



Memo

To: Trent Epperson, City Manager
From: Doug Box, Interim Utilities Director
CC: Jameson Appel, Assistant Director of Capital Projects
David Sohns, Director of Utilities
Shaun Gilmore, Surface Water Treatment Plant Manager
Date: June 15, 2023
Re: Surface Water Treatment Plant (SWTP) Update

6/21/2023
To: Mayor and City Council
SWTP Update. The project continues to struggle with material and equipment delays but no increased costs and water scheduled to be in the system now in September.
- Trent

Executive Summary

This memo provides information about the progress on the Surface Water Plant project's current financial and schedule status. This memo details the start-up process currently in progress. The project remains in budget, but the schedule remains fluid as it continues to be impacted by supply chain issues. The projected completion date (Water into the System) is now estimated for September 2023 with completion of the final construction activities estimated for December 2023.

Background

The project entails the design and construction of the City's 10 million gallon per day (MGD) surface water treatment plant intended to supplement the City's drinking water supply to meet current and future demands. The project includes the construction of approximately five miles of water transmission line to supply water to the Kirby Water Plant and the FM521 Water Plant on the west end of town allowing the Alice Street system to manage the east end demands. The project also includes the extension of the City's fiber network to provide operational connectivity to these receiving plants and a redundant Data Center to be housed in the Surface Water Plant's Operations Building. The project is being delivered through the Construction Manager At Risk (CMAR) process with PLW Waterworks performing CMAR activities. The last Change Order (#8) to the CMAR's contract was approved by Council in March 2022 and consisted of Owner requested Work Change Directives (WCD's) 1, 2 and 3 increasing the total contract Guaranteed Maximum Price (GMP) to \$137,075,681. There are no pending change orders at this time.

Schedule Update

The schedule remains fluid with new material and equipment delays identified almost weekly and this trend remains the primary concern for the project and one that occupies a great deal of time and effort from the project team to generate work-arounds. Recently, the project team received word that the last two generators currently not onsite would be delayed until May of 2023. Discussions with the manufacturer determined that temporary generators would be provided, at no cost to the CMAR, if the delivery schedule continues to slide.

The chlorine room gas evacuation system, consisting of fiberglass exhaust duct and a larger exhaust fan provided by a separate manufacturer, has been delayed by manufacturing schedules. A temporary replacement duct and fan housing were identified and ordered to allow the system to be complete and functional in time for the phased plant start up.

The project continues to struggle with the availability of American Iron and Steel (AIS) compliant pipe, valves and fittings. In locations where it was possible and with the engineers' agreement, some of this material has been replaced with HDPE. In some cases, a temporary non-AIS component has been used to complete a critical system likely requiring it to be replaced when the actual components become available. In one

instance the City is relying on a de minimis exemption to allow minor components of a manufactured system to contain imported fittings. In early December (2022) the Team met with EPA officials to discuss the AIS compliant component availability and its impact to the critical path items of the schedule. The City applied for and was granted two waivers, (in January 2023) for valves and check valves after the EPA confirmed domestic products meeting these specifications were not available in the current supply market. Fitting availability stopped progress on the transmission lines for four months and only recently restarted. This issue is not confined to pipe and fittings. All forms of steel and iron products are affected by these supply chain issues. Other items include electrical equipment, fabricated fiberglass products and even roofing materials availability and price have been affected.

Despite the nearly daily identification of new material and equipment delivery delays, the Water into the System schedule is now projected for September 2023 and Final Completion of Construction projected for December 2023.

Construction Progress

Operations Building construction is virtually complete. Interior work has progressed well: the building has been climatized, the majority of millwork has been completed, and the IT servers from the City have been installed in the SCADA room.

In the Administration Building (Admin) the decorative floor area in the public access area has been polished, the interior wall façade has been assembled, and the majority of millwork has been completed. In the High Service Pump Room, the pumps and motors have been installed and all piping connected.

The Chlorine Building roof membrane has been installed and received Windstorm inspections. Outside of the building, the bulk storage area is almost completed with handrails and eyewash stations. With the temporary substitution of an alternative scrubber blower housing, mentioned above, this facility will be ready to receive gaseous chlorine by the time the plant startup process requires this on site.

GAC (Granulated Activated Carbon) filters have been installed on their foundations and the majority of piping has being installed. The GAC media will not be installed until the plant is running to avoid accidental damage to this material.

