

Budget Narrative

Summary: The following tables and explanations are in support of non-federal matched funds expected to be expended over the course of the project.

A: Personnel (Non-Federal Match) – Total Estimated Cost (\$9,842,100)

The personnel required to administer and manage the work supported by this award are presented in Tables 1 & 2 below. The estimated budget costs for this project are comprised of the following positions 28 positions listed in **Table 1** below. This consists of both those currently employed as well as those positions that would be added to support this project. New positions are denoted with an asterisk (*) next to the title.

The table denotes the position title, current estimated salary, the average percentage of time devoted to the project, and the Total Estimated Cost over the five-year period.

Based on the size of the project a significant effort will be made to staff the new positions timely, pursuing experienced candidates as well as more recent graduate professionals from local universities and disadvantaged communities.

The salaries used for each position are within the organization's current salary structure and are at a level that would attract and retain individuals with the talent necessary to achieve the goals of the project. A 2% annual salary adjustment is anticipated for each position currently staffed with a similar adjustment recognized for the duration of the project.

In addition to these positions, an apprenticeship program is anticipated with twenty new apprentices who will learn wastewater treatment operations and maintenance that will support the process upon startup and commissioning. The apprenticeship program will be conducted in two separate cohorts with 10 individuals each. As the future workforce, these apprentices will learn the new , thermal hydrolysis and anaerobic digesters alongside their experienced journey-workers. Cost: Two cohorts of 10 each. 20% staffing costs for two years for each cohort,

Further, a community liaison... as described in section 4 with 10 summer interns in engineering, project management or other STEM position. 80% of the cost. 18 weeks, two summers (5 interns each summer)

Table 1 outlines the positions need to administer and manage activities for this project.

New (*)	Position	2024 Annual Salary/Rate	Average Level of Effort	Expected Cost
	(1) CEO	\$190,000	6%	\$73,600
	(2) Director of Research	\$154,000	17%	\$155,500
	(3) Project Director	\$169,500	29%	\$331,900
	(4) Project Leads	\$154,000	76%	\$746,000
	(5) Project Leads	\$127,400	51%	\$436,700
	(6) Project Leads	\$154,000	34%	\$360,200

New (*)	Position	2024 Annual Salary/Rate	Average Level of Effort	Expected Cost
	(7) Grant Coordinator	\$127,400	24%	\$231,600
*	(8) Grant Compliance Management Professional	\$98,600	55%	\$340,600
*	(9) Professional Administrative Assistant	\$80,500	76%	\$383,700
*	(10) Professional Administrative Assistant	\$80,500	60%	\$307,900
	(11) Life Cycle Project Manager	\$135,200	88%	\$740,600
	(12) Technical Manager	\$119,400	54%	\$425,200
*	(13) Management Professional	\$96,200	82%	\$489,100
*	(14) Management Professional	\$96,200	50%	\$289,000
	(15) Director of Operation	\$154,000	58%	\$588,900
	(16) Operations Manager	\$119,400	58%	\$456,800
	(17) Team Leader	\$75,300	49%	\$274,000
*	(18) Team Leader	\$75,300	49%	\$274,000
*	(19) Team Leader	\$75,300	49%	\$274,000
*	(20) Team Leader	\$75,300	49%	\$274,000
*	(21) Management Professional - Accountant	\$99,300	51%	\$316,800
*	(22) Management Professional - Accountant	\$99,300	40%	\$249,900
*	(23) Procurement Specialist	\$67,700	12%	\$45,700
*	(24) Asset Management Mgt Professional	\$99,300	50%	\$352,200
	(25) Associate General Council	\$127,700	10%	\$66,700
*	(26) HR Generalist	\$86,050	32%	\$146,200
*	(27) Management Professional - Community Outreach	\$96,200	48%	\$280,200
	(28) OD Manager	\$127,400	10%	\$13,000
	(29) HRG-Apprentice	\$37,000	13%	\$33,000
	(30) Management Professional - Workforce Dev Plan	\$96,200	9%	\$60,500
*	(31) Infrastructure Administrator	\$107,100	81%	\$550,000
	(32) Plant Technician Apprentices - 10 X 2 Groups	\$51,900	15%	\$230,000
	(33) Summer Interns - 10 Stem university students	\$14,400	18%	\$44,600
				\$9,842,100

The description of each position is included in **Table 2** below.

