



City of Arts & Innovation

City Council Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL DATE: OCTOBER 24, 2017

FROM: PUBLIC WORKS DEPARTMENT WARDS: ALL

**SUBJECT: REGIONAL WATER QUALITY CONTROL PLANT PHASE 1 REHABILITATION
AND EXPANSION PROJECT CONSTRUCTION COMPLETION, BID 6983**

ISSUES:

Receive a construction completion report on the Regional Water Quality Control Plant (RWQCP) Phase 1 Rehabilitation and Expansion Project.

RECOMMENDATIONS:

That City Council:

1. Receive and file the construction completion report on the RWQCP Phase 1 Rehabilitation and Expansion Project (BID 6983); and
2. Authorize a project open house event in early November, 2017.

BACKGROUND:

The Regional Water Quality Control Plant Phase 1 Rehabilitation and Expansion Project (Project) rehabilitated and/or replaced aged treatment facilities, installed new equipment and modified or improved processes to comply with regulatory requirements and increase treatment capacity from 40 to 46 million gallons per day. The Project ensures safe and reliable treatment of the wastewater received from the City, the community of Highgrove, as well as from the Edgemont, Rubidoux and Jurupa Community Services Districts.

The Project modernizes the facility and technology which will result in improved treatment plant performance and customer service. To date the project represents the largest Public Works Project undertaken with an infrastructure investment value of \$192.2 million dollars. The Project construction was complete as of June 30, 2017.

On January 10, 2012, the City Council adopted Resolution No. 22325 making the findings that the Project is substantially complex in nature to allow for the withholding of 10% retention from the construction contract. This action was taken to address section 7201 of the California Public Contract Code which limits the retention proceeds the City can withhold under a public works contract to 5% percent unless the City makes findings that the project is substantially complex and requires a higher retention amount.

On June 19, 2012, the City Council awarded the Project construction contract to PCL Construction, Inc. (BID 6983) in the amount of \$192,202,921 and authorized 6.5% or approximately \$12,493,190 in change order authority. On September 10, 2012, a Notice to Proceed was issued to PCL Construction, Inc. The project was scheduled to last 811 working days to December 9, 2015.

On April 7, 2015, the Public Works Department provided to the City Council its fifth Project update. As of February 10, 2015, a total of 59 extra work items had been issued totaling \$2,662,145 or 1.3% of the authorized change order contract amount. It was reported that the excavation of a large seam of hard granite boulders (totaling 6,000 tons) running through the flow equalization basin and membrane bioreactor (MBR) clarifiers had delayed the project. To address this extensive and unanticipated contractor work, Change Order #17 was executed with PCL Construction, Inc. for \$1,011,737 which added 128 contract working days to July 1, 2016.

On November 15, 2017, the Public Works Department provided the sixth Project update. A total of 197 extra work items had been issued through Change Order #41. The costs for all extra work items totaled \$8,281,839 which represents 4.3% of the authorized change order contract amount. It was reported that additional SCADA system improvements, process control programming, start-up commissioning, MBR installation, solids handling improvements and underground conflicts had delayed the project. To address this contractor work, Change Order #41 was executed with PCL Construction, Inc. for \$3,075,000 which added 287 contract working days from November 3, 2016 to July 30, 2017.

DISCUSSION:

The City issued substantial construction completion and the City took over operation of all systems as of June 30, 2017. Therefore PCL Construction, Inc. met their Change Order #41 contract completion date. The City authorized additional time to extend the final project completion date from July 30, 2017 to September 18, 2017 in order to finish punch list items and demobilization activities. This time extension is covered in close out Change Order #53 and discussed below in the Project Close Out and Budget section.

Construction over the four-year and ten month Project term proved to be more complex than anticipated. This was mainly due to the rehabilitation of existing systems, adding new systems while continuing to operate the facility to achieve regulatory water quality requirements for discharge to the Santa Ana River. This situation required a conservative approach for the scheduled pace of construction and sequencing of the work.

The good news, and a testament to the hard work and diligence on the part of RWQCP staff, in coordination with Carollo Engineers as our construction management team and PCL Construction, Inc., is that even with the complicated construction there were no construction related effluent regulatory violations over the four-year, ten month project term.

The Project modernization includes best available technology and sustainable practices. Below are highlights of key improvements that are included in the Project:

- Membrane Bioreactor Treatment System (MBR) – This advanced treatment system provides much more consistent and higher quality water than the plant's existing

conventional sand filtration. The system uses an engineered membrane barrier that only allows certain particle sizes to pass through the membrane. Thus, it captures more material and the water quality typically is ten-times cleaner than sand filtration. The MBR system is a cornerstone of the improvements to comply with existing and future regulatory water quality requirements.

