



DATE: July 5, 2022

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Adopt a Resolution Approving the Plans and Specifications and Calling for Bids for the Water Pollution Control Facility's (WPCF) Switchgear Rehabilitation Project, Project No. 07656

RECOMMENDATION

That Council adopts the attached resolution (Attachment II) approving the plans and specifications for the Water Pollution Control Facility's (WPCF) Switchgear Rehabilitation Project, Project No. 07656, and calling for construction bids to be received on August 16, 2022.

SUMMARY

The WPCF treats an annual average flow of approximately eleven million gallons per day (MGD) and meets current requirements to discharge treated effluent to the deep waters of the San Francisco Bay. The existing main switchgear (MSB), originally installed in 1982, is a key component of the power distribution system at the WPCF. The MSB, along with several related motor control centers (MCCs), have provided power and controls to various plant processes for nearly forty years. Concern over continued reliability of the switchgear due to obsolescence and availability of parts, as well as the current condition and continued deterioration from corrosive atmospheres, prompted staff to request that the electrical system be evaluated as part of the Water Pollution Control Facility (WPCF) Phase II Facilities Plan. The Phase II Facilities Plan serves as a comprehensive planning document for the WPCF infrastructure needs for the next twenty-five years. An evaluation of the Old Cogeneration Building Electrical System was performed as part of the planning effort. The evaluation recommended replacing the existing MSB as well as consolidating and replacing several existing aged MCCs, and retrofitting the existing old Cogen Building to house the new electrical equipment.

This project is categorically exempt from environmental review under Section 15301(c) of the California Environmental Quality Act (CEQA) Guidelines for the operation, repair, maintenance, or minor alteration of existing facilities.

BACKGROUND

The WPCF collects and treats wastewater from the City's residents and businesses. The original WPCF 480-volt MSB was designed to power the entire WPCF at the time of its construction and was connected directly to two cogeneration engines that satisfied part of the plant demand, and a standby generator as a backup to PG&E. In 2008, the Phase 1 WPCF upgrade project was completed that included a new electrical service entrance from PG&E, a new 12-kV switchgear building, a 12-kV power grid, several 12-kV substations to distribute power around the plant, and a new standby diesel generator. The electrical system upgrades were largely constructed to serve new loads added as part of the Phase 1 project and other than sub-feeding the power from the new 12-kV switchgear to the MSB, did not include improvements to the plant's existing 480-volt power distribution system. In 2014, a new 1,132 kW cogeneration engine was commissioned as part of the Cogeneration Upgrade Project, and the old cogeneration engines that previously supplied power to the plant through the MSB were decommissioned. The MSB continues to supply power to many vital loads throughout the plant including the headworks, north and south vacuators, the primary treatment process, the west trickling filter, the anaerobic digesters, the site wastes pump station, and various buildings and site lighting.

On February 27, 2018¹, Council authorized a professional services agreement with Black and Veatch to perform the WPCF Phase II Facilities Plan that serves as a comprehensive planning document for the WPCF infrastructure needs for the next twenty-five years. A MSB evaluation was performed as part of the planning effort, which recommended replacing the existing MSB and related electrical equipment.

On May 18, 2021², Council authorized a professional services agreement with Carollo Engineers to perform final design services for the WPCF Switchgear Rehabilitation Project. The scope of work included preliminary and final design services of the switchgear and other related improvements.

DISCUSSION

PROJECT SCOPE

The recommendations from the Phase II Facilities Plan are to replace the plant's existing MSB, several MCCs and distribution panelboards, and related equipment. The existing electrical equipment, installed in 1982, have exceeded their useful lives. In addition, staff have difficulty procuring replacement parts, as the parts are no longer produced for equipment this old. The existing MSB is at risk of failure due to long-term exposure to hydrogen sulfide and the resulting corrosion of its copper bussing. Replacement is needed for continued operational reliability of the WPCF and many of its essential processes.