Membrane Racks have been installed within the membrane building along with settled water strainers, pumps and pipping work. The majority of pipe painting is complete. Airline routing and potable water supplies are being field fit. The Membrane manufacturer's technical representatives have begun visiting the jobsite to ensure proper installation and consulting on instrumentation in preparation of pipe flushing and initial testing procedures. CMAR is continuing its startup of individual equipment and certification of proper installation.

The plant ethernet fiber is being terminated at the various buildings beginning to create the supervisory control and data acquisition (SCADA) system SCADA engineers are checking equipment and instrumentation connections, programing programable logic controllers (PLCs) and continuing to write the operational logic for the plant. Recent completion of the plant's MDF/ Server Room and fiber connection to the City's network has allowed on-site work to begin.

In keeping with the City's IT Department request, the CMAR and the SCADA programmers have begun work to completely revise the plant's IP Addressing scheme to make it a Level Three scheme. This affords the plant a higher level of data security and makes internal communications more efficient. This effort requires

replacing the IP address in every piece of equipment that will communicate on the SCADA system. SCADA programmers and the CMAR are working to make this change without added cost or impact to the schedule.

Site work is still progressing well. The sanitary lift station wet well structure has been completed and has been coated along with sanitary manholes throughout the site. The storm drainage outfall has been constructed tying the site drainage into Mustang Bayou. The paving contractor has progressed the plant roadway around the west end and is now working to connect the south and north side roads. The plant's north entrance has been upgraded with the completion of the left turn lane on County Road 48 (Kingsley).

Within the process units: Raw Water Lift Station, Pre-Treatment, and Solids Handling (wash water recovery, gravity thickener, belt presses) equipment is being started up and inspected by the manufacturer's representatives to provide Certification of Proper Installation (COPI). These vendors, while onsite conducting COPI certifications, are also performing vendor-based training for the City's plant operations and maintenance staff for these components. Those equipment components that require routine exercising are being run routinely to meet manufacturer's requirements under the supervision of plant staff.

Budget Update

There are no pending Change Orders or additional Owner Directed Changes with the CMAR at this time. As noted below in the Budget table, the Original Project budget was \$175,500,000. Current expenditures total \$150,660,516.78 and the remaining encumbrances on current contracts total \$24,093,061.38, resulting in a total spend of \$174,753,579, leaving a project contingency of \$ 746,421.00. As of the February 2023 Pay Estimate the project is 91% complete by pay with \$126,435,623.55 paid and 94% complete by time with 1386 days used out of 1431.

Budget:

Funding Sources	Series	To Date	Future	Total Budget
W/S Revenue Bonds	2017B	6,012,500		6,012,500
Impact Fee - Debt	2017B	6,012,500		6,012,500
W/S Revenue Bonds	2018A	4,325,000		4,325,000
Impact Fee - Debt	2018A	4,325,000		4,325,000
W/S Revenue Bonds	2019A	10,500,000		10,500,000
Impact Fee - Debt	2019A	10,500,000		10,500,000
W/S Revenue Bonds	2020A	53,800,000		53,800,000
Impact Fee - Debt	2020A	53,800,000		53,800,000
W/S Certificates of Obligation	2022C	10,490,000		10,490,000
Impact Fee - Debt	2022C	10,490,000		10,490,000
	TBS			
W/S Certificates of Obligation	2023		2,622,500	2,622,500
	TBS			
Impact Fee - Debt	2023		2,622,500	2,622,500
Cash				-
Other Funding Sources				-
Total Funding Sources		170,255,000	5,245,000	175,500,000

Expenditures	To Date	Future	Total
PER	8,773,058		8,773,058
Land	179,121		179,121
Design	16,375,496		16,375,496
Construction	142,546,976		142,546,976
Construction Management/Inspection	5,100,448		5,100,448
Construction Materials Testing	462,860		462,860
FF&E	1,315,620		1,315,620
Total Expenditures	174,753,579	-	174,753,579

Project Contingency	0.4%	746,421
Project Balance		(0)

Schedule Info:

	Base Line	Current
Design Start - Package 1	August-19	September-19
Design Start - Package 2	February-19	March-19
Design Start - Package 3	August-19	September-19
Bid Start	March-20	January-19
Construction Start	May-20	June-20
Construction Completion	December-22	September-23

*September-2023 is current schedule for water in the system with substantial completion in December-2023

Start-Up Planning

The activities of **Loops 1 and 2** were completed using raw water from the canal and returning that water to the canal. This tested out the Raw Water Pumps, vertical screens, raw water piping and portions of the Pre-Treatment structure and equipment.

