



DATE: June 23, 2020

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Adopt a Resolution Approving Addendum No.1 and Addendum No.2 and Awarding a Contract to GSE Construction Company, Inc., for the Water Pollution Control Facility (WPCF) Headworks Bar Screens Project, Project No. 07567, in an Amount Not-to-Exceed \$7,886,200, and Appropriating Additional Funds from the Sewer Replacement Fund in the Amount of \$4,598,300

RECOMMENDATION

That Council adopts the attached resolutions (Attachments II and III) approving Addendum No. 1 and Addendum No. 2 and awarding a contract to GSE Construction Company, Inc., for the WPCF Headworks Bar Screens Project, Project No. 07567, in an amount not-to-exceed \$7,886,200; and appropriating additional funds to the project from the Sewer Replacement Fund in the amount of \$4,598,300.

SUMMARY

The Water Pollution Control Facility (WPCF) collects and treats wastewater from the City's residents and businesses. The WPCF headworks facility is the first treatment process in the plant and is responsible for removing large debris that can harm downstream pumps and other equipment. Currently, the headworks relies on grinders to protect downstream equipment. This project includes installing new bar screens to replace the grinders. Bar screens are much more effective at removing increasingly popular disposable wipes and are typically employed throughout the industry in headworks designs. This project also includes: screenings conveyance; screenings washer compactor to consolidate the screenings for disposal; ventilation system improvements; lighting improvements; a new ferric chloride storage and feed facility; and odor control facilities.

On April 28, 2020, Council approved the plans and specifications for the project and called for bids to be received on June 2, 2020. Five (5) bids were received, ranging from \$7,169,200 to \$8,323,000. Two (2) of the bids were below the Engineer's estimate of \$7,344,000, while three (3) bids exceeded the Engineer's estimate. The low bid was \$7,169,200, which is \$174,800 or approximately 2.4% below the Engineer's estimate. Staff

is requesting Council's approval of Addendum No. 1 and Addendum No. 2, which incorporated COVID-19 safety requirements during construction and provided minor revisions to the bid documents, and awarding the contract to the lowest bidder, GSE Construction Company, Inc., in the amount not-to-exceed \$7,886,200, including Administrative Change Orders.

Staff is further requesting an additional appropriation of \$4,598,300 to complete this project. As explained later in this report, the scope of the proposed project has increased to include additional needed elements and cost efficiencies. The project is subject to the Community Workforce Agreement.

BACKGROUND

The WPCF treats an annual average flow of twelve million gallons per day (MGD) prior to discharge into the deep waters of the San Francisco Bay. All flow coming to the WPCF passes through the Headworks facility where it is conveyed through influent channels that contain grinders designed to break down large debris prior to pumping. The headworks facility was constructed in 1996 and is essential to plant operations. In 2016, a project was completed that rehabilitated interior concrete surfaces that had deteriorated from corrosion.

In 2018, Council authorized a professional services agreement with Black and Veatch to perform the WPCF Phase II Facilities Plan that is to serve as a comprehensive planning document to identify WPCF infrastructure needs for the next twenty-five years. A headworks evaluation was performed as part of the planning effort. The evaluation recommended replacing the existing grinders with new bar screens to address operational issues at the WPCF.

The project includes the following components:

Bar Screens: The recommendation from the Phase II Facilities Plan is to replace the plant's existing grinders with new bar screens and related equipment (screenings conveyance, and screenings washer/compactor). The grinders are designed to protect influent pumps from large debris; however, they do little to prevent rags and other stringy material from passing through to downstream processes. This problem has been further exacerbated by the proliferation of "disposable" wipes that are flushed down toilets and end up at the WPCF. These wipes cause significant problems because they do not break down in the collection system like toilet paper, creating solids that build up in tanks and piping systems. The impact of disposable wipes to the wastewater industry is well documented and is reflected in the significant mechanical hardships and maintenance time at the WPCF in downstream processes. In addition, rags and disposable wipes end up in the plant's digesters, reducing the space available for organic matter that produces beneficial bio-gas, as well as causing the units to be taken out of service more frequently for cleaning. Bar screens are more efficient at removing rags and wipes from the flow stream and are employed at many water pollution control facilities.

