



Legislation Details (With Text)

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Title: Proposed Amendment No. 2
Contract No. GLWA-CS-103
Professional Engineering Services for Springwells Water Treatment Plant
Low and High Lift Pumping Station Improvements
CIP# 114002 / BCE Score: 69.2
Sponsors: Cheryl Porter, Grant Gartrell
Indexes: Water Operations
Code sections:
Attachments:

Date	Ver.	Action By	Action	Result
11/25/2020	1	Board of Directors	Approved	Pass
11/12/2020	1	Operations and Resources Committee	Recommended for Approval	Pass

Proposed Amendment No. 2
Contract No. GLWA-CS-103
Professional Engineering Services for Springwells Water Treatment Plant
Low and High Lift Pumping Station Improvements
CIP# 114002 / BCE Score: 69.2

Agenda of: November 25, 2020

Item No.: **2020-393**

Amount:	Original Contract	\$9,935,926.00
	Amendment No. 1	1,184,934.00
	Proposed Amendment No. 2	4,123,509.00
	Total Revised Contract	\$15,244,369.00

TO: The Honorable
Board of Directors
Great Lakes Water Authority

FROM: Sue F. McCormick
Chief Executive Officer
Great Lakes Water Authority

DATE: November 4, 2020

RE: Proposed Amendment No. 2
Contract No. GLWA-CS-103
Professional Engineering Services for Springwells Water Treatment Plant Low and High Lift Pumping Station Improvements
Vendor: CDM Smith

MOTION

Upon recommendation of Cheryl Porter, Chief Operating Officer - Water and Field Services, the Board of Directors (Board) of the Great Lakes Water Authority (GLWA), authorizes the Chief Executive Officer (CEO) to **enter into Contract No. GLWA-CS-103 Proposed Amendment No. 2 “Professional Engineering Services for Springwells Water Treatment Plant Low and High Lift Pumping Station Improvements” with CDM Smith, at an increased cost of \$4,123,509.00 for a total cost not to exceed \$15,244,369.00, and an increased duration of 60 months for a total contract duration of 132 months;** and authorizes the CEO to take such other action as may be necessary to accomplish the intent of this vote.

BACKGROUND

Contract CS-103 is a professional engineering services contract that includes study, design, bid, construction administration, resident project representation, start-up and O&M services related to major capital improvements at the Springwells Water Treatment Plant (SPP) under Capital Improvement Plan (CIP) No. 114002. The vendor providing these services is CDM Smith. The capital improvements include replacement of the existing; 1) low and high lift pumping units and associated major process mechanical valves and auxiliary systems, 2) medium voltage electrical system supplying power to the entire plant, and 3) Ovation control and power monitoring systems related to the low lift and high lift pumping stations. In addition to these improvements, architectural and building mechanical improvements are being made to the Pump House, Switch House, Turbine House, and Boiler House.

The original scope of Contract CS-103 included development and construction administration services associated with a single construction contract. Amendment No. 1 to the contract changed the single construction contract approach to three construction contracts to minimize the impact of construction on SPP operations and alleviate the safety concerns related to the aged medium voltage electrical switchgear. Additionally, Amendment No. 1 included the additional scope of replacing the three primary transformers on the three 24 kV Detroit Edison (DTE) feeders supplying power to SPP.

The three construction contracts resulting from Amendment No. 1 are defined in the current approved Capital Improvement Plan for CIP No. 114002 as follows:

Contract A - Low Lift Pump Suction Isolation Gate Replacement

Contract B - Medium Voltage Electrical Improvements

Contract C - Low and High Lift Pump Station Improvements

Since execution of Amendment No. 1, Contract A has been awarded (Contract No. 1900134) and construction is underway. Construction administration and resident project representation services for Contract A are being provided by in-house Water Engineering staff. The design for Contract B is nearly 90 percent complete and Contract C is nearing the end of its study phase.

Proposed changes covered by proposed Amendment No. 2 include the following:

- Change No. 1 - New 120 kV Substation

- Change No. 2 - New Utility Bridge
- Change No. 3 - Expanded Instrumentation and Controls Scope
- Change No. 4 - Provisional Allowance for Equipment Procurement Services
- Change No. 5 - Provisional Allowance for Off-Site Civil Site Improvements.

The background and description of each of these changes is provided below.