The project includes the following components:

- MSB: The MSB was installed in 1982, and at forty years in service, has exceeded its useful life. Staff have difficulty procuring replacement parts since they are obsolete and no longer being produced. In 2006, an assessment of the existing MSB equipment was

¹ <https://hayward.legistar.com/LegislationDetail.aspx?ID=3354003&GUID=015931F3-41B1-45E5-8345-F8440FF11A26&Options=&Search=>

² <https://hayward.legistar.com/LegislationDetail.aspx?ID=4955268&GUID=821E06AC-AAAD-450F-8B45-0A98D661D498&Options=&Search=>

performed by Terada Engineering, Inc., which recommended replacement of switchgear components due to component obsolescence. This assessment also noted that the switchgear was housed within a room that was subjected to significant levels of hydrogen sulfide due to its proximity to the East Barminutor Structure where two of the City's main sewer lines converge. In 2020, as part of the WPCF Phase II Facilities Plan, an evaluation was completed that confirmed the previous findings that recommended replacing the MSB.

- **Motor Control Centers (MCCs):** Several of the existing motor control centers (MCCs) powered by the MSB were evaluated and recommended for replacement due to their age and obsolescence. These MCCs were installed at the same time as the MSB (1982) and are also at the end of their useful life. These include: the obsolete MCC-5B which primarily includes breakers and starters associated with the old, decommissioned cogeneration equipment; MCC-5A, which supplies equipment located in the boiler room; and several obsolete pump control panels serving the flow equalization return pumps. In addition, a nearby outdoor MCC (MCC-19) is in extremely poor condition due to proximity to the primary clarifiers (a corrosive environment) and is slated for demolition. MCC-19 contains several starters for the West Trickling Filter ventilation system that are still in service, as well as obsolete equipment that is no longer in service. These existing breakers and starters from MCC-5A, 5b, and 19 will be housed in a new MCC panel located adjacent to the new MSB. In addition, the existing supervisory control and data acquisition (SCADA) / remote telemetry unit (RTU) cabinet located inside the electrical switchgear room will be replaced with a new programmable logic controller (PLC) cabinet to serve equipment housed in both the MSB and new MCC.

The Site Waste Pump Station (SWPS) currently houses MCC-2A and 2B which were also installed in 1982 and have reached the end of its useful life. A new replacement MCC and PLC panel is included. MCC-2A and 2B provide power and control to many essential plant process areas including primary treatment, site waste pumping, and anerobic digestion. Replacement is needed for continued reliability of the WPCF operations.

- **Old Cogeneration Building Improvements:** In addition to replacing the MSB and MCCs, the Phase II Facilities Plan recommended retrofitting the existing Old Cogeneration Building to provide the required architectural and environmental improvements needed to house the new electrical equipment. The improvements include: removing unused equipment formerly associated with the cogeneration system from the roof of the building; sealing openings in the roof and floor associated with the engines and associated piping; installing new roofing; replacing existing louvers with aluminum infill panels; adding interior and exterior finishes; and replacing the heating, ventilation, and air conditioning (HVAC) equipment. In addition, an exterior stairwell will be installed to provide safe roof access for maintaining the new HVAC equipment. These improvements will seal the building from adjacent corrosive environments and will result in an interior environment that is suitable for housing this type of critical electrical infrastructure.

- Site Waste Pump Station Operation Control House: In addition to replacing MCC-2A and 2B and the control panels from the Operation Control House, the project will also update the operation's office and laboratory with new HVAC equipment, flooring, and restroom renovations.
- Transformer: As noted above, the building is currently designed in an open louvered and ventilated structure which has resulted in extensive corrosion of the copper components within the electrical enclosure, and corrosion to an elevated copper bus duct and surrounding structure associated with transformer located outside the building. A new transformer is included to replace the existing corroded unit as well as new cable trays that will replace the existing elevated bus duct. In addition, the grating that currently covers the existing East Barminutor Structure will be replaced with a solid cover and is expected to result in a less corrosive atmosphere surrounding the new transformer.
- Panelboard Replacement: The project includes removing obsolete and unreliable control panels and equipment and installing new 480V panelboards at the South Vacuator, Air Compressor Building, and Maintenance Building. These improvements will provide safe and reliable power sources to the WPCF as well as clean up and remove outdated electrical systems.
- Programmable Logic Controller (PLC) Installation: The existing remote monitoring units (RMU), RMU-1 inside the Operations Control House, and RMU-8, inside the electrical switchgear room, will be replaced with new PLC cabinets because of their obsolescence and significant amount of field wiring in poor condition. The new PLC cabinets and all connected equipment require updated SCADA programming, which will be performed by a third-party programmer.

