



Staff Report

TO: Mayor, and City Council Members
FROM: Kristine Day, Assistant City Manager
DATE: April 21, 2020
SUBJECT: **City Council Approval of Change Order No. 15 for the Wastewater Treatment Plant Upgrade/Expansion in the Amount Not to Exceed \$79,713.39**

Background and Analysis:

Wastewater Treatment Plant Change Order No. 15:

Item #1 – Aeration Basin 24” Air Piping Block-outs and Pipe Seals:

At the high-water level inside new aeration basins 1 through 4, the 20-inch aeration piping passes through the separation walls of each basin. The invert of the block out for the piping system is below the high-water level, which could cause unwanted cross flow into adjacent basins. Following the pipe installation, the block-outs will need to be sealed to provide a water-proof separation between basins and eliminate any potential for cross flow.

The cost for this work is \$14,550.23.

Item #2 – Modifications to HACH Instrumental Communications Protocol:

The original plant design included the following analog analyzers: 3 pH, 4 ORP, 1 Conductivity, 8 DO, and 1 TSS. The proposed changes replace the original analyzers with the following “smart controller” analyzers: 3 pH, 4 ORP, 0 Conductivity (combined with pH), 8 DO, and 1 TSS.

Each analyzer was analog and would deliver a 4-20ma signal to the supervisory control and data acquisition (SCADA) system. Using analog 4-20ma signals has been the industry standard but only allows instruments to “report back” results to the control system. During discussions with HACH (analyzer supplier), HACH offered newer smart instrument equipment at no cost to the project. The new equipment requires upgrades for hard wire installation such as fiber and additional components as well as additional training costs. In addition, there is a need for a local control panel to be installed at the

brine line metering vault which requires a change to the smart instruments and added approximately \$17,000. The startup and commissioning of the all the smart instruments was an additional cost of approximately \$10,000. The remainder of the additional costs are associated with the required networking of the instruments.

The benefits of the smart controllers include:

- All instruments have internet connection back to the plant's central control system so that more information can be sent and received between the analyzers and control system,
- Operations staff can see each instrument on their cell phone or other wireless devices, and
- Instrument calibration is greatly simplified due to online communication ability.

Smart instruments can identify when calibration issues arise and help prevent process disruptions. The water quality parameters being monitored by these instruments are very sensitive and critically important to the overall performance of the plant.

Preventing deviations in pH and conductivity will have significant positive impacts to the performance of the reverse osmosis (RO) system and minimize costs associated with brine discharge to the InInd Empire Brine Line (IEBL).

The cost for this work is \$60,534.92.

Item #3 – MBR Module Lifting Safety Device:

The membrane bioreactor (MBR) modules supplied by Fibracast for the project is a specialty one of a kind piece of equipment. Installation and removal of the modules into the tank basins require somewhat difficult crane rigging and harness to perform routine maintenance operations safely. The design engineer working with MBR equipment manufacturer Fibracast along with Advanced Industrial Solutions have recommended a lifting device that is ideally suited for MBR module lifting. The cost of the device is \$6,888 and is being split between the City and the contactor. The contractor will use the lifting bar for initial installation and the City will have the bar for future maintenance.

The cost for this work is \$3,444.32

Item #4 – RO CIP-Skid Discharge Orifice Plate Addition:

The RO CIP Skid supplied by H2O Innovations is used to clean the RO membranes, prolonging the life of the membranes. The pump boosts the pressure to the membranes and is used to recirculate and mix a cleaning solution. It is also used to pump spent

cleaning solution to waste. When used to pump to waste, a flow restriction was identified, for which a plate is required to maintain back-pressure on the pump. The design engineer and equipment manufacturer have reviewed the pump curves and sized an orifice plate to meet the design curve conditions for this pumping condition.

The cost for this work is \$1,183.92.

