

GLWA's FY 2019 - 2023 Capital Improvement Plan

*GLWA Board Workshop Meeting
February 14, 2018, 1:00 p.m.*



OVERVIEW: What is the Capital Improvement Plan?

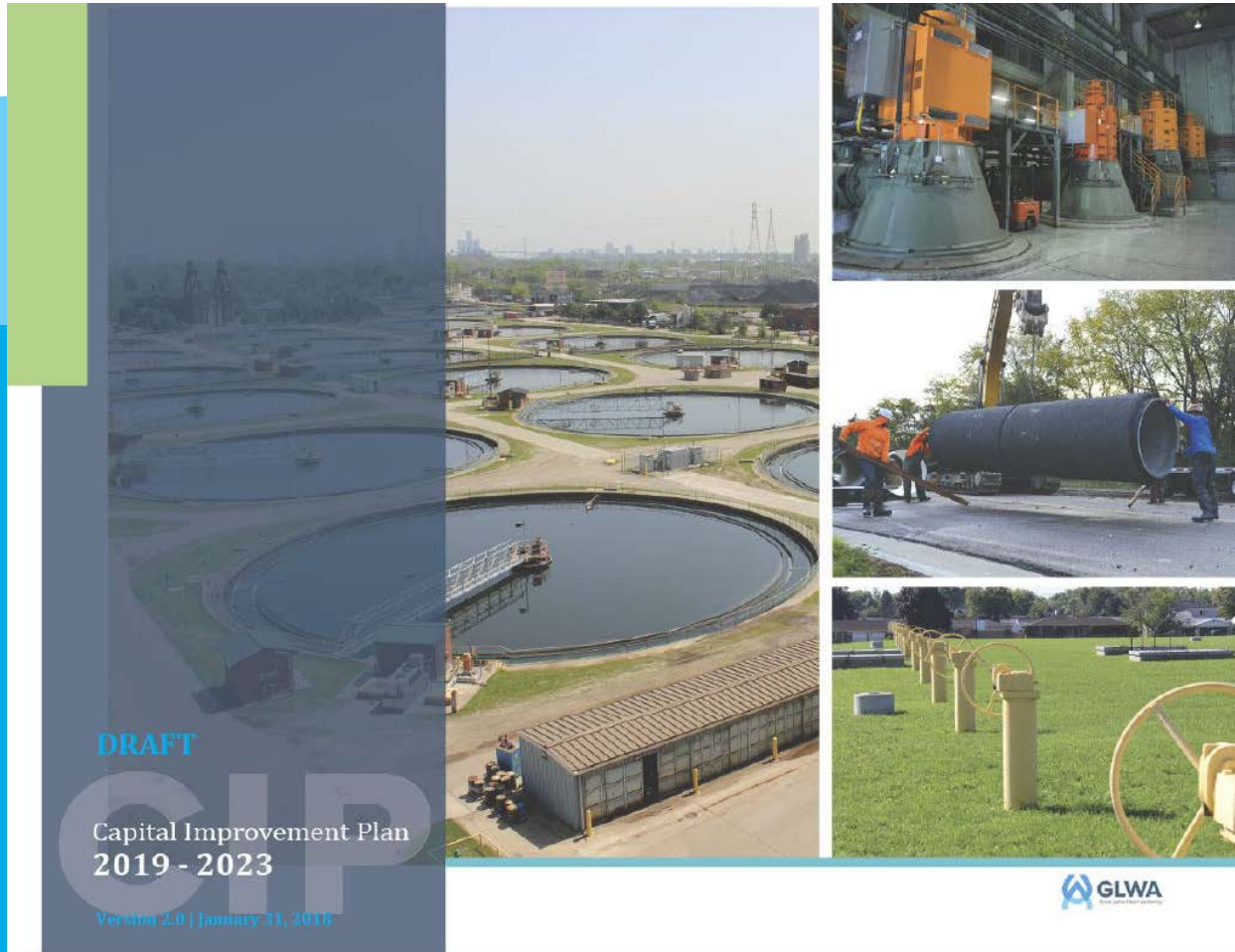
- Five year planning document
- Requires alignment with our overall Financial Plan
- Includes large new projects or effectively gives new useful life for long-lived assets
- Long-lived means the asset has a useful life greater than 20 years
- Compilation of projects from all areas of the organization
- Used by Financial Services Area to understand when we need to issue bonds

