



Memo

To: Clay Pearson, City Manager

From: Skipper Jones, Assistant Director – Capital Projects

CC: Trent Epperson, Assistant City Manager
Robert D. Upton, P.E., Director Engineering
Clarence Wittwer, Director Public Works
David Van Riper, Assistant Director Public Works

Date: September 17, 2020

Re: Surface Water Plant Engineering Construction Phase Services

15 September 2020
To: Mayor and City Council members
Good and clear update and preview for the intricate and complex Surface Water Treatment Plan. Foresight and experience making progress and saving money on very important investment for water, examples shared about the pre package and how that is paying off. Pictures after text show the progress to date. State TWDB causing some delays overall. Clay

Purpose

This memo provides information about the progress on the Surface Water Treatment Plant project's current status and the forthcoming proposed award of the Balance of Plant GMP for the CMAR, three contract Amendments for Engineering Construction Phase Services and one additional Task Order for Owner's Representative Construction Phase Services. These contracts are scheduled for presentation to Council on the September 28, 2020 meeting agenda.

Background

The Surface Water Treatment Plant project is designed to provide up to 10 million gallons per day (MGD) of safe clean drinking water for the citizens of Pearland beginning in January 2023. This facility will supplement ground and other surface water sources currently in operation and reduce the City's dependence on expensive water supplied through an existing take or pay contract with the City of Houston on the far west side of the City.

Design of the facility was split into 3 design packages and awarded separately with Freese & Nichols managing Package 1: Site Drainage and Raw Water Lift; CDM-Smith managing Package 2: Treatment Plant and associated facilities; and Stantec managing Package 3, high service pumps and building, ground storage and transmission lines.

Council awarded the Construction Manager At Risk Pre-Construction Services contract to PLW Water Works in April 2019 and awarded the Early Works Package 1 (EWP1), in the amount of \$7,479,256.00 in February 2020. TWDB issued a final approval in late April for this package. Early Works Package 2 (EWP2) was awarded in April 2020 in the amount of \$13,758,502 and TWDB issued their approval in mid-June.

Current Status

Work on portions of the two Early Works Packages began on site almost immediately with large portions of the rough site work and drainage now underway or partially complete. Soil foundation work for the plant's several buildings and ground storage tank are also now nearing completion. Deep foundation work is well underway on the thickeners and wash water recovery basins. The Early Works package has allowed the deep foundation work to be done without the need or cost of expensive shoring. Progress on the early works packages is observable in aerials photos attached to the end of this memo. The site rough grading and

preliminary drainage is in place making the site workable even after the heavy rains experienced in late July and early August.

The CMAR received bids for the manufacture and supply of plant membrane units in late-February 2020 and Staff has recently completed work with the Design Consultant to negotiate final equipment package details to improve the performance of the membrane equipment and to incorporate manufacturer performance recommendations. These were necessary to obtain the increased thru-put capacity desired. The membrane package, consisting of three racks of membrane modules, piping, valving, pumps, instrumentation and controls, will have the ability and capacity to process the required 10 Million Gallons per Day (MGD) of drinking water.

All three design consultants submitted plans and specifications to TCEQ for final approvals in July. At this time TCEQ has completed their reviews of Packages 1 and 2. All three Packages were also submitted to the City for permitting in early August on schedule. Plans have been designated as ISSUED FOR BID as they have not been finally approved by TCEQ, TWDB or the City constituting approximately 90% design level of effort. The CMAR advertised for bids to his pre-qualified bidders and held Pre-Bid meetings July 7th and 10th to answer any questions and provide clarifications for all bid packages. The packages contain the **Balance of Project (BOP)** work and form the basis for the CMAR's final GMP. Bid packages were assembled to maximize the economies of scale including labor, material and equipment where possible. Other, "Equipment Only" packages were developed to group like equipment, such as pumps, into one purchase to capture these economies.

Bids were received in August and the CMAR has reviewed and analyzed each bid to ensure that the sub-contractor or vendor has included the entire scope of work and understands all specifications. The vetting process has included interviews of perspective sub-contractors in which Staff and the Owner's Rep have participated to ensure qualified sub's are awarded contracts and that cost reduction recommendations from these sub's were taken into consideration for Value Engineering purposes.

The CMAR submitted bids to self-perform three packages within the BOP work and was low bidder on two of those: Yard Piping and Membrane and the Chemical and Granular Activated Carbon (GAC) facilities. The third package was the Dewater Deep Structure Equipment package which will ultimately be awarded to the low bidder, an MBE contractor. In all such cases, the CMAR submitted his bid to the Owner's Representative 24 hours before competitors bids were received.

