General Purpose	
1XX-Water		122 - Transmission System	
1XX-Water	13X - Systems Control Center	131 - General Purpose	
1XX-Water		132 - Pump Stations & Reservoirs	
1XX-Water	14X - Water Quality	141 - General Purpose	
1XX-Water	15X - Metering	151 - General Purpose	
1XX-Water	16X - General Purpose	161 - General Purpose	
1XX-Water	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	
	27X – CSO Facilities	270 - Multiple CSO facilities	
		271 - Puritan Fenkell	
		272 - Seven Mile	
		273 - Hubbell Southfield	
		274 - Leib	
		275 - St. Aubin	
		276 - Conner Creek	
		277 - Baby Creek	
		278 - Oakwood	
		279 - Belle Isle	
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	

CIP AND BUSINESS UNIT OVERVIEW

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.

PROJECT RISK MATRIX

Project risks are identified specifically related to their Probability of Failure (PoF) and Consequence of Failure (CoF) and portrayed on an overall Risk Matrix. The overall criteria remain unchanged, however, 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 criterion as primary risk driver is shown in **Table 4**.

After each criterion 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 in **Figure 1**.

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

Table 4. Risk Criteria

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

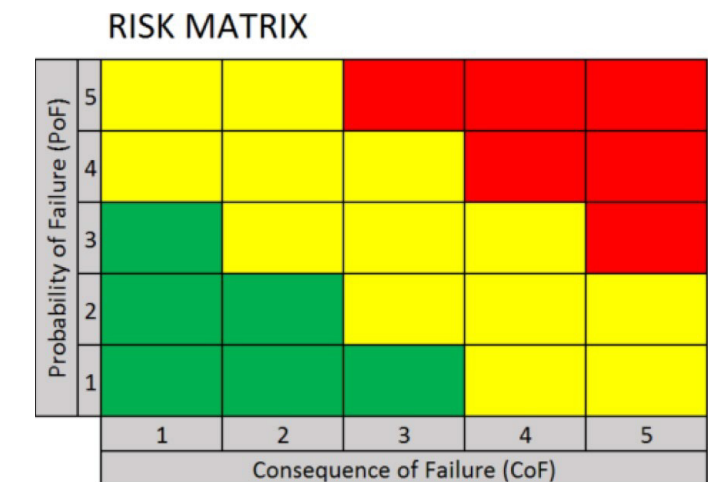


Figure 1. Risk Matrix

COST ESTIMATION CLASSIFICATIONS

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 5. AACE Cost Estimate Classes

Estimate Class	Project Definition	End Usage	Method	Average Expected Range	Accuracy
Class 5	0% to 2%	Screening or feasibility	Judgement, trend analysis, parametric	120%	-60%
Class 4	1% to 5%	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%

INNOVATION, MASTER PLAN, REDUNDANCY & NE WTP RELATED PROJECTS

Several areas of interest have been identified and can be seen in Chapter 2 These areas are:

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

PROGRAM PROJECTS

Projects that were performed under programs were identified by the CIP group and issued a CIP number. These projects have been derived from the outcome of their parent program. The CIP number associated with these projects is numerically relevant to the parent CIP number. To better portray this relationship in the CIP, these projects are identified as projects under the parent CIP program.

PROJECT YEAR-TO-YEAR COMPARISON

To compare a project’s 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

PROJECT SCHEDULE

A significant benefit for stakeholders associated with GLWA’s CIP process is related to the information provided for project scheduling. Starting with the 2019 CIP, most projects 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.

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