OVERVIEW: What We Are Trying to Accomplish


- Increased redundancy, reliability & resiliency of water and wastewater systems
- Adherence with long-term planning document recommendations
- Provide opportunity for Board, Authority Members and stakeholders to provide input
- Best-in-class planning and execution of capital program
 - Efficient & effective spending
 - Planning of human resource needs
 - Planning of financial resource needs



New CIP Features



DRAFT
Capital Improvement Plan
2019 - 2023
Version 2.0 | January 31, 2018



NEW CIP FEATURES

- Robust Business Case Evaluation for all projects
- Identification of project schedule by phase
- Project projected expense year-to-year comparison
- Project phase cost estimate type identification

Phase Task Info subform

Task Name	Start Date	Duration	End Date	Phase	ID	id_Phase Task
Scope Development	1/8/2019	83	4/1/2019	1	30	1
Procurement	4/2/2019	209	10/28/2019	1	31	2
Project Execution	10/29/2019	1665	5/20/2024	1	32	3
Project Closeout	5/21/2024	83	8/12/2024	1	33	4
*					(New)	(New)

1,000s OF DOLLARS

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		100	600	12,150	11,780					24,630
2019	\$1	\$252	567	10453	10436	4593	0	0	0	26,302

AACE Cost Estimate Classes		
Estimate Class	Project Definition	Method
Class 5	0% to 2%	Judgement, trend analysis, parametric
Class 4	1% to 15%	Expert opinion, trend analysis, more parametric
Class 3	10% to 40%	Combinations of detailed, unit cost, activity-based + class 4 & 5 methods
Class 2	30% to 70%	Primarily deterministic
Class 1	50% to 100%	Deterministic

NEW CIP FEATURES (Cont'd)

- Further expansion of the project prioritization & risk matrix

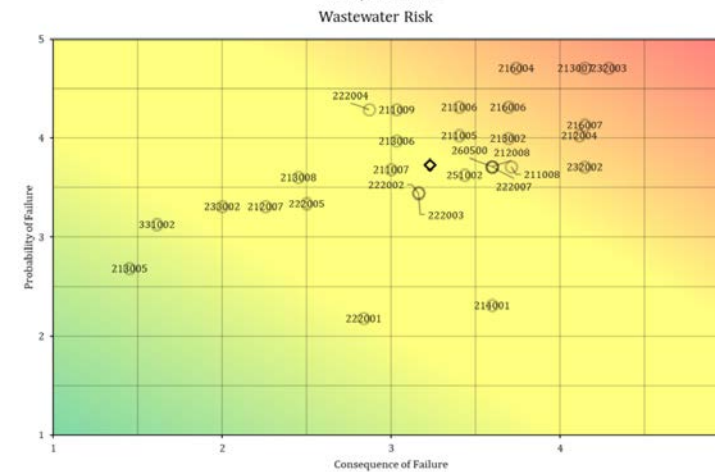
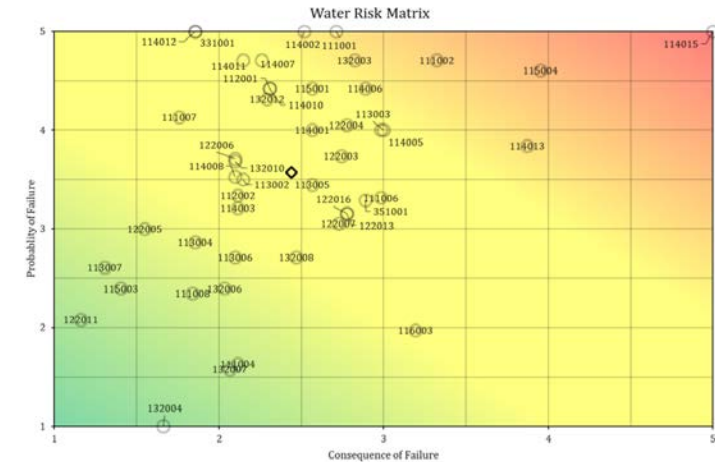
SECTION 1 PROJECT MANAGER CRITERIA SCORES: WATER