Working from the submitted results the CMAR delivered a **preliminary GMP** in late August along with a list of potential Value Engineering options that, once analyzed, could reduce the Cost of Work by as much as \$1 million dollars further. That Preliminary GMP is currently \$135,997,681. This is the **total for ALL Work INCLUDING the Pre-Construction Services (\$1,092,320) the previously awarded Early Works Packages totaling \$21,237,758** leaving the **Balance of Project Costs of \$113,667,603**. As VE items are reviewed and accepted the GMP will reduce further. Staff will present this Guaranteed Maximum Price (GMP) to Council for approval and award on September 28th.

The following table lists the packages and their respective costs that make up the balance of project work that produce the GMP.

GMP Cost Breakdown

Cost of Work	
EWP1	\$ 6,970,160
EWP2	\$ 12,866,502
Balance of Plant	<u>\$105,728,304</u>
Total Cost of Work	\$125,564,966
Fee*	\$ 6,023,378
Preconstruction	\$ 1,092,320
Bonds and Insurance*	<u>\$ 3,317,017</u>
TOTAL GMP	\$135,997,681
Authorizations	
Preconstruction	\$ 1,092,320
EWP1	\$ 7,479,256
EWP2	\$ 13,758,502

Balance of Plant	\$113,667,603
-------------------------	----------------------

Balance of Plant – Cost of Work

General Conditions	\$ 6,986,600
Site Logistics	\$ 3,916,812
Bid Pkg 02.04 Transmission Lines	\$ 15,928,205
Bid Pkg 02.05 Yard Pipe	\$ 8,096,100
Bid Pkg 02.06B Site Paving	\$ 2,391,534
Bid Pkg 02.06D Site Fencing	\$ 365,000
Bid Pkg 11.02 Hor. Split Face Pumps	\$ 230,677
Bid Pkg 11.03 Vertical Turbine Pumps	\$ 792,678
Bid Pkg 11.04 Submersible Pumps	\$ 556,570
Bid Pkg 11.05 Slide and Weir Gates	\$ 66,780
Bid Pkg 11.06 Dewatering Equipment	\$ 1,887,000
Bid Pkg 11.07 GAC Equipment	\$ 2,094,635
Bid Pkg 15.01 Pipe and Valves	\$ 3,792,000
Bid Pkg 16.01 Electrical & Controls	\$ 18,482,096
Bid Pkg 16.04 Generators	\$ 1,559,867
Bid Pkg 20.01 RWPS	\$ 4,544,570
Bid Pkg 20.02 Dewater Complex	\$ 4,009,000
Bid Pkg 20.03 Pre-Treatment	\$ 4,232,500
Bid Pkg 20.04 Membrane Complex	\$ 14,338,000
Bid Pkg 20.05 Commercial Bldgs	\$ 11,182,680
Bid Pkg 20.06 Control Structure	\$ 275,000

*Total of All Packages

In the interim, the final plans from all three design packages have been sealed and submitted to City Plan Review for permitting. Any changes coming out of the permitting process will be handled by internal change orders between the CMAR and their Sub-Contractors **without impacting the GMP**.

Budget Info

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 Revenue Bonds			14,562,500	14,562,500
Impact Fee - Debt			14,562,500	14,562,500
Total Funding Sources		149,275,000	29,125,000	178,400,000

Expenditures	To Date	Future	Total
PER	9,376,810		9,376,810
Land	59,455	500,000	559,455
Design	12,415,111	2,950,992	15,366,103
Construction	22,330,078	113,667,603	135,997,681
Construction Management/Inspection		3,125,014	3,125,014
Construction Materials Testing	462,860		462,860

FF&E		2,000,000	2,000,000
Total Expenditures	44,644,313	122,243,609	166,887,922

Project Balance/Contingency	11,512,078
------------------------------------	-------------------

*Project budget and contingency will be reviewed, and final project budget will be reflected for future debt sales.

Schedule Info

At this time, the Design portion of the project is largely complete with minimal design or plan changes anticipated for permitting and final State approvals. The Design Consultants have all met their planned delivery dates. The previous efforts to get early work packages (EWP1 and EWP2) started has paid off in that a good deal of site work is already underway despite the delays in approvals at TWDB and the rain days experienced on site in June and July.

However, TWDB's approval of work packages has been slow. Work contained in Early Works Package 1 was not approved by TWDB until April 21st. Some portions of work in Early Works Package 2 was finally approved on June 10th, leaving some portions still un-approved. Initially, individual bid packages within the Early Works packages were being reviewed and assessed as if each sub-contract package was a separate project requiring independent review, duplication of all front-end documents and environmental clearances.