Summary of Change Order No. 15 Costs:

The cumulative costs associated with this change order is in the amount not to exceed \$79,713.39 and will not impact the project schedule. The costs for the change order are summarized below:

Item	Cost
Item #1 - RO-Sulfuric Acid Chemical Piping Material Change	\$14,550.23
Item #2 - Solids Feed Pump TE/TSH Thermocouple Elements	\$60,534.92
Item #3 - Solids Handling Bldg. Changes	\$3,444.32
Item #4 - RO CIP-Skid Discharge Orifice Plate Addition	\$1,183.92
Total:	\$79,713.39

Wastewater Treatment Plant Change Order Summary:

CO No.	Description	Reason for Change	Amount
1	MBR System Improvements	Enhance the performance of MBR System	\$149,741.00
2	RO System Electrical Modifications & Storm Drain System Material Change	Design & Material Updates	(\$245.00)
3	New Aeration Basin 1 through 3 Excavation	Conflict with Existing Utilities	\$19,998.00
4	Structural and Mechanical Modifications	Pre-Selected Submittals	\$57,450.64
5	Vactor Truck Dump Station Modifications	Conflict with Construction	NTE \$15,000.00
6	EDI/Fine Coarse Bubble Diffuser Equipment	Design Change	\$24,298.00

7	Various Changes – MBR/RO Structural, Site Civil & Headworks SCADA Design Modifications	Design Changes	\$59,167.49
8	Various Changes - Demolition, Piping Realignment, Material Change, and Electric Actuated Valve Voltage Change	Unforeseen Conditions and Value Engineering	\$6,067.00
9	Various Changes - Solids Handling Bldg. Conveyor Capacity Increase, Electrical Yard Vaults Cover Changes, Additional Pothole Investigation and Existing Duct Bank Removal, and Yard Utilities	Design Changes, Conflict with Construction, Owner Requested Changes	\$138,531.73
10	MBR Chemical Area Changes & Other Misc. Changes and Inclement Weather Impact Nov-18 to May-19	Owner Requested Changes & Inclement Weather	\$596,031.05
11	Frontier Internet Provider Duct Bank Modifications, 30-inch MBR & 20-inch Plant Effluent Pipeline Elevation and Alignment Modifications, Additional Safety Required Handrail at Retaining Wall and Generator	Design Changes, & Conflict with Construction	\$81,128.29
12	RO-Sulfuric Acid Chemical Piping Material Change, Solids Feed Pump TE/TSH Thermocouple Elements, Solids Handling Bldg. Changes	Design Changes, Owner Requested Changes	\$91,417.26
13	Plant Effluent Chemical Area Changes	Owner Requested Changes	\$404,821.33
14	ADA Compliance Men's – Women's Restroom Modifications, SCE Required Additional 4/0 Ground Cable in DB 201	Design Changes	\$12,311.12
15	Aeration Basin 24" Air Piping Block-outs and Pipe Seals, Modifications to HACH Instrumentation Communications Protocol, MBR Module Lifting Safety Device, RO CIP-Skid Discharge Orifice Plate Addition	Design Changes, Owner Requested Changes	\$79,713.39

WWTP Contingency	Budget Amount	Change Orders 1-15	Remaining
	\$4,000,000.00	\$1,735,431.30	\$2,264,568.70

Fiscal Impact:

Wastewater Treatment Plant Expansion/Renovation:

The project accounting below represents the status of funds should the change order be approved by City Council, leaving a contingency balance of \$2,264,568.70.

WWTP	Budget Amount	Paid to Date	Remaining
Design	\$2,709,798.23	\$2,556,828.66	\$152,969.57
Construction Management	\$5,308,585.72	\$3,196,897.65	\$2,111,688.07
Equipment	\$252,906.00	\$253,362.91	(\$456.91)
Permits	\$324,776.76	\$87,429.79	\$237,346.97
Construction	\$53,912,177.00	\$32,254,972.71	\$21,657,204.29
Contingency	\$4,000,000.00	\$907,213.21	\$3,092,786.79
Total	\$66,508,243.71	\$39,256,704.93	\$27,251,538.78

Recommended Action:

Approval of Change Order No. 15 for the Wastewater Treatment Plant Upgrade/Expansion in the amount not to exceed \$79,713.39.

Attachments:

- A. Change Order No. 15