Notice to proceed will be issued following bid opening in August 2022. Equipment procurement for the MSB, MCCs, and transformer are expected to take approximately one year. Construction is anticipated to begin in Summer 2023 and is estimated to take approximately 22 months to complete. The prolonged schedule is due to industry-wide material shortages, procurement challenges, and global supply chain issues.

ECONOMIC IMPACT

Replacing the MSB, MCCs, and related electrical equipment are part of an effort to modernize and upgrade existing facilities. The project will greatly improve reliability by reducing staff time associated with breakers tripping causing unplanned outages and staff time attending to issues otherwise related to component failures. The community will enjoy the benefits of the Project, including maintaining effective treatment that provides environmental protection of the San Francisco Bay.

FISCAL IMPACT

The FY 2023 through FY 2032 Capital Improvement Project (CIP) includes funding for Project 07656 WPCF Main 480V MCC Electrical Distribution Rehabilitation described in the Sewer Replacement Fund (Fund 611). Table 1 shows the project as described in the approved CIP.

Table 1. Sewer Improvements Funding

Fund	Project No.	Description	Budget
611	07656	WPCF Main 480V MCC Electrical Distribution Rehabilitation	\$10,989,000

The breakdown for project costs is as follows:

<u>Total Project Cost</u>	
Engineering Services (Consultant)	\$1,108,835
Design and Construction Management – City Staff (Estimated)	\$105,000
Construction Contract (Estimated)	\$10,510,000
Construction Contingency (10% of Construction Contract)	\$1,051,000
Inspection and Testing (Estimated)	\$105,000
Total	\$12,879,835

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.

On November 15, 2016^[1], Council passed a resolution authorizing a Community Workforce Agreement (CWA) with the Alameda County Building Trades Council (BTC), which applies to City projects with construction costs of \$1,000,000 or more. The agreement requires contractors to use local union hiring halls, encourages contractors to employ Hayward residents or Hayward Unified School District graduates, and requires hired workers to pay union dues and other benefit trust fund contributions, etc. Because the construction cost estimate for WPCF Switchgear Rehabilitation Project is anticipated to be more than \$1,000,000, the CWA agreement applies to this project.

STRATEGIC ROADMAP

This agenda item supports the Strategic Roadmap to Invest in Infrastructure. Specifically, this item supports the following:

Project N19: Design Water Pollution Control Facility Phase II Upgrade

SUSTAINABILITY FEATURES

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

PUBLIC CONTACT

^[1] <https://hayward.legistar.com/LegislationDetail.aspx?ID=2882111&GUID=118B2EF9-1D2C-471F-999E-4BE0929706A0&Options=&Search=>

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

If Council approves the project, staff will advertise the construction project for public bidding and turn to Council for the award of the construction contract after construction bids have been received and reviewed.

The following schedule has been developed for this project:

Receive Bids	August 16, 2022
Award Construction Contract	September 20, 2022
Notice to Proceed	October 14, 2022
Construction Completion	May 2025

Due to anticipated delays in equipment procurement and global supply chain issues, the project is anticipated to be completed in May 2025, which is a longer timeline than in normal years. Staff aims to issue the notice to proceed in October 2022 to begin the material procurement phase and accommodate for the long lead times to manufacture the electrical equipment. It is anticipated that construction will begin in Summer 2023 upon material procurement. Scheduling changes may occur as a result of supply chain volatility and material availability. In addition, staff will advertise a request for proposals for a professional services agreement for third party programming services for SCADA /PLC programming and systems integration required for the new electrical equipment. Staff will turn to Council for the award of the professional services prior to the procurement of the electrical equipment.

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Approved by:



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