The City's MBR system is the third largest in the United States out of the over one-hundred systems currently in operation.

- Odor Control – A new odor control system has been installed at the plant headwork's building. Tank covers and odor control have been installed for all eight of the plant's primary sedimentation tanks. Foul air from the covered treatment systems is scrubbed clean using a biological air filter instead of chemical treatment.
- Plant Influent Flow Equalization - Installation of an influent flow equalization basin to capture wastewater flow at the start of the plant during high flow conditions and pump it back during low flow conditions at night. This system provides for a more consistent and cost efficient operation. The system will also help capture large storm surges when it rains to avoid plant wash out situations.
- New Organics Receiving Station – With this system, the facility can accept used grease and food waste from commercial businesses such as restaurants and food processing facilities. The benefits are two-fold. First, this waste product is kept out of a landfill. Second, the grease and food waste can be recycled by injecting the material into the digestion system for processing. The result is a dramatic increase in the amount of bio-methane gas produced that can be stored and reused as a fuel to generate energy.
- Diesel Stand-by Power Generation – The project includes the installation of standby power generation. When power is lost, the generators automatically start and supply power to the facility to ensure wastewater is treated to regulatory standards.
- Digester Bio-methane Gas Storage – A byproduct of the wastewater digestion process is the production of bio-methane gas. Bio-methane gas is a renewable resource and is used as a fuel for digester heating and the new 1.4 mega-watt fuel cell electrical generation system (produces about 40% of the total electrical demand). Installation of bio-methane storage allows for excess fuel to be stored and used when it is needed instead of having to pay for natural gas.
- Facility Treatment System Automation – Significant technology improvements are being made for automation of treatment systems so that they can self-adjust as needed to improve process control and performance.
- Digester Mixing System – The plant's four digester tanks treat and break down organic matter that has been removed from the wastewater as it is cleaned. The digesters require continuous heating and mixing to operate effectively. The mixers installed use less than one-quarter of the electricity that typical mixing systems use.
- Activated Sludge Air System – The activated sludge system is very energy intensive because air injected into the tanks is used by naturally occurring organisms in the wastewater to complete biological treatment. The new air diffusers that distribute air into

the tanks are much more efficient, reducing overall air and electrical power needs.

- Facility Storm Water Capture and Pumping – The storm water capture and pumping system is being improved so no on-site surface drainage can flow from the facility grounds. All above ground drainage from rain events, or from a tank rupture or spill, is contained onsite and captured in two lined ponds. Water from the capture ponds is pumped back to the head of the plant for treatment.

Project Close Out and Budget

PCL Contractors Inc., substantially completed construction and the City took over operation of all systems as of June 30, 2017. Therefore PCL Construction met their Change Order #41 contract completion date. The City did allow for a few extra weeks beyond the July 30, 2017 final completion date to finish punch list items and demobilization activities. The final construction completion notice was issued on September 18, 2017.

To close out the project, staff with its construction management consultant Carollo Engineers, conducted an extensive analysis of contractual terms, open work items, change order work, deficiency work and punch list items. Change Order #53 in the amount of \$250,000 was executed with PCL Contractors Inc., to address all remaining contract work and obligations.

As of Final Completion of the Project on September 18, 2017, a total of 296 extra work items had been identified through Change Order #53. The costs for these items total \$6,345,469.00 which represents 3.1% of the authorized change order contact amount. The current change order available balance is approximately \$6,147,720.87. It is worth noting that the change order percentage has been kept reasonably low considering the magnitude and complexity of the project. This favorable result is a reflection of the effort and the time City staff dedicated to the Project over the four year, ten month construction period.

Overall, the Project was completed under budget by \$6,147,720.87.

FISCAL IMPACT:

There is no fiscal impact to the General Fund. Sufficient funds for construction of the Project have been included in the recently adopted Sewer Fund two-year budget for fiscal years 2016/17 and 2017/18, RWQCP Phase 1 Plant Expansion account number 9821323-440301. The adopted sewer service rates set by Council are anticipated to be sufficient to make the bond payments associated with the revenue bonds issued to fund the construction project.

Prepared by:	Craig Justice, Deputy Public Works Director-Wastewater
Certified as to availability of funds:	Adam Raymond, Chief Financial Officer/City Treasurer
Approved by:	Al Zelinka, FAICP, Assistant City Manager
Approved as to form:	Gary G. Geuss, City Attorney

Attachment: Presentation