Staff Report

TO: City Council

FROM: Kristine Day, Assistant City Manager

DATE April 20, 2021

SUBJECT: **City Council Approval of Change Order No. 19 for the Wastewater Treatment Plant Upgrade /Expansion in the Amount Not to Exceed $98,556.60 for the Installation of Aeration Basin Risers, Aeration Basin Network Switch, High Level Alarm for the Fine Screens and the Addition of Actuators at the Influent Gates**

Background and Analysis:

Wastewater Treatment Plant Change Order No. 19

The expansion of the City's wastewater treatment plant (Plant) began construction in October 2018. Phase I of construction has been completed and the contractor, WM Lyles, is making good progress on Phase II.

Item 1: Aeration Basin 1-4 MOV Extension Riser Addition

This change is to allow for safe access. Each of the four aeration basins has a motor operated valve that controls air flow to the aerobic zones in the basins. The valve controller is located directly on the valve and air piping manifold within the basins above approximately 18-feet of concentrated mixed liquor wastewater. This creates a workplace safety hazard for maintenance and repair operations. City staff or a repair technician would be required to lie in a prone position or crawl outside of safety railing on to piping to adjust or repair valve equipment.

Design and Scope Changes

1. Add a 48-inch valve extension stem and elevate valve controller to an accessible height.
2. Contractor to include all necessary labor for conduit, wiring and termination adjustments to disconnect and reconnect the valve controller at its new location.
3. Cost proposal to include all necessary costs for labor and miscellaneous materials to perform this change. Contractor shall not perform any work until change has been approved by the City.

Cost Impact: MWH Constructors, Inc., has reviewed the attached WM Lyles cost proposal and find it acceptable. Accordingly, a contract cost increase of $11,028.75 to be executed in a change order for the modifications is requested.

Item 2: Aeration Basin – Network Switches for HACH Instruments

This change involves a network reliability improvement which is critical for process analyzers. Liquid process analyzer transmitters were upgraded in a previous approved and executed design change. The initial intent was for the HACH sc4200 transmitters to access the network via wireless connectively. With the spotty Wi-Fi access and occasional signal loss due to long distances it is now necessary to hardwire the devices to the network via CAT6 cabling. The cost to install field data switches and cabling for aeration basins 1 and 2 have been covered by the equipment vendor, HACH. The cost for basins 3 and 4 that are now in construction includes additional conduit and cabling and has been requested in Design Clarification-38.

Design and Scope Changes

1. Provide conduit and wire to connect the following AITs 2151, 2152, 2251, 2252, 2351, 2352, 2451, 2452, 2111, 2211, 2311, 2411 to the 18-port data comm switches located in pull box JB-2111 and JB-2311; and
2. Cost proposal shall include all necessary costs for labor and miscellaneous materials to perform this change. Contractor shall not perform any work until change has been approved by the City.

Cost Impact: MWH and Network design engineer, SKM Engineering, has reviewed the attached WM Lyles cost proposal and find it acceptable. Accordingly, a contract cost increase of $14,093.21 to be executed in a change order for the modifications is requested.

Item 3: Fine Screens – Addition of a High-Level Alarm Float Switch

This change will provide operations with advanced notice of a potential overflow of the fine screen. A high-level float switch is to be added to the fine screen splitter box to provide an alarm in case of high liquid level upstream of fine screens.

Design and Scope Changes

1. Provide and install a high-level float switch as indicated on revised drawing FSM-1, PI-05 and LE-05. The high-level float switch shall be installed so that an alarm is triggered once the liquid elevation reaches a level of 3'-4" above the finished floor of the influent box (Note that this level may need to be adjusted following flow testing of screens);
2. Route the float switch cable to a small NEMA 4X Junction Box adjacent to the float switch location (a minimum 18" above top of wall) and provide an intrinsically safe barrier (120VAC powered) inside the junction box. Three #12 with #12 ground wires will need to be routed to the junction box from RIO-HW. To accomplish this, utilize conduit C1711 from RIO-HW to HH-105 and then from HH-105 route the wires through one of the underground conduits that is being used for lighting. See drawings CE-05 and CE-18; and
3. Cost proposal shall include all necessary costs for labor and miscellaneous materials to perform this change. Contractor shall not perform any work until change has been approved by the City.

Cost Impact: MWH Constructors, Inc., and network design engineer, SKM Engineering, has reviewed the attached WM Lyles cost proposal and find it acceptable. Accordingly, a contract cost increase of $11,639.14 to be executed in a change order for the modifications is requested.