Loop 3

Loop 3 will flush the membrane supply piping and then begin to test membrane rack functions without the membranes installed. This test will exercise all the functions of the membrane racks and associated equipment without jeopardizing the membranes themselves, including all three versions of membrane cleaning, the cleaning chemical systems and tanks, and the GAC backwash system. This loop is now scheduled to begin in July and has been delayed by the installation of the Compressed Air System piping (material delays) and the lack of availability from H2O Innovations startup and commissioning staff. H2O authorized the CMAR to use settled water for Loop 3 testing instead of the planned well water making the process slightly less complicated. The CMAR has evaluated the benefits of using settled water for this activity and the changes to the testing procedures for this water source. The CMAR has developed flushing plans for using settled water during Loop 3 testing and will return flushed water to the canal.

Loop 3 represents the largest hurdle to surmount prior to actually making drinking water. As it will also include testing backwash processes, the GAC Absorbers and their cycles as well as the plant water loop and its pumps and SCADA controls of all of these systems.

Loop 4

This Loop, now scheduled to run in conjunction with Loop 3, will introduce flocculation chemicals through the static mixers upstream of Pre-Treatment to produce settled water. The process will produce sludge allowing the CMAR to begin testing the solids handling and removal systems. The settled canal water will then be cycled back to the GCWA canal until it reaches the required 2 Nephelometric Turbidity Unit (NTU) or less. Regular reporting to TCEQ for acceptance of the Pre-Treatment can begin once this value is achieved and sustained. TCEQ acceptance can take up to 60 days for paperwork to catch up with activities. For this reason, once that value is achieved and testing confirms compliance, the water will be suitable for feeding the membranes allowing the plant to make clean water. Once meeting turbidity targets, settled water will be used to flush Loop 3 lines in advance of Loop 3 testing.

Loop 5

This loop, now scheduled to begin in August 2023, is the Finished Water storage/disposal loop. Upon completion of the clean water membrane flow and cleaning tests and approval of the Pre-Treatment unit's settled water quality, the membrane manufacturer will approve the introduction of Settled Water to the Membranes. The membranes will then undergo performance testing and cleaning checks and the manufacture will begin proving the system meets chemical and energy performance requirements in compliance with the specifications. At this point the plant is making Clean Water. Once the water meets drinking water quality it will be stored in the GST and used to flush the transmission lines. Once all three racks are in production, the plant will be making about 3 to 4 million gallons during an 8 to 10 hour operational day and water that cannot be stored or used in flushing will be de-chlorinated and released into Mustang Bayou. The transmission line flushing process will require several flushes to clean the lines of construction debris and obtain clear biological tests. This water will be pushed from the Surface Water Plant to the receiving plants at Kirby and Shadow Creek (FM521). The flushing process will require dichlorination at the receiving plants and then spilling out to drainage systems prompting the need to notify the public that this is a purposeful activity and not a leak. The City has begun purchasing the full 10 MGD of water from GCWA. The flushing process provides the opportunity to adjust plant processes to fine tune water quality while ensuring the transmission lines are free of debris, chlorinated and fully tested.

Once the plant water quality has been accepted by TCEQ as meeting drinking water quality standards the project will produce water for final introduction into the distribution system. This is scheduled for late September 2023.

This schedule represents the evolving start up process and is subject to delays as equipment operation is refined and fine-tuned and problems encountered are resolved. The Water into the System date presented above is a conservative estimate of receipt of TCEQ's final approval of the plant and the water quality.

Staffing Update:

Staffing for the plant is proceeding as planned with recruitment and hiring as of May 12th, as follows:

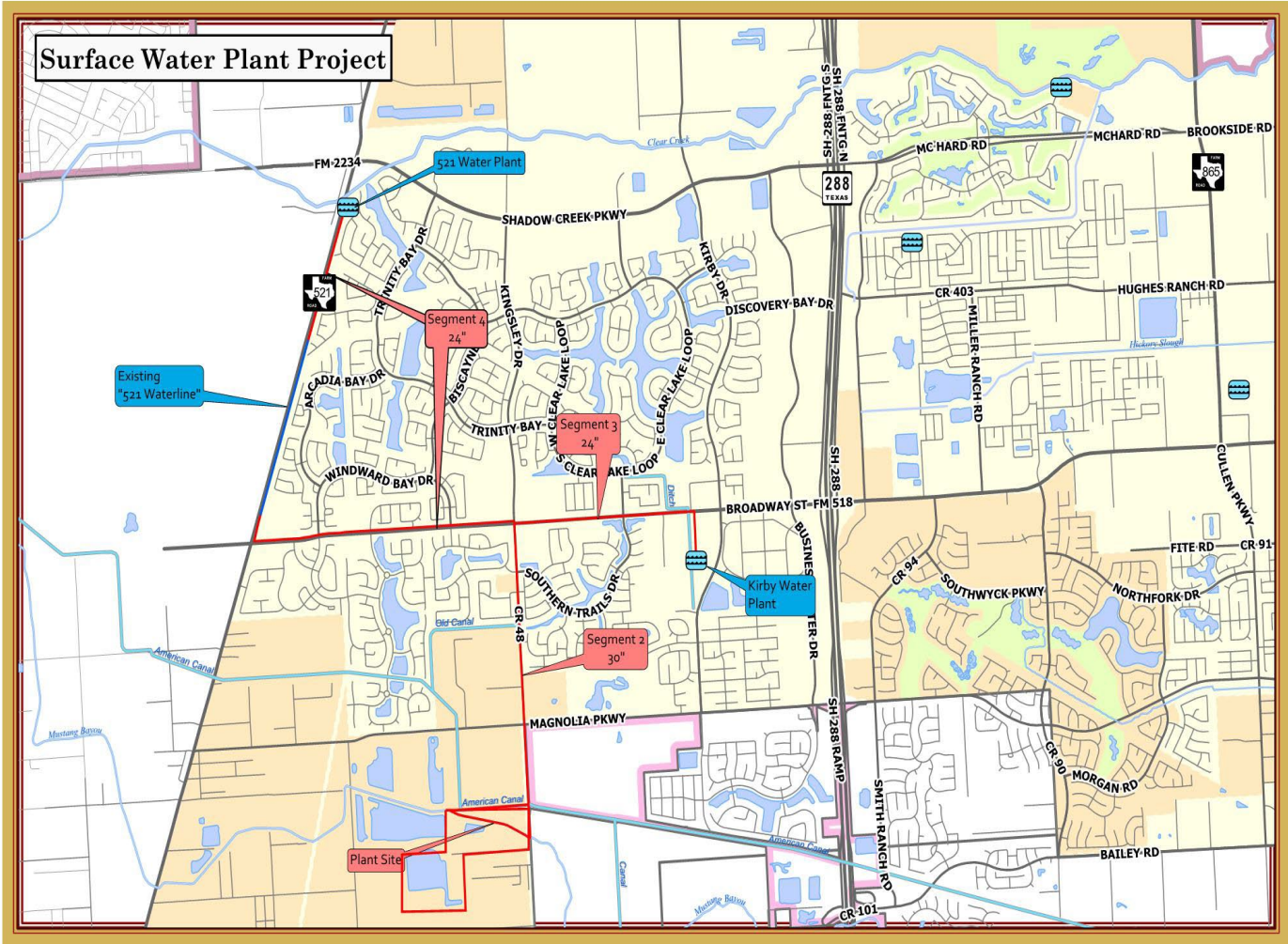
Surface Water Treatment Plant Manager – Hired
Process Control Supervisor – Hired

Operator II – Hired
Operator I – Hired
Lab Tech – Hired
Maintenance Coordinator – Hired
Plant Mechanic – Hired
Plant Mechanic – Hired
Instrument Technician – Hired
Electrician – Hired
Operator II – Taking applications
Operator I – Taking applications
Operator I – Taking applications

