



DATE: April 28, 2020

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Adopt a Resolution Approving Plans and Specifications and Call for Bids for the Water Pollution Control Facility (WPCF) Headworks Bar Screens Project, Project No. 07567

RECOMMENDATION

That Council adopts a resolution (Attachment II) approving the plans and specifications for the WPCF Headworks Bar Screens Project and call for bids to be received on June 2, 2020.

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. In recent years with the increasing popularity of "disposable" wipes, downstream processes have been impacted by the inability of the grinders to remove these wipes that cause pumps and pipes to clog. In addition, wipes collect in the digesters reducing their capacity, which causes them to be removed from service more frequently for cleaning. This project includes installing new bar screens to replace the grinders. Bar screens are much more effective at removing 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

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 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 that will serve the 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.

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.

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 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, which can produce beneficial bio-gas and 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 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 which 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 which 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 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 bottom 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. The 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 the 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. The 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.

ECONOMIC IMPACT

Replacing the grinders with bar screens is part of an effort to modernize and upgrade existing 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 enjoy the benefits of the project, including maintaining effective

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 FY 2019 through FY 2028 Capital Improvement Program (CIP) includes funding for the projects described in the Sewer Replacement Fund (Fund 611). The projects are described in the approved CIP as follows:

Fund	Project No.	Description	Budget
612	07567	WPCF Sludge Screening	\$ 4,030,000
611	07677	WPCF Biobeds Media Replacement	\$224,000
611	07619	WPCF Motorized Valve Actuators for Influent Gates	\$105,000
		Total	\$4,359,000

The breakdown for project costs is as follows:

Total Project Cost

Design and Engineering Services During Construction (Consultant)	\$ 1,071,028
Design Administration – City Staff	100,000
Construction Contract (Estimated)	6,830,000
Administrative Change Orders (Estimated)	550,000
Inspection and Testing (Estimated)	100,000
Total	<u>\$8,651,028</u>

The construction cost is an estimate. Should the construction cost exceed the funds currently allocated in the CIP, staff will request that additional funds be appropriated to cover the additional cost. Given that the project is scheduled to be awarded in June, ahead of FY 2021, staff will request that funds be appropriated from the fund balance at the time of the request, to award the construction project.

STRATEGIC ROADMAP

This agenda item does not relate to one of the Council’s Strategic Roadmap Initiatives.

SUSTAINABILITY FEATURES

This agenda item does not incorporate any sustainability features.

PUBLIC CONTACT

All project work will be within the WPCF boundary; therefore, no public contact is necessary for this project.

NEXT STEPS

The following schedule has been developed for this project:

Open Bids	June 2, 2020
Award of Construction Contract	June 23, 2020
Issue Notice to Proceed	July 20, 2020
Construction Completion	December 2021

The plans and specifications are ready now for call for bids. The estimated construction cost for the project is over \$1 million and therefore the construction contract will be subject to the Community Workforce Agreement. If the Covid-19 economic stimulus funds are available by the time the project is awarded, it would be an excellent candidate to apply for such funding.

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Recommended by: Alex Ameri, Director of Public Works

Approved by:



Kelly McAdoo, City Manager