Item 4: MBR – Addition of Influent Gate MOV Actuators

This is a system required change to optimize operational maintenance and efficiency. The MBR system is operated via a SCADA system with all components being networked together. Isolation slide gates precede each of the four MBR trains and are used to stop flow to the train for weekly, routine cleanings and when long duration maintenance events are required. The current gates are manually operated requiring City staff to man the gates whenever the electronic system requests the gates to be opened and closed, be it for normal scheduled cleanings or an emergency shutdown occurrence. City wastewater treatment duties require offsite as well as onsite responsibilities during their shifts and there may be instances where City staff may not be available to operate the manual gates in timely manner.

Design and Scope Changes

1. Provide and replace the manual slide gate actuators with MOV actuators as described below:
   All of the MBR influent gates (G-3101, G-3201, G-3301, G-3401 and future G-3501*) have been updated to operate via motorized actuators (see PI-09 and LE-09). The actuators will be powered with 120VAC from LP-MB3, as shown on E-

15 and E-23. Signal will be 24V and feed back to RIOMB (see I-16 and I-17). Existing conduits will be used to provide both power and signal wiring. Two #12 wires and a #12 ground will be added to each of the power conduits: P3191, P3291, P3391 and P3491. Future conduit P3591 will be used to power future gate G-3501. See drawings CE-02 and CE-22. Eight #14 wires will be added to each signal conduit: S3192, S3292, S3392 and S3492. Future conduit S3592 will be used to provide signal to future gate G-3501. See drawings CE-07 and CE-22,

2. Modify slide gates. The required modifications are generally limited to stem replacement and providing supports for actuator mounting. Attached to this clarification are pertinent drawings from Hydro Gate and proposals received to date. All dimensions shall be verified and coordinated with vendor prior to construction. Final actuator data and gate drawings shall be provided to the Engineer for review and approval; and
3. Cost proposal shall include all necessary costs for labor and miscellaneous materials to perform this change. Contractor shall not perform any work until change has been approved by the City.

Cost Impact: MWH Constructors, Inc., and the design engineer, Aqua Engineering, have reviewed the attached WM Lyles cost proposal and find it acceptable. Accordingly, a contract cost increase of $58,795.50 to be executed in a change order for the modifications is requested.

Summary of Change Order No. 19 Costs:

The cumulative costs associated with this change is in the amount not to exceed $95,556.60. The costs are as summarized below.

Item	Cost
Item #1 – Aeration Basin 1-4 MOV Extension Risers	$11,028.75
Item #2 – Aeration Basin Network Switch for HACH Instruments	$14,093.21
Item #3 – Fine Screens – Addition of a High-Level Alarm Switch	$11,639.14
Item #4 – MBR Addition of MOV Actuator on the Influent Gates	$58,795.50
Total:	**$95,556.60**

Fiscal Impact:

WWTP	Budget Amount	Paid to Date	Remaining
Design	$2,697,942.63	$2,557,938.51	$140,004.12
Construction Management	$5,382,475.75	$5,206,826.88	$175,648.87
Equipment	$252,906.00	$256,216.13	$(3,310.13)
Permits	$324,776.76	$121,450.10	$203,326.66
Construction	$53,910,737.00	$44,677,882.04	$9,232,854.96
Contingency	$5,624,252.52	$1,980,086.66	$3,644,165.86
Unallocated	$2,441,341.72	$-	$2,441,341.72
Total	**$70,634,432.38**	**$54,800,400.32**	**$15,834,032.06**

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 and Storm Drain System Material Change	Design and 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 and 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 Vault 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 and Other Misc. Changes and Inclement Weather Impact Nov-18 to May-19	Owner Requested Changes and Inclement Weather	$596,031.05
11	Frontier Internet Provider Duct Bank Modifications, 30-inch MBR and 20-inch Plant Effluent Pipeline Elevation and Alignment Modifications, Additional Safety Required Handrail at Retaining Wall and Generator	Design Changes, and Conflict with Construction	$81,128.29
12	RO-Sulfurtic Acid Chemical Piping Material Change, Solids Feed Pump TR/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 and SCE Required Additional 4/0 Ground Cable	Design Changes and SCE Requirements	$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
16	Pump station at the EQ Basin	Design Changes, Owner Requested Changes	NTE $667,487.82

17	RW FUTURE PUMP STATION, Weather Time Extension, Valve Modifications, MBR Feed Pump Seal Water Control Changes	Design Changes, Owner Requested Changes, Unforeseen Conditions	NTE $159,442.86
18	Construction Cost of UV System, Weather Time Extension	Design Changes, Unforeseen Conditions	NTE $1,788,568.52
WWTP Contingency	**Budget Amount**	**Change Orders 1-18**	**Remaining**
	$5,624,252.52	**$4,350,930.50**	**$1,273,322.02**

Recommended Action:

Staff recommends City Council approval of Change Order No. 19 for the Wastewater Treatment Plant Upgrade and Expansion in the amount not to exceed $98,556.60 for the installation of aeration basin risers, aeration basin network switch, high level alarm for the fine screens and the addition of actuators at the influent gates.

Attachments:

A. Change Order 19