Table 2 below shows the relationship of each position to the project.

Position	Relationship to the project
(1) CEO	Outreach meetings to public & member partners no less than annually during regularly scheduled meetings conducted by Great Lakes Water Authority
(2) Director of Research	Identifying and reviewing selected treatment technologies.
(3) Project Director	Executive oversight of project delivery and operational team.
(4) Project Leads	Provide engineering resources and quality assurance/quality control to the project delivery team.
(5) Project Leads	Provide instrumentation and control resources and quality assurance/quality control to the project delivery team.
(6) Project Leads	Provide IT and OT resources and quality assurance/quality control to the project delivery team.

Position	Relationship to the project
(7) Grant Coordinator	Ensure compliance with grant funding requirements and reporting.
(8) Grant Compliance Management Professional	Assist Grant Coordinator in compliance of grant funding requirements and reporting. Including completing reporting documents and tracking expenditures on grant.
(9) Professional Administrative Assistant	Project Documentation inclusive of changes to construction documents, pay application and
(10) Professional Administrative Assistant	Project Documentation
(11) Life Cycle Project Manager	Leadership of project delivery team, management of design and construction contracts, review of project deliverables, payment applications, submittals, change orders, and contract closeout.
(12) Technical Manager	Subject matter expertise in support of LPM - Anaerobic digestion & gas capture
(13) Management Professional	Pay application review, contract changes and change orders, project coordination & system commissioning
(14) Management Professional	Project schedule review/management
(15) Director of Operation	Provide operational direction to ensure compliance with our current and future NPDES permit. Coordination with regulators for permitting
(16) Operations Manager	Provide operations onsite during design and receive the project for commissioning and startup
(17) Team Leader	Provide resources and quality assurance/quality control to the construction inspection team. Involved with startup and commissioning
(18) Team Leader	Provide resources and quality assurance/quality control to the construction inspection team. Involved with startup and commissioning
(19) Team Leader	Provide resources and quality assurance/quality control to the construction inspection team. Involved with startup and commissioning
(20) Team Leader	Provide resources and quality assurance/quality control to the construction inspection team. Involved with startup and commissioning
(21) Management Professional - Accountant	CIP Expense accruals, financial budget amendments, project cost reviews, monitor AP invoice approvals, vendor communications, project capitalization and closeout
(22) Management Professional - Accountant	CIP Expense accruals, financial budget amendments, project cost reviews, monitor AP invoice approvals, vendor communications, project capitalization and closeout
(23) Procurement Specialist	Lead procurement of project equipment, materials, and services
(24) Asset Management Mgt Professional	Ensure the recording of newly constructed assets are cataloged and added to the organizations enterprise asset management system with appropriate maintenance schedules
(25) Associate General Council	Develop, negotiate and review contracts and changes
(26) HR Generalist	Recruits, hires, and oversees internship program development and execution. Develops relationships with local colleges for recruiting and placement purposes with a focus on DEIA recruiting and hiring.
(27) Management Professional - Community Outreach	GLWA will add a Community Outreach professional to its Public Affairs Group. This individual will engage and educate the community on the project and its positive impact on the community; listen to community concerns and facilitate the involvement of those potentially affected; lead and perform the planning and scheduling for community events and other activities; cultivate community relationships; and serve as the bridge between GLWA and the community.
(28) OD Manager	Oversight of workforce development initiatives, team member upskilling, apprenticeship and internship programs.
(29) HRG-Apprentice	Works with operations, apprentice partners, and other programs to fill 100% of available slots for new and existing apprenticeship programs with qualified candidates. Works with MI Works agencies to obtain support services for apprentices and to obtain grants to offset cost of apprenticeship.
(30) Management Professional - Workforce Dev Plan	Works with operations, union, and education partners to develop new, and update existing apprenticeships. Oversees community outreach to high schools, MI Works agencies and community colleges for career exploration initiatives. Will work with the Management Professional - Community Outreach any community workforce development initiatives.
(31) Infrastructure Administrator	Oversight of networking project into the controls system and ensuring the organizations cyber security standards are maintained