Seeking to maintain the project schedule, Staff provided NTPs to the CMAR for portions of these packages as soon as TWDB approvals came in. As a result, portions of field work were able to proceed but, progress has suffered from these delays due to TWDB's slow approval procedures and their lack of complete understanding of the CMAR process. TWDB is in the process of creating their review/approval processes for this alternative delivery methodology. The combination of lack of understanding and absences of existing procedures is at the heart of these delays. The project Team met with TWDB in early June and presented an informational package containing an in-depth discussion on the CMAR process as described in Title 10: Chapter 2269.255 of Government Code. This discussion focused on the commercial aspects of the sub-contractor bidding process, the development of sub-contract bid packages and offered guidance for the development of TWDB's forthcoming procedures.

Although TWDB's procedures are being created at this time, the delay to the work has cost the project approximately six months in the overall schedule. Schedule recovery discussions with the CMAR indicate that "float" available in the original schedule has now been consumed by the TWDB delays and has pushed construction completion into December 2022 and commissioning of the plant into early 2023 versus a planned completion of mid-year 2022 with full operations and testing complete before December 2022. Timing for final water to the system will be dependent on the project schedule for Plant Commissioning. The exact Commissioning schedule is anticipated to be early first quarter of 2023 but will be refined based upon system components beginning to come on line. Our current Water Model indicates that a delay into early 2023 will not cause an impact on our water system.

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

Rain Days: 18

*This project was procured through the Construction Manager at Risk (CMAR) process. The original base line schedule was projected using the design-bid-build process. The date shown as Bid Start originally referred to Early Works Packages but has been changed now to reflect bidding for the GMP

Next Steps

As the project moves into the Balance of Project (BOP) Construction Phase, engineering contracts will need to be amended to provide engineering services during construction or “Construction Phase Services”. All three Design Consultants will be needed for the Construction Phase, albeit at differing levels of involvement, based on the complexity of earlier design contributions. Additionally, The Owner’s Representative Master Service Agreement contract with Ardurra will require the addition of Task 5 for Construction Phase Services. Construction Phase services were not included in any of the previous Preliminary or Final Design contracts in order to simplify those scope definitions and fee negotiations.

All three Design Consultant Packages will be presented as contract amendments to the existing Final Design Services contracts. All three Contract Amendments will have very similar scopes of services and will be based on an Hourly Not to Exceed billing. Scope of work in all three will contain but may not necessarily be limited to:

- Personnel hours for attending on-site progress meetings as well as virtual meetings during construction and occasional site visits to monitor work progress and quality control.
- All three will contain hours for review of material and product submittals,
 - addressing Requests for Information (RFIs).
 - This work will include hours for sub-consultant involvement where the source of design was vested in third parties contracted to the prime consultant.
- Each proposal will also include hours for project completion and assistance during start up services which will include inspections at substantial and final completion for the major components within their respective packages.
- Hourly fees for the creation of record drawings from the CMAR’s redlined records.
- Each proposal will include hours for additional services as authorized which will cover hours for
 - unforeseen problem resolutions, additional submittal review and approval work,
 - redesign of work to meet constructability issues and
 - additional hours for extended startup and commissioning services if required.

Staff Plan to bring all three proposals; Packages 1, 2 & 3, for Construction Phase services to Council for award at the September 28th meeting.

Package 1, Freese and Nichols’ proposal includes Basic Services in the amount of \$152,215 and Additional Services of \$40,226 for a total of \$192,441

Package 2, CDM/ Smith’s proposal includes Basics Services in the amount of \$1,315,721 and Additional Services of \$603,380 for a total of \$1,919,101.

Package 3, Stantec’s proposal includes Basic Service in the amount of \$688,640 and Additional Services of \$150,810 for a total of \$839,450.

Finally, Staff will bring Task Order #5 for Ardurra Group’s Owner’s Representative contract for Construction Phase Services. This scope of work is based on Hourly, Not to Exceed basis and consists of Basic Services includes hours for continued coordination with TWDB on funding issues and TCEQ for regulatory issues during construction as well as hours for continuing to coordinate between design package consultants,

attending monthly progress meetings, trouble shooting and problem resolution all under the Project Management category. Basic Services total \$1,339,405

Additional Services (also Hourly, Not to Exceed) include site inspection and construction management based on the 27 month construction and start-up schedule, on-call as authorized water system modeling, coordination and responsibility for completing the Operations and Maintenance Manual, performing a feasibility analysis including 3 alternatives for the future development of a plant forebay and engineering support during the 12 month warranty period. Additional Services total 1,785,609. Total for all Owner's Representative Construction Phase services during construction is \$3,125,014