Rank	OP No.	Title	Score
1	114015	SPW WTP Emergency Gating Replacement	114015
2	115004	VWV WTP Chlorine System Upgrade	115004
3	114013	SPW WTP Reservoir Fill Line Improvements	114013
4	111002	LH WTP Miscellaneous Mechanical HVAC Improvements	111002
5	115001	LH WTP Low and High Lift Pumping, Filter Backwash Pumps...	115001
6	118001	West Service Center PS - Isolation Gate Valves for Low Range	118001
7	114006	SPW WTP Replacement of Rapid Mix three 1950 Process Trains	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 Bldg Imps & Underground Fire Protection Loop	114005
11	115001	VWV WTP Valve Piping, Valves and Venturi Motors Replacement	115001
12	122004	St. Jack Valve Rehabilitation, Isolation Valve Installation, and ...	122004
13	114007	SPW WTP Focused 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	113006	LH WTP Filter Instrumentation - Raw Water Flow Metering...	113006
17	114001	SPW WTP 1950 Filter Rehabilitation and Auxiliary Facilities	114001
18	114010	SPW WTP Valve Piping and High Lift Pumps Improvements	114010
19	112001	NE WTP Valve Piping Replacement (Gate Valve Rehab)	112001
20	122012	Spillout PS Improvements	122012
21	113001	Boiling Systems Replac. at Water Plants & Recycle Pump Station	113001
22	114012	SPW WTP Water Treatment Plant 1950 Filter Building-Roof...	114012
23	351001	Water Facility Lighting Renovations	351001
24	122013	14 Mile Transmission Main Loop	122013
25	122016	Doverport Transmission Main Loop	122016
26	113005	SW WTP Feedback Management	113005
27	122007	Hanson Road Transmission Main	122007
28	116003	Genesee and Lapeer County Transmission System Improvements	116003
29	122006	Transmission System Water Main Work-Walk Road Parallel Water...	122006
30	122010	West Service Center PS - Dual 60 Division Valve Upgrade	122010
31	113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	113002

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

SECTION 3 PROJECT MANAGER CRITERIA SCORES: WASTEWATER

Rank	OP No.	Title	Score
1	212003	Northwest Pumping Station	212003
2	211001	WRRF Modifications to Industrial Discharge Feed Systems at Complex II	211001
3	216007	ITC Primary Effluent Solid Feed Supply to WRRF	216007
4	216004	Rehabilitation of Various Sampling Sites and FMR2 Ferric Chloride	216004
5	212004	WRRF Chlorination and Disinfection Process Equipment Improvements	212004
6	212002	Fossil & Casser Creek Pump Station Improvements	212002
7	216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural...	216006
8	211002	WRRF Rehabilitation of Central Offload Facility	211002
9	211006	WRRF PS No. 1 Improvements	211006
10	211008	WRRF Rehabilitation of Ferric Chloride Feed Systems to PS-1 and Complex...	211008
11	212006	WRRF Rehabilitation of Inverse Osmosis Lift Pumps (ILP)	212006
12	211005	WRRF PS No. 2 Improvements Phase II	211005
13	240500	CSO Outlet Rehabilitation	240500
14	222007	NRA Evaluation and Rehabilitation from WRRF to Greiner Ave. and...	222007
15	211001	WRRF Rehabilitation of the Circular Primary Clarifier Screen Removal...	211001
16	251002	Waterworks 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 Bar Arms (NIBA) Evaluation and Rehabilitation	222003
21	211007	WRRF PS #2 Bar Rack Replacements and Grit Collection Systems...	211007
22	211001	WRRF Rehabilitation of Industrial Water Control Structures and...	211001
23	211001	Rehabilitation of the Water Plant Maintenance Building &...	211001
24	211008	WRRF Rehabilitation of the Ash Handling Systems	211008
25	212007	WRRF Rehabilitation of the Secondary Clarifiers	212007
26	222001	Gishwood District Intercommunity Relief Sewer Modification at Oakwood...	222001