Position	Relationship to the project
(32) Plant Technician Apprentices - 10 X 2 Groups	On the job learning (OJL): Learns from skilled journeyworkers how to perform duties in wastewater treatment operations including but not limited to process operation and analysis, equipment maintenance, process sampling and analysis, and various cleaning duties. Will learn new biosolids process and the impact on air quality. Related Training Instruction (RTI): completes coursework from education partner and OWI to understand theory and practical applications and problem solving for operations and maintenance.
(33) Summer Interns - 10 Stem university students	Interns with engineering and science disciplines will learn selected treatment technologies; assist management professionals, life cycle project managers, and technical managers in project delivery; and assist with the recording of newly constructed assets.

B: Fringe Benefits (Non-Federal Match) – Total Estimated Cost (\$3,463,000)

The estimated budgeted costs for fringe benefits are comprised of the following. The table are based on number to team members.

Component	Rate	Cost
FICA	7.65%	\$752,800
Workers Compensation	0.85%	\$83,700
Insurances	17.12%	\$1,685,000
Retirement	9.00%	\$885,700
State Unemployment	2.70%	\$48,000
Federal Unemployment	0.60%	\$7,800
		\$3,463,000

C: Travel (Non-Federal Match) – Total Estimated Cost \$ 0

All travel will be included in the project cost by the third-party contractor for this project. GLWA does not anticipate any direct travel associated with this project.

D: Equipment (Non-Federal Match) – Total Estimated Cost \$ 0

All equipment purchase will be through the third-party contractor for this project. GLWA does not anticipate any direct equipment purchases associated that would be directly related to this project.

E: Supplies (Non-Federal Match) – Total Estimated Cost \$ 0

All supplies for this project will be include in the project cost by the third-party contractor for this project. GLWA does not anticipate any direct specific supplies associated that would be directly related to this project.

F: Contractual (Non-Federal Match) – Total Estimated Cost (\$157,243,200)

With the magnitude of this project a significant portion of the overall budget will be consumed by services, staffing and support functions contracted by GLWA. These include the following:

1. Engineering Design and Construction Oversight – (\$125,203,400)

The firm selected will be contracted via an Invitation to Bid process as a progressive design build project, by GLWA's Procurement Group. The Procurement Group manages activities involved in acquiring the goods and services needed for this project.

This design contractor will work with the wastewater engineering team to develop plans to integrate this project into the organization's water resource recovery facility in southeast Detroit. These services will include a basis of design, drawings, and technical specifications, to meet the technical requirements of the project, as well as coordinating with the organization's various stakeholders, including operations and maintenance team to ensure real-world reliability. The designer will ensure the designed-solution is technically feasible, practical, operations & maintenance friendly, and compliant with all laws and regulations.

During the construction phase of the project the design contractor will provide construction implementation services to ensure compliance with the approved design documents by providing quality assurance and quality control over all phases of work provided by the construction contractor.

2. Legal Services – (\$315,000)

Outside legal counsel will be engaged to draft and assist negotiating the design and construction contracts. Legal counsel will also assist with any specific issues that may arise during the course of the project.

3. Expenses for financing non-grant portion of the project – (\$1,537,000)

GLWA will pursue all opportunities for additional alternative funding in addition to the grant. In the event that debt financing is required, including State Revolving Fund loans, a contingency is budgeted to fully recognize the required costs.

4. Project controls consultant – (\$12,750,000)

Engaging a construction project controls firm is common for projects of this magnitude and consequence. This firm would provide the project controls tools and techniques to proactively control costs, schedules, and scope of work to reach the desired outcome. Providing, among other things, cost management and controls, schedule management and control, risk management and change order management.

5. Grant compliance review – (\$218,800)

Throughout the project GLWA will have engaged an outside firm to assist the internal grant compliance group in review and control of the grant administration.

6. Apprenticeship program – (\$2,750,000)

As part of this project an apprenticeship program will be implemented with the contractor awarded. This will focus on recruiting from disadvantaged communities, leveraging GLWA's current program with training provided and hands-on experience in the skilled trades. These skilled trades would include, but not limited to electricians, plumbers, millwrights, and carpenters. Due to the complexity and technical nature of this project skills related to controls systems as well as STEM oriented engineering, and analytical opportunities. This represents the direct cost of training, administration, and wages for this program.