Screenings Conveyance and Screenings Washer Compactor: The design includes a conveyor and a screenings washer compactor located on the upper level of the Headworks. The bar screens capture rags and other debris from the influent flow stream and lift the debris with rake arms to the upper level where the screenings are then discharged onto a conveyor. The conveyor sends the screenings to a washer compactor where the solids are compressed, washed of organics, and discharged to a bin for hauling and disposal. The screenings are washed to reduce the organic component of the material that causes odor prior to disposal.

Motorized Inlet and Outlet Gates for Bar Screen Channels: The headworks facility has three influent channels: two that will be equipped with bar screens and one with a manual bar rack that will be employed during extreme wet weather events or in the event of a bar screen being out of service for maintenance. Water level is monitored in the influent channels that control the number of screens in service. In the event of high level, the manual bar rack channel is placed into service to prevent wastewater from inundating the lower level of the Headworks. Currently, the gates are manually operated and due to their size, opening and closing the gates requires significant effort and time. Electrically operated gates will greatly simplify the operations of the facility by allowing channels to be placed into service automatically based on water level in the channels. During wet weather flows, when flows increase to the plant, rising water levels will trigger the influent gates to open automatically without Operator intervention, allowing Operators to attend to more pressing matters that frequently occur during wet weather.

Ferric Chloride Facility: The WPCF has a ferric chloride storage and feed facility located just south of the existing Headworks Building. The chemical is currently used for odor control in the Headworks by reducing the concentration of hydrogen sulfide gas, which is toxic to personnel and causes odors. An added benefit of hydrogen sulfide control is the reduction in sulfides in the digester gas, resulting in longer media life in the iron sponge treatment vessels that treat the gas prior to use in the cogeneration engine. The existing ferric chloride facility is old, and in need of upgrading. Access to the facility is difficult for chemical deliveries, and the facility is not fully contained against accidental spills from leaking pipes and appurtenances. The design covered under this agreement includes replacing the facility with a fully code compliant facility for storage of hazardous chemicals.

Ventilation System and Odor Control Improvements: The 2016 Headworks Rehabilitation Project upgraded the ventilation system in the lower level of the Headworks to draw foul air from the channels and to supply air directly to the lower level where most of the odors are generated. With the addition of bar screens and screenings handling/washing equipment, improvements are required to improve the air flow in the upper and lower levels and increase exhaust air from the influent box to reduce odors inside the headworks. In addition, the existing biofilter, which was installed in the original project in 1996 to reduce odors, has wood chip media that has degraded and is no longer functioning effectively. This type of odor control technology has a limited lifespan, typically ten to fifteen years. This project includes a new biofilter to replace the existing biofilter.

Bypass Pumping: Because the project will include extensive modifications to the influent channels to install new motorized gates and bar screens, the preference is to perform the

channel modifications and installation of the screens during dry weather when the flow through the Headworks can be bypassed. This project includes bypass pumping of all the influent flows around the Headworks during the dry season in summer of 2021. Removing the Headworks from service reduces the construction duration that would otherwise require constructing improvements one channel at a time, and associated risks in constructing improvements both while the facility is in operation, and during wet weather when influent flows can be unpredictable.

In April 2019, Council authorized a professional services agreement with Carollo Engineers to perform final design services for the Headworks Bar Screens Project. The scope of work included preliminary and final design services of the bar screens and other related improvements. On April 28, 2020, Council approved the plans and specifications for the WPCF Headworks Bar Screens Project and called for bids to be received on June 2, 2020.

DISCUSSION

On June 2, 2020, the City received five (5) bids for the project, ranging from \$7,169,200 to \$8,323,000. GSE Construction Company, Inc., out of Livermore, CA, submitted the low bid in the amount of \$7,169,200, which is approximately 2.4% below the Engineer's estimate of \$7,344,000. An additional \$717,000 (or approximately 10% of the contract amount) is included for administrative change orders in the event additional funds are needed for unforeseen conditions and changes during construction. Given the complexity and unforeseen nature of underground improvements, extensive modifications and replacement of outdated infrastructure, and exposure to hazardous materials and toxins, the administrative change order budget will also cover contingencies to address uncertain field conditions. Therefore, the contract limit requested is \$7,886,200, including administrative change orders.

