Legislation Details (With Text)

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File created:	9/2/2020			**In control:**	Board of Directors
On agenda:	9/23/2020			**Final action:**	9/23/2020
Title:	Contract No. 1904337 WRRF PS-2 Bar Racks Replacements and Grit Collection System Improvements CIP# 211007 / BCE Score 65.2				
Sponsors:	Navid Mehram, Daniel Alford				
Indexes:	Wastewater Operations				
Code sections:					
Attachments:	1. CIP Plan 211007, 2. 1904337 Cost Tabulation - Notice of Respondents, 3. 1904337 Procurement Board Report				

Date	Ver.	Action By	Action	Result
9/23/2020	1	Board of Directors	Approved	Pass
9/9/2020	1	Operations and Resources Committee	Recommended for Approval	Pass

Contract No. 1904337
WRRF PS-2 Bar Racks Replacements and Grit Collection System Improvements
CIP# 211007 / BCE Score 65.2

Agenda of: September 23, 2020
Item No.: **2020-308**
Amount: $11,307,128.58

TO: The Honorable
Board of Directors
Great Lakes Water Authority

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

DATE: August 21, 2020

RE: **Contract No. 1904337**
WRRF PS-2 Bar Racks Replacements and Grit Collection System Improvements

Vendor: Hazen & Sawyer

MOTION

Upon recommendation of Navid Mehram, Chief Operating Officer - Wastewater Operating Services, the Board of Directors (Board) of the Great Lakes Water Authority (GLWA), authorizes the Chief Executive Officer (CEO) to **enter into Contract No. 1904337, "WRRF PS-2 Bar Racks Replacements and Grit Collection System Improvements" with Hazen & Sawyer, at a cost not to exceed $11,307,128.58 for a duration of 2,402 days;** and authorizes the CEO to take such other action as may be necessary to accomplish the intent of this vote.

BACKGROUND

GLWA operates two pump stations that lift the gravity sewer flow into the Water Resource Recovery Facility (WRRF) for treatment. Pump Station 1 receives flow from the Detroit River Interceptor and Oakwood-Northwest Interceptor (O-NWI). Pump Station 2 provides increased pumping capacity (beyond that of Pump Station 1) for O-NWI flows and provides priority treatment to the North Interceptor-East Arm (NI-EA) which receives primarily domestic sewage. The influent wastewater is lifted by the two pump stations and introduced to Preliminary Treatment processes: Screening and Grit Removal. Screening removes rags, plastics, floatables, and large solids while grit takes out heavy, abrasive, mostly inorganic particles out of the wastewater stream. The large solids, grit and rags, can interfere with treatment processes or cause undue mechanical wear and increased maintenance on downstream wastewater treatment equipment.

The WRRF Pump Station 2 preliminary process equipment includes 8 coarse bar racks with ¾-inch spacing and 8 aerated grit chambers. Flow from the raw sewage pumps enters the aerated bar screen influent channel through four (4) discharge channels. As the flow passes through the bar racks, the screenings are collected by a conveyor belt that discharge into a roll-off container for disposal at landfill. The screened flow is then distributed to the aerated grit chambers. Air supplied by multi-stage centrifugal blowers, bubbled through the wastewater as it passes through each chamber, produces a rolling action. As the wastewater rolls, grit falls out of suspension along the floor of the chamber. A manned crane with a clamshell bucket and suspended over the grit chambers is used to remove the collected grit for trucking to a landfill.

The existing bar rack and grit system has been in use beyond what would be considered its normal useful asset life and as a result its effectiveness in removing solids, grit and rags from the wastewater stream is diminished. This is observed from the number of pumps throughout the facility that experience binding from rags and premature wear of equipment. Another operational indicator of poor grit capture rate is the decline in the organic concentration of the primary sludge. The change in concentration is a direct correlation of inorganic material bypassing the grit system and settling in the primary sludge process.

JUSTIFICATION

The Pump Station 2 bar rack and grit system was originally constructed in the late 1990's with minimum updates constructed since then. The existing system has exceeded its useful life and needs replacement. The system is labor intensive and does not provide adequate capture of solids to protect downstream equipment that introduce operational and maintenance challenges.

The existing ¾-inch coarse bar racks are ineffective in capturing the solids more commonly found in wastewater today. An example of this is flushable wipes that cause binding of pumps, grinders, valves, etc. that results in increased maintenance costs on all downstream equipment at the WRRF.

Additionally, the existing aerated grit system is very labor intensive and requires a manual clam shell operation for cleaning and removal of the accumulated grit. The existing grit removal process is not continuous and very time consuming. The grit can accumulate in the grit chamber up to 4-5 ft high before removal via the clam shell bucket. The high accumulation levels obstruct the rolling patter of the aerated grit causing carry over of grit to downstream processes. With the slow removal process, operations are commonly unable to remove all accumulated grit prior to the next rainfall event. With already high levels of grit in the chambers the majority of the influent grit bypasses the chambers and settles in the primary clarifiers. This can cause damage to clarifier equipment and premature wear on sludge conveyance system. Any future grit removal system will run on a continuous basis and have the capability to remove a greater percentage of wastewater grit. Additionally, the existing three aeration blowers, diffusers, and distribution piping all require replacement due to age and wear. Replacement blower systems will be more energy efficient than the existing 25-year

old equipment.

The new project will improve screening capture rates (with fine and course screens) and improved grit removal with continuous operations with proven technologies. As part of the two-process modification Hazen & Sawyer proposes to include a facility adjacent to the existing to provide a wet weather train and to increase operation flexibility.

FINANCIAL PLAN IMPACT

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

Funding Source: Construction Bond Fund

Cost Center: Sewer

Expense Type: Design (5421-892211.000-617950-211007)

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

Fiscal Year	
FY 2020 Budget	170,000.00
FY 2021 Budget	3,012,000.00
FY 2022 Budget	7,460,000.00
FY 2023 Budget	1,463,000.00
FY 2024 Budget	1,202,000.00
FY 2025 Budget	1,199,000.00
FY 2026+ Budget	995,000.00

Financial Plan Estimate	15,501,000.00
Proposed Contract Award	11,307,128.58
Positive Estimate Variance	$4,193,871.42

SAVINGS, COST OPTIMIZATION, AND REVENUE ENHANCEMENT IMPACT

This project provides for the design on WRRF PS-2 Bar Racks Replacement and Grit Collection System Improvements. The cost savings are not determinable at the time of award.

COMMITTEE REVIEW

This item was presented to the Operations and Resources Committee at its meeting on September 9, 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.