7. Outside technical and construction-oriented contractors – (\$14,469,000)

To successfully complete this project additional support through a staffing agency will be required. These positions will supplement existing staff in managing the project. These positions will require some advanced skills and experience. Functioning as owners' representatives on the day-to-day activities this project will ensure proper oversight and compliance with the project design. Some positions listed, in **Table 3**, below may be engaged through the Project Controls Consultant.

Table 3 – Outside Technical and Construction contractor descriptions

Position	Relationship to the project
(1) Technical Manager	Subject matter expertise in support of Lifecycle Project Managers - Thermal hydrolysis process
(2) Inspector	Enforce compliance of site safety/security requirements and Compliance with design specifications
(3) Inspector	
(4) Inspector	
(5) Inspector	
(6) Resident Project Representative	On site representative coordinating work to be performed with contractors, liaison to Life Cycle project manager
(7) Resident Project Representative	Review and coordination of construction contract deliverables, liaison to Life Cycle project manager
(8) Resident Project Representative	Establish and review project cost and schedule controls, liaison to Life Cycle project manager

G: Construction (Federal Funds and Non-Matched Funds) – Total Estimated Cost (\$695,574,488)

Great Lakes Water Authority published its Wastewater Master Plan in June of 2020. The Master Plan was developed through three years of heavy collaboration with our member partners and the communities we serve to ensure alignment of alternative to the needs of the region. Through this effort several alternatives were presented in Sec 7.8.6.1 of the Wastewater Master Plan for management of biosolid at the Water Resource Recovery Facility. The selected alternative 3a. includes three stages, hydrolysis, anaerobic digestion, and gas treatment and reuse, that will convey the digested sludge into current drying treatment process, additionally, as an added benefit for the treatment process a Phosphorus recovery system is included to allow high concentration fertilizer while protecting the existing treatment processes from accumulation of vivianite. This alternative served as the basis for the proposed project.

1. Direct construction – (\$375,217,305)

Using the initial cost projections from the Wastewater Master Plan as the base for this project, the budget has been updated from 2020 for inflationary impact and coordination with manufacturers and constructors on both materials and labor to reflect current estimated costs. Additional effort has been made to adjust the budget as necessary for additional known conditions and revised estimates.

As a normal component of long-term construction projects an annual inflation factor of 3% has been added to the current estimate for a period of three years. This would update the projection to approximately the mid-point of the project.

This project will be managed as a Progressive Design-Build (PDB) which will allow for the Engineering Team to remain actively involved throughout the design development, fostering a collaborative relationship with the design-build team. This will also allow for greater budgetary control throughout the life of the project.

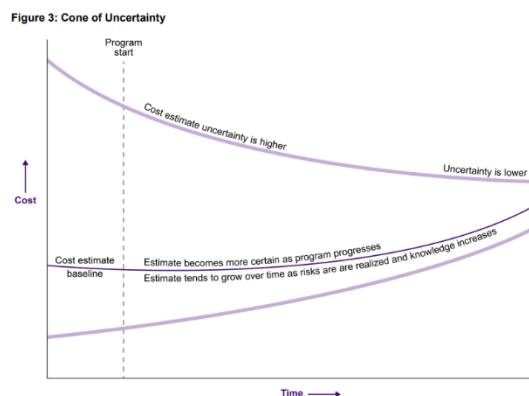
2. General Conditions Overhead and Profit (\$93,804,326)

General conditions, overhead, and profit are very common parameters that are included in the cost development for construction projects. The general conditions are designed to capture costs that are related to the overall success of the project. This could include managing the project site, project management staff, temporary utilities, and safety protocols. While overhead and profit is referred to as indirect costs associated with running the construction business based on the anticipated revenues expected by the design-builder for the project to ensure sustainability of the business for a successful project. Based on industry standards for cost estimate and GWA's experience a percentage of the overall construction project is common method to estimate the cost for general condition, overhead and profit. Upon receipt of bids from the contractor the general condition and overhead and profit will be separated and itemized.