NEW CIP FEATURES (Cont'd)

New Tables:

Tables	Water Projects	Wastewater Projects
Five year project totals greater than \$30M	3	7
FY2019 totals greater than \$5M	1	7
Master plan right-sizing projects	10	0
Projects with possible innovative solutions/process	3	16
Redundancy and Reliability projects	25	50
Projects necessary for Northeast Water Treatment Plant Repurposing	6	0

NEW CIP FEATURES (Cont'd)

Projects Identified By Physical Jurisdiction:

Jurisdiction	Water Projects	Wastewater Projects	Centralized Services Projects
City of Detroit	17	54	3
Lapeer County	2	0	0
Macomb County	1	0	0
Oakland County	10	0	0
Saint Clair County	9	0	0
Wayne County (Outside Detroit)	37	0	0
Multiple Counties	21	0	12

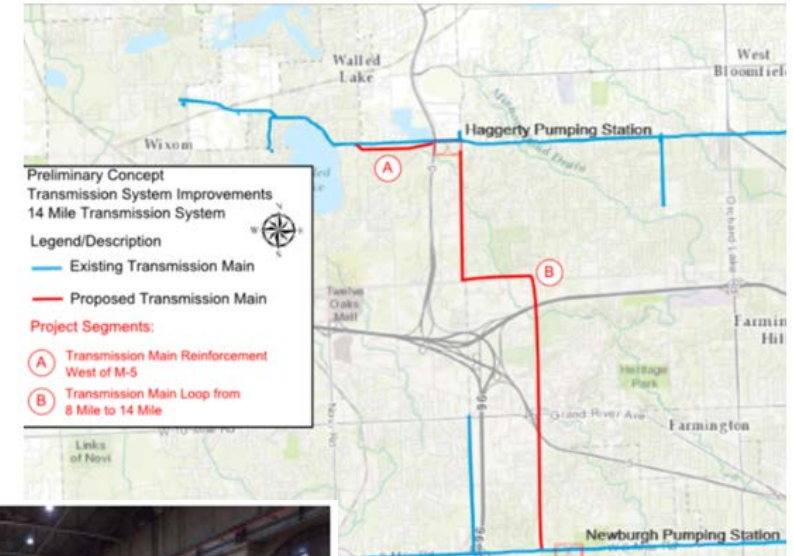
A dynamic splash of clear blue water against a white background, with various droplets and streams of water captured in motion. The water is bright blue and highly reflective.

Highlighted CIP Projects



Criteria Used to Select Highlighted Water Projects

- Decommissioning treatment at Northeast Water Treatment Plant
- Right-sizing water system capacity
- Improving water transmission system redundancy
- Increasing water system reliability



Spotlight on Projects - WATER

NEW CIP #	Project Title	Project Total (\$1,000's)	Project Start Date	Project Completion Date
114002	Springwells WTP Low Lift and High Lift Pump Station	\$85,503	2/1/2017	8/31/2026
114013	Springwells WTP Reservoir Fill Line Improvements	\$6,508	11/8/2015	7/29/2020
115003	Water Works Park WTP Comprehensive Condition Assessment	\$546	7/1/2017	6/30/2020
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	\$33,079	2/14/2017	4/17/2023
122003	Water Works Park WTP to Northeast WTP Transmission Main	\$130,879	10/7/2018	12/30/2024
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main	\$132,667	7/22/2017	10/17/2025
122013	14 Mile Transmission Main Loop	\$54,426	9/1/2018	5/29/2026
122016	Downriver Transmission Main Loop	\$37,197	12/31/2018	2/17/2026
132010	West Service Center Pump Station - Duval Rd Division Valve Upgrades	\$37,136	9/8/2018	12/1/2023
132012	Ypsilanti Pump Station Improvements	\$9,147	4/28/2018	12/1/2023