Change No. 1 - New 120 kV Substation

During development of the 50-percent complete design package for Contract B, coordination with DTE resulted in DTE determining that the existing 24 kV feeders (3 each) to SPP, due to age and condition, will not reliably meet the demand conditions proposed under the Contract CS-103 design. In order for GLWA to remain on the 24 kV power system, DTE noted that significant system improvements would need to be made to maintain system reliability, and further noted that GLWA would be responsible for paying for those improvements. As an alternative to the 24 kV system, DTE offered to bring 120 kV service feeders to SPP free of charge, as long as GLWA provided DTE access to a new 120 kV substation designed, owned and operated by GLWA. The 120 kV service offers a more robust and reliable system than the existing antiquated 24 kV system, and the 120 kV system can deliver power to SPP at a lower cost which will be reflected in reduced operating costs at SPP. A life-cycle cost analysis by the Contract CS-103 vendor demonstrated that converting to 120 kV system is fiscally advantageous for GLWA. Consequently, the recommendation is to move forward with the 120 kV substation, which will be designed under Contract CS-103 upon execution of this Amendment No. 2 and constructed under new CIP No. 114002 Contract D, New 120 kV Substation. The new substation will be partially located on existing SPP property and partially adjacent property currently owned by Conrail. Coordination with Conrail regarding acquisition of the property is currently underway.

Change No. 2 - New Utility Bridge

Since Contract CS-103 started on January 2, 2018, construction activities on Contracts CON-133 and CON-253 have demonstrated that system isolation in the SPP yard piping and transmission mains in the rights-of-way surrounding SPP is difficult, resulting in complications and delayed construction activities. In order to replace the pumping units under Contract C, 90-year-old isolation valves in the SPP yard piping and surrounding rights-of-way must function and adequately seat to allow replacement of the high lift pumping units. Experiences on Contracts CON-133 and CON-253 have demonstrated that these isolation valves cannot be relied upon to replace the high lift pumping units. Consequently, CIP No. 114010, Springwells Water Treatment Plant Yard Piping and High Lift Header Improvements, has started to advance yard piping improvements to facilitate isolation valve replacement such that high lift pumping units can be replaced under CIP No. 114002 Contract C.

Coordination between CIP No. 114002 and CIP No. 114010 has resulted in locating the new 120 kV substation described above such that the yard piping can be replaced without having to incur costs associated with protecting, reworking, or modifying new buried medium voltage cabling installed under CIP No. 114002 Contract B. This location and coordination have resulted in planned routing of new medium voltage cabling in a new utility bridge and demolition of all existing underground duct banks to avoid electrical system interruptions when the yard piping gets replaced. Upon execution of this Amendment No. 2, this utility bridge will be designed under Contract CS-103 and constructed under CIP No. 114002 Contract B.

Change No. 3 - Expanded Instrumentation and Controls (I&C) Scope

Since execution of Contract CS-103, GLWA governance documents related to system automation and cyber security at all GLWA water treatment plants have been developed and finalized under Contract CS-108. These governance documents are to be executed on all active and future improvements contracts at the water treatment plants. These governance documents have increased the level of effort for design and construction phase services on Contracts B, C

and D being developed by CDM Smith under Contract CS-103. Upon execution of this Amendment No. 2, these expanded I&C services will be incorporated into the designs of Contracts B, C and D. Costs associated with expanded I&C services related to Contract D are included in Change No. 1 to this Amendment No. 2.

Change No. 4 - Provisional Allowance for Equipment Procurement Services

Development of the CIP No. 114002 Contract C preliminary construction documents has determined that the lead time associated with the pumping equipment and major process valves is approximately 60 to 64 weeks per piece of equipment after approvals. Adding to these long lead times are necessary factory testing, installation and performance testing requirements recommended for this type of equipment, resulting in an 18- to 24-month period, following contract award, before GLWA sees beneficial use of a single pumping unit.

This long lead time, coupled with limitations of the world's pump and valve manufacturing industry for the currently proposed 21 pumping units, stands to prolong the installation of the needed pumping units. For these reasons, this Change No. 4 is creating an allowance to first investigate the benefit of procuring the pumping equipment and major process mechanical valves ahead of bidding the installation contract (Contract C). Upon execution of this Amendment No. 2, the Contract CS-103 vendor will investigate the aspects of procuring the major process equipment in terms of benefit to overall project schedule, benefit to the overall CIP financials, risk to GLWA, and complications to the installation under Contract C. It is estimated that procurement of the equipment by GLWA could reduce the total pump delivery time from 5 years to 4 years.

If procuring the equipment ahead of the construction contract proves beneficial, the Contract CS-103 vendor will prepare procurement documents for the major pumping equipment and process valves and coordinate those documents with the CIP No. 114002 Contract C.

Change No. 5 - Provisional Allowance for Off-Site Civil Site Improvements

Construction of improvements under CIP No. 114002 and CIP No. 114010 will require more construction staging area than is available on the existing SPP site. Additionally, design and construction of the 120 kV substation described in Change No. 1 above will require that a portion of the substation be located on the property adjacent to the east of the SPP property. The adjacent property is currently owned by Conrail. GLWA acquisition of the property will provide the needed construction staging area for proposed improvements under CIP No. 114002 and CIP No. 114010. Upon execution of this Amendment No. 2, this Change No. 5 will provide provisional funds to complete a site survey and prepare the property for CIP No. 114002 and CIP No. 114010 construction once the property becomes available upon final negotiations with Conrail.