3. Project Contingency (\$226,552,857)

The accuracy of a cost estimate improves as the design of a project advances from conceptual through detailed design. As the project definition matures and more information becomes available, the cost estimate will grow in complexity and detail. In addition, the contingency for risk and uncertainty will decrease as the level of project definition nears completion and the project becomes ready for bidding.

The Federal Government Accountability Officeⁱ has developed the Cone of Uncertainty, image on the right, to describe the general trajectories



of the baseline cost estimate and the associated uncertainties as a program or project evolves from concept through completion. GLWA leverage the industry standard through AACE International, Inc. (AACE)² that leverage classes of cost estimate based on expected accuracies. The expected accuracy is arrived from project definition. The AACE was formerly referred to as the Association for the Advancement of Cost Engineering International and was chartered in 1956 as the American Association of Cost Estimating Engineers. The AACE has developed 5 classes of cost estimates based principally on the level of project definition expressed as a percent of complete definition (i.e. 100% final design). The

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

five AACE cost estimate classesⁱⁱ are described in the table to the left. Each cost estimate class includes the typical project definition, end use, method of estimating, expected accuracy range, and approximate effort to prepare the estimate.

Based on the project definition for the ADF, a Class 4 estimated is used for the project estimate totaling for a range between 20% - 50% total construction cost. Based on the current definition of the project and its phase GLWA has utilized a 48% project contingency.

ⁱ "GAO Cost Estimating and Assessment Guide", March 2020 GAO-20-195G

ⁱⁱ "Cost estimate classification system – as applied in Engineering, procurement, and construction for the process industries", 2005 AACE

H: Other (Non-Federal Match) – Total Estimated Cost (\$998,000)

There will be ongoing activities supporting this project that will be incurred in the communities that the grantee services.

1. Regional Outreach to partner communities (\$500,000)

Communication with the various municipalities serviced will take place on a regular interval. These communities will not only benefit from the reduction in greenhouse gases, but will benefit as a region by controlling the cost structure for the services provided. A thorough understanding of the change and benefits will be part of the grantees' strategy. The grantee will host blue ribbon panels made of experts from the country that have experienced with similar project to ensure project understanding and benefits, allow for collaboration between experts to ensure a successful project with maximum benefit. Regular updates on the project will be conducted by the grantees outreach facilitator and internal staff throughout the project.

2. Community Outreach (\$250,000)

In addition to the communicating with the municipal leadership in the service area, continued outreach to various civic, religious, and cultural organizations will be part of the communication strategy. These groups represent the end users of the services provided. It is important to keep these communities leaders informed of changes that address affordability and service level. Senior staff have made, and will continue to make, themselves available to these groups.

3. Job Awareness and Recruiting within disadvantaged communities (\$248,000)

Similar to the community outreach, the Organization Development team will continue to make recruiting within disadvantaged communities a significant part of the outreach. As part of the apprenticeship program, ensuring these community members are aware of the opportunities for skilled labor training. In addition, other positions within the organization are highlighted at these events for those pursuing technical careers. A focused effort is planned, directly highlighting this project during years two through five. These efforts will involve activities such as conducting job fairs and presence at local community colleges.

J: Indirect Costs (Non-Federal Match)

GLWA does not anticipate any expenses within this category that would be related to this project.

Summary – The table below summarized the financial budget and associated funding for this project.

Category	Federal	Non-Federal	Total
A. Personnel	\$0	\$9,842,100	\$9,842,100
B. Fringe Benefits	\$0	\$3,463,000	\$3,463,000
C. Travel	\$0	\$0	\$0
D. Equipment	\$0	\$0	\$0
E. Supplies	\$0	\$0	\$0
F. Contractual	\$0	\$157,243,200	\$157,243,200
G. Construction - Detail attached	\$500,000,000	\$195,574,488	\$695,574,488
H. Other	\$0	\$998,000	\$998,000
<i>Total Direct Costs</i>	\$500,000,000	\$367,120,788	\$867,120,788
J. Indirect Costs	\$0	\$0	\$0
<i>Total Project Budget</i>	\$500,000,000	\$367,120,788	\$867,120,788