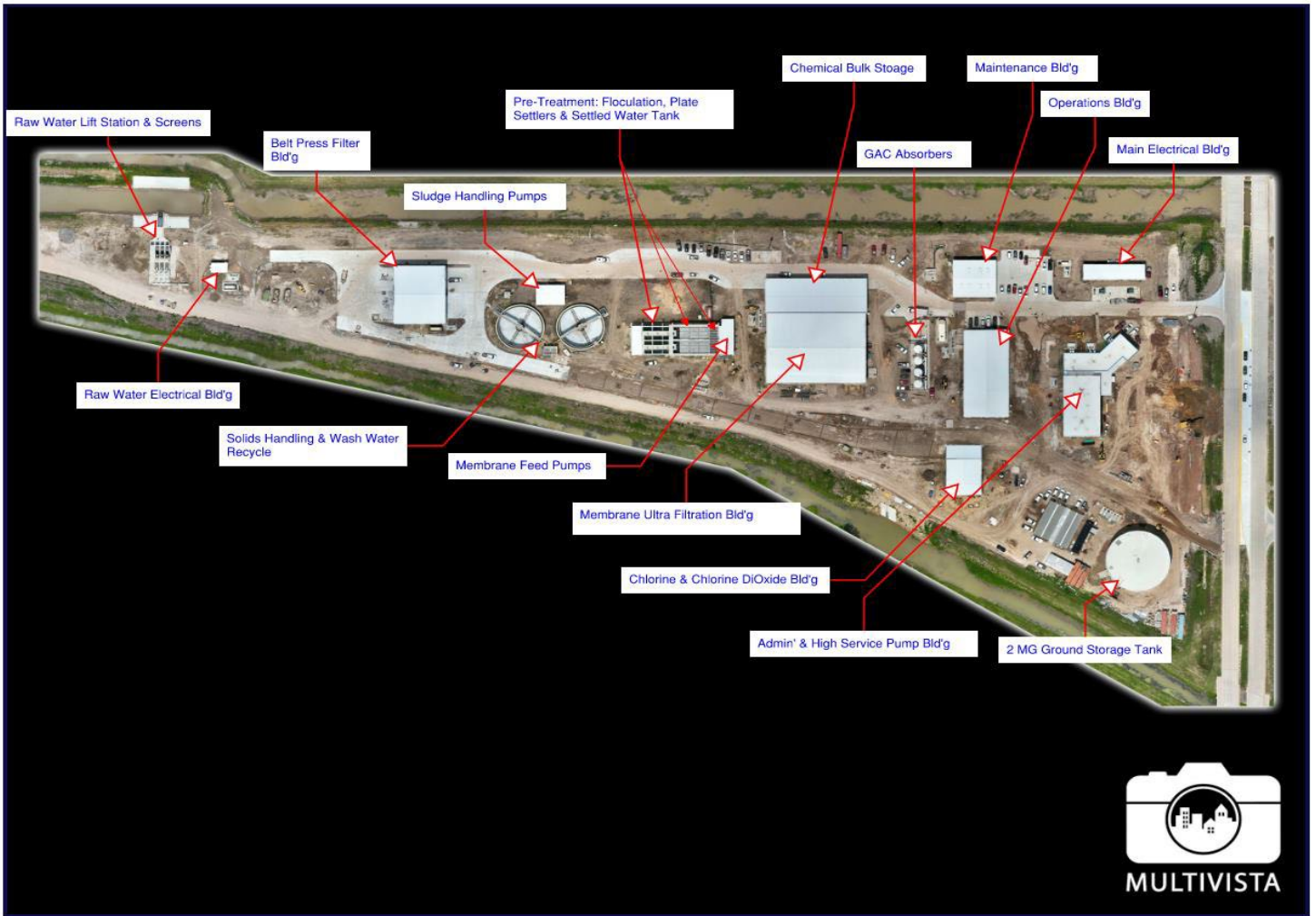
Previous Memos:

6/16/16, 2/2/17, 3/9/17, 4/13/17, 3/29/18, 4/19/18, 1/10/19, 2/21/19, 3/28/19, 8/1/19, 8/8/19, 1/23/20, 3/05/20, 4/16/20, 9/17/20, 3/4/21, 6/10/21, 7/29/21, 11/4/21, 3/10/22, 4/14/22, 5/5/22, 7/14/22, 9/15/22, 11/17/22, 2/23/23, 4/10/23

Project Map:



Project Photos:



City of Pearland - Surface A Water Treatment Facility - Aerial Slideshows - April 11 2023 - Photo 28

Site Facility Function Identification



Westerly view from County Road 48 showing roadway progression



High altitude shot of overall site showing roadway pavement progression



Public facing view of the plant, Administration and High Service Pump Building



PreTreatment Unit with Flocculation Cells in foreground & Plate Settlers in background



Raw Water Lift Station with Vertical Screens and Main Influent line in background



WashWater Recovery & Gravity Thickener



Above, Paving forms for south driveway, plant exit

Below, Completed Paving along south side of plant