ECONOMIC IMPACT

Replacing the grinders with bar screens is part of an effort to modernize and upgrade existing WPCF facilities. The project will reduce operations and maintenance costs associated with repairing grinders and cleaning digesters. In addition, unplanned outages and staff time attending to issues related to accumulations of rags and wipes in the piping and pumping systems will be reduced. The community will benefit from the Project, through effective wastewater treatment that provides environmental protection of the San Francisco Bay. In addition, the construction project will create some local economic activities, including the hiring of Hayward local residents as required in the Community Workforce Agreement.

FISCAL IMPACT

The total cost for the Headworks Bar Screens Project is estimated at \$9,237,300, as shown in the table below:

Total Project Cost

Design and Engineering Services During Construction (Consultant)	\$1,071,100
--	-------------

Construction Administration	\$150,000
Construction Contract	\$7,169,200
Administrative Change Orders	\$717,000
Inspection and Testing	<u>\$130,000</u>
Total	\$9,237,300

The Ten-Year Capital Improvement Program (CIP) includes partial funding of the project total from four projects, as shown in the table below:

Fund	Project No.	Description	Budget
612	07567	WPCF Headworks Bar Screens	\$ 4,030,000
611	07677	WPCF Biobeds Media Replacement	\$354,000
611	07619	WPCF Motorized Valve Actuators for Influent Gates	\$105,000
612	07714	WPCF Headworks Channel Actuators	\$150,000
		Total	\$4,639,000

The WPCF has needed better screenings capture for many years and the 2014 Master Plan Update recommended sludge screening as a way of capturing rags and other debris in the treatment process. The location of the sludge screening downstream of the primary clarifiers only protects the treatment plant equipment downstream of where the screens are installed. The location recommended in the 2014 Master Plan Update does not protect key treatment plant components including the influent pumps, the vacuator process where grit and scum are removed, and the primary clarifiers sludge pumps. The Phase II Facilities Plan update recommended locating the screens upstream of the headworks influent pumps; a location that is typical of virtually every modern treatment plant constructed today. The original location of the screens chosen in the 2014 Master Plan Update resulted in a smaller screenings facility due to the lower flow rates that would need screening, but only partially protected the treatment plant. The new location screens the entire flow influent to the plant, is a larger facility, and protects all the treatment plant components downstream of where the flow enters the plant. Therefore, this project has resulted in a larger capital cost than the ones originally contemplated in the City's CIP.

Furthermore, during the design phase for this project, it was determined that the headworks facility would benefit from structural modifications that were not included in the planning level estimates, as well as additional equipment such as screenings washer compactor and conveyor and new automatic gates. Structural modifications were required to provide alternative access to the Headworks lower level by addition of stairs on the exterior of the building to access the lower level. This necessitated moving the ferric chloride facility, which was in the way of the stairs. Staff also determined that the existing facility was not in compliance with current code requirements for the storage of hazardous materials and a new facility is required to provide for increased Operator safety and compliance with fire code requirements for the storage of hazardous materials. These additions to the project scope increase the cost of the project but are less costly than installing these items as separate projects. Staff discussed appropriating additional funds during the April 20, 2020 City Council meeting when requesting approval of the project

plans and specifications and call for bids. Another unknown for projects of this size and complexity is the additional cost for compliance with the Community Workforce Agreement, which adds additional overhead costs that Contractors must account for when required to hire workers outside their core employees. Therefore, staff is requesting that an additional \$4,598,300 be appropriated from the Capital Improvement Program – Sewer Replacement Fund (611) to cover the increased project cost. Sufficient funds are available in the fund balance. There will be no impact to the General Fund.

STRATEGIC ROADMAP

This agenda supports the Strategic Priority of Improve Infrastructure.

SUSTAINABILITY FEATURES

This project will help the City maintain its ability to treat wastewater efficiently and adequately before discharging into San Francisco Bay.

PUBLIC CONTACT

All project work will be within the WPCF plant boundary and should have no impact on area businesses or the public at large; therefore, no public contact is necessary for this project.

NEXT STEPS

The following schedule has been developed for this project:

Award of Construction Contract	June 23, 2020
Notice to Proceed	July 20, 2020
Construction Completion	December 2021

While this a “shovel ready” project and can potentially benefit from any federal or state stimulate funding, it is important for the project to remain on schedule so that the work can be substantially completed during the dry season.

Prepared by: Mariza Sibal, Assistant Civil Engineer
Suzan England, Senior Utilities Engineer

Recommended by: Alex Ameri, Director of Public Works

Approved by:



Kelly McAdoo, City Manager