A summary of Contract CS-103 costs associated with each of the changes described above is as follows:

- Change No. 1 - New 120kv Substation Work - \$1,910,902.00
- Change No. 2 - New Utility Bridge - \$675,197.00
- Change No. 3 - Expanded I&C Scope - \$787,410.00
- Change No. 4 - Provisional Allowance for Equipment Procurement Services - \$500,000.00
- Change No. 5 - Provisional Allowance for Off-Site Civil Site Improvements - \$250,000.00
- Amendment No. 2 Total - \$4,123,509.00

In addition to the additional budget requested under this Amendment No. 2, a contract extension of 5 years is requested to align the scope of services with the time required to procure and install the new

pumping equipment, major process valves, and for DTE to construct the 120 kV supply to SPP.

JUSTIFICATION

The base scope of engineering services for Contract CS-103 assumed that DTE feeders had adequate capacity and were reliable to meet the needs of the Springwells Water Treatment Plant (SPP). Additionally, it was assumed that the existing High Lift Station could be isolated from the transmission system surrounding SPP such that each of the high lift pumping units could be replaced. As the Contract CS-103 design progressed, neither of these assumptions proved to be true. Converting from the existing 24 kV feeders to the new 120 kV eliminates the need to make unanticipated upgrades to an obsolete and less reliable power supply while simultaneously upgrading the entire system to a more reliable power supply delivered to SPP at a reduced rate of approximately \$0.0058 per kWh from \$0.0198 per kWh.

Advancing CIP No. 114010, Springwells Water Treatment Plant Yard Piping and Discharge High Lift Header Improvements has provided the necessary coordination required to maintain SPP operability throughout construction of these major plant improvements. Locating the new 120 kV substation near the generators and installing the new cabling between the substation and new switchgear in the Boiler House in a utility bridge over the yard piping will ensure that the power supply to the plant is uninterrupted during replacement of the yard piping. This further reduces the construction costs associated with unknown locations of underground utilities on the yard piping replacement contract.

The expanded I&C scope is necessary to meet the future needs of automation at SPP and will maintain a secure network on which all GLWA water treatment plants currently operate. The changes in this Amendment No. 2 will ensure that the I&C improvements are designed, built, and installed to meet the future demands of the facility.

The pumping equipment and control valves to be furnished at SPP are unique in terms of size, quantity and the existing dimensional constraints under which they will be installed. Consequently, there are a limited number of manufacturers in the world that can provide the customized equipment, and those that can provide the equipment require long lead times (60 to 64 weeks per pumping unit after approvals). These long lead times will stretch the CIP No. 114002 Contract C construction schedule out, impact the project CIP spend, and potentially jeopardize SPP's ability to reliably meet system demands. Expeditious replacement is critical to facility operations due to the age and serviceability of the pumps and motors and limited availability of replacement components.

In addition to eliminating the potential for conflict during the yard piping replacement, locating the new 120 kV substation partially offsite will make access to the substation easy for DTE and provide needed construction staging area required to complete the critical improvements to SPP. The allowance for off-site improvements will allow the development of the adjacent property to the east when it becomes available from Conrail.

PROJECT MANAGEMENT STATUS

Original Contract Time	72 months
Amendment No. 1	0 months
Proposed Amendment No. 2	60 months
New Contract Time	132 months

PROJECT ESTIMATE

Original Contract Price	\$ 9,935,926.00
Amendment No. 1	1,184,934.00
Proposed Amendment No. 2	4,123,509.00
New Contract Total	\$15,244,369.00

FINANCIAL PLAN IMPACT

Summary: Sufficient funds are provided in the financial plan for this project.

Funding Source: Water Construction Bond

Cost Center: Water Engineering

Expense Type: Construction (5519-882111.000-617950-114002)

Estimated Cost by Year and Related Estimating Variance: See table below.

Original Contract Price	\$ 9,935,926.00
Amendment No. 1	<u>1,184,934.00</u>
Current Contract Total	11,120,860.00
Proposed Amendment No. 2	<u>4,123,509.00</u>
New Contract Total	15,244,369.00
Amended Financial Plan Estimate	<u>11,687,000.00</u>
Negative Estimating Variance	\$ (3,557,369.00)

A budget amendment will be prepared to fund the negative estimating variance from capital reserves associated with this Proposed Amendment No. 2.

COMMITTEE REVIEW

This item was presented to the Operations and Resources Committee at its meeting on November 12, 2020. The Operations and Resources Committee unanimously recommended that the GLWA Board adopt the resolution as presented.

SHARED SERVICES IMPACT

This item does not impact the shared services agreement between GLWA and DWSD.