Strategy In Wastewater Engineering Project Selection

- Add redundancy where prudent and/or economical
- Improve reliability to maintain compliance
- Increase process efficiency



Spotlight on Projects - WASTEWATER


NEW CIP #	Project Title	Project Total (\$1,000's)	Project Start Date	Project Completion Date
211005	WRRF Pump Station No. 2 Improvements Phase II	\$22,087	11/1/2019	11/14/2025
211006	WRRF Pump Station No. 1 Improvements	\$24,120	4/2/2018	4/16/2025
212008	WRRF Rehabilitation of Intermediate Lift Pumps	\$20,516	4/1/2019	4/14/2025
214001	WRRF Relocation of Industrial Waste Control Division and Analytical Laboratory Operations	\$12,947	7/3/2018	8/15/2020
216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station	\$54,456	7/1/2019	7/14/2025
216007	DTE Primary Electric 3rd Feed Supply to WRRF	\$6,669	8/5/2018	10/2/2020
222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	\$38,000	9/30/2019	8/21/2025
260200	Sewer and Interceptor Rehabilitation Program	\$77,749	Ongoing	Ongoing
260500	Combined Sewer Overflow Outfall Rehabilitation	\$44,337	9/30/2018	6/27/2022
260600	Combined Sewer Overflow Facilities Improvement Program	\$45,221	5/1/2018	3/14/2024

2019 – 2023 CIP PROJECT STATISTICS

Project Statistics:

System	Existing Projects (Active, Future Planned, Pending Close-out)	New Projects	Total FY 2019-2023
Water Projects	63	26	89
Wastewater Projects	50	1	51
Centralized Services Projects	8	0	8
Total:	121	27	148

CIP Alignment With The Financial Plan



GLWA
Great Lakes Water Authority

**FY 2018 and FY 2019 Biennial Budget
& Five Year Financial Plan
FY 2018 through FY 2022**



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		
Water							
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%
Grand Total	\$ 66,038	\$ 137,583	\$ 155,734	\$ 178,300	\$ 175,174	\$ 712,829	100%

Cost Allocation	Projected Capital Expenditures					Total FYs 2019-2023	Percent of Five Year Total
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023		
Wastewater							
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%
Grand Total	\$ 105,183	\$ 111,155	\$ 111,952	\$ 136,411	\$ 168,458	\$ 633,159	100%

Capital Outlay vs. Capital Improvement Plan

Category	Capital Outlay < \$5,000	Capital Outlay > \$5,000	Capital Outlay > \$5,000 – Specific I&E	Capital Improvement Plan – Strategic I&E	Capital Improvement Plan - Bonds
Funding Source	Operations & Maintenance	Operations & Maintenance	Improvement & Extension Fund	Improvement & Extension Fund	Construction Bond Fund
Rationale	Tagged and tracked for internal asset control purposes (not capitalized)	Efficiencies in budget control and procurement	Isolate items that cause variability in the annual financial plan that do not meet the criteria for CIP	Lower the cost of capital by funding the CIP with Revenue Financed Capital versus bond financing	Constructed Assets
Frequency	Recurring in nature	Recurring in nature	Unique, nonrecurring, purchases, and/or large dollar assets on a replacement program	Project specific	Project Specific
Life	> One Year	> One Year	> One Year	> 20 years	> 20 years
Examples	Tools, Smartboards, Small Equipment	Pumps, motors, and equipment	Vehicles, large equipment, security and information technology systems	Infrastructure, plant, and facility upgrade, rehabilitation, and/or replacement	Infrastructure, plant, and facility upgrade, rehabilitation, and/or replacement
Justification	Internal review panel	Internal review panel, prioritization, replacement validation with asset records	Internal review panel, prioritization, replacement validation with asset records	Business Case Evaluation; Internal Review Panel; Customer Outreach; GLWA Board Committee	Business Case Evaluation; Internal Review Panel; Customer Outreach; GLWA Board Committee
Procurement Impact	Low – recurring in nature; shorter lead time to bid	Low – recurring in nature; shorter lead time to bid	Medium – specialized resources; additional lead time for RFx; may need evaluation panel	High - specialized resources; additional lead time for RFx; evaluation panel required	High - specialized resources; additional lead time for RFx; evaluation panel required

Life of Asset – Basis for Optimizing Resources

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		
Water							
<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%
Grand Total	\$ 66,038	\$ 137,583	\$ 155,734	\$ 178,300	\$ 175,174	\$ 712,829	100%

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		
Wastewater							
<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%
Grand Total	\$ 105,183	\$ 111,155	\$ 111,952	\$ 136,411	\$ 168,458	\$ 633,159	100%

Estimating Likelihood of Spend

Phase Status	Projected Capital Expenditures		Projected Capital Expenditures				Total FYs 2019-2023
	FY 2019	Status as % of Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	
Water							
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%	-	-	-	-	-
Grand Total	\$ 66,038	100%	\$ 137,583	\$ 155,734	\$ 178,300	\$ 175,174	\$ 712,829

Phase Status	Projected Capital Expenditures		Projected Capital Expenditures				Total FYs 2019-2023
	FY 2019	Status as % of Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	
Wastewater							
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
Grand Total	\$ 105,183	100%	\$ 111,155	\$ 111,952	\$ 136,411	\$ 168,458	\$ 633,159

Construction vs. Soft Costs (Water)

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		
Water							
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%
Grand Total	\$ 66,038	\$ 137,583	\$ 155,734	\$ 178,300	\$ 175,174	\$ 712,829	100%

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

Construction vs. Soft Costs (Sewer)

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

Phase Status	Projected Capital Expenditures					Total FYs	Category as a
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	2019-2023	Percent of Total FYs 2019-2023
Wastewater							
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%
Grand Total	\$ 105,183	\$ 111,155	\$ 111,952	\$ 136,411	\$ 168,458	\$ 633,159	100%

Strategic vs Specific Use of I&E Funds

- ✓ Striking the balance between bond proceeds and revenue financed capital will lower the cost of capital over the long-term.
- ✓ Revenue financed capital is budgeted for use only after it is received to minimize financial plan risk.
- ✓ When I&E funds are assigned to offset a portion of the costs of specific capital expenses, a transfer is made from the I&E Fund to the Construction Bond Fund.
- ✓ “Transfers from I&E Transfers” are labeled as specific or strategic.
 - “Specific” transfers relate to specifically identified projects (general soft costs for services at the study or design phase).
 - “Strategic” relates to outlining the potential use of Revenue Financed Capital to lower the amount of revenue bonds.
- ✓ Measuring this effort over time will inform stakeholders of the effectiveness of this approach.

Water CIP - Financial Plan

Financial Plan - Sources and Uses of Capital Spending						
Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Water Construction Bond Fund						
Revenue (Sources)						
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	-
Total Revenue (Sources)	10,315	13,915	156,671	92,973	171,532	157,507
Expenses (Uses)						
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
Total Expenses (Uses)	40,043	66,038	137,583	155,734	178,300	175,174
Increase/(Decrease) in Reserves	(29,728)	(52,123)	19,088	(62,761)	(6,768)	(17,667)
Beginning Net Position	173,000	143,272	91,149	110,237	47,476	40,708
Ending Net Position	\$ 143,272	\$ 91,149	\$ 110,237	\$ 47,476	\$ 40,708	\$ 23,041

Sewer System – Financial Plan

Financial Plan - Sources and Uses of Capital Spending						
Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Wastewater (Sewage Disposal) Construction Bond Fund						
Revenue (Sources)						
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
Total Revenue (Sources)	49,774	50,808	122,438	169,819	26,233	167,767
Expenses (Uses)						
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
Total Expenses (Uses)	70,632	105,183	111,155	111,952	136,411	168,458
Increase/(Decrease) in Reserves	(20,858)	(54,375)	11,283	57,867	(110,178)	(691)
Beginning Net Position	136,000	115,142	60,767	72,050	129,917	19,739
Ending Net Position	\$ 115,142	\$ 60,767	\$ 72,050	\$ 129,917	\$ 19,739	\$ 19,048

Questions





GLWA

Great Lakes Water Authority

Have a Great Day!