Recommendation

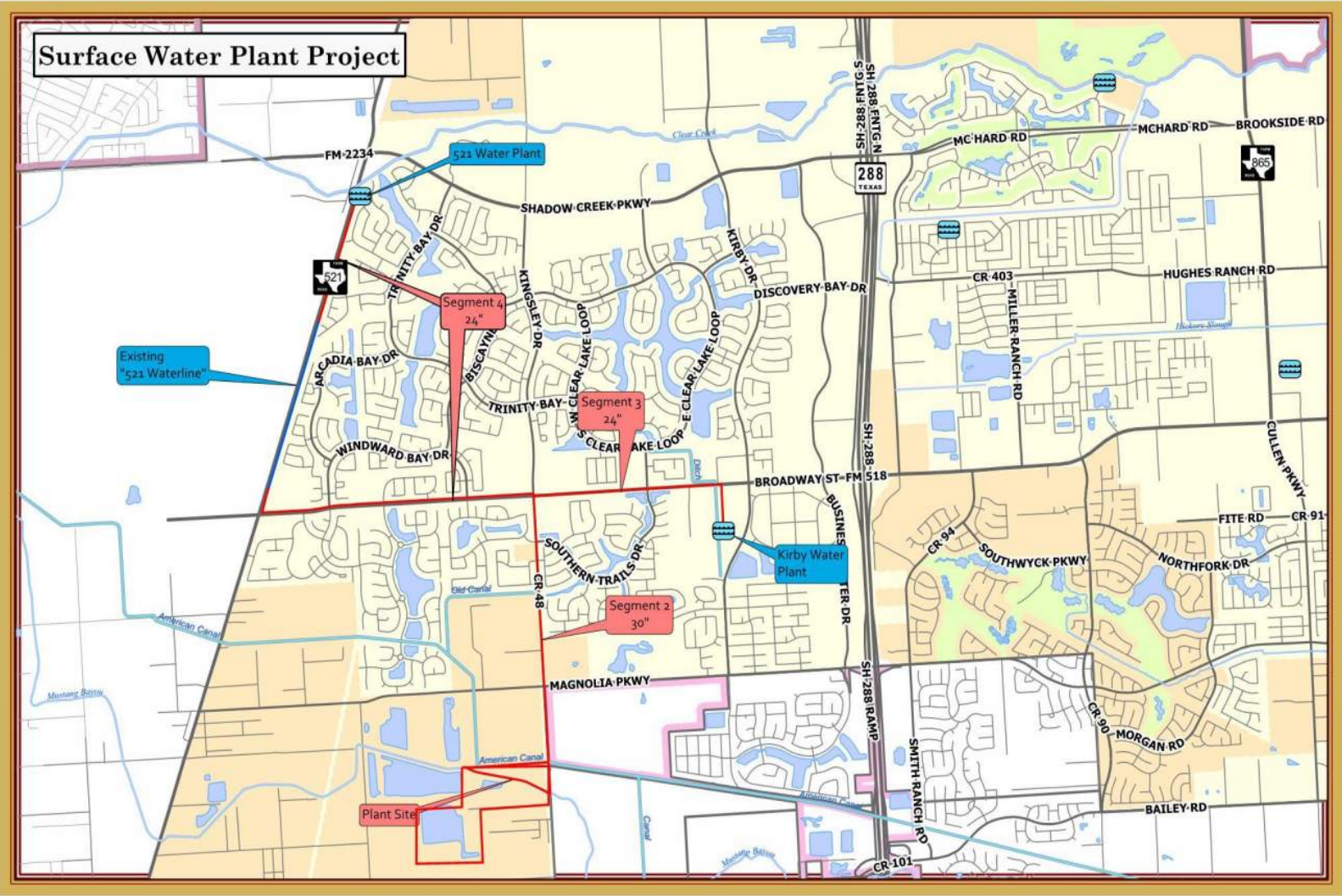
On April 27th Staff will recommend that Council:

- Approve the Guaranteed Maximum Price for the project of \$135,997,681 and Award to Balance of Project Amendment to PLW Waterworks
- Approve amendments to all three Design Package contracts for Construction Phase Services
- Approve the amendment to the Owner's Representative's contract for Construction Phase Services

Previous Memos

6/10/16, 2/2/17, 3/9/17, 4/13/17, 3/29/18, 01/10/19, 08/01/19, 08/08/19, 12/05/19, 1/23/20, 3/05/20, 4/16/20

Map





View from Southeast corner showing GST soil foundation in forefront. Behind and further north in the foundation for the High Service Pump building and west of that is the foundation for the Operations control building.



Mustang Bayou on right and GCWA source water canal on left. Foreground shows foundations for De-Watering and Belt Press Filter building with Sludge Thickeners, and BFP Pump Basin in the center. Further east is the Pre-treatment facility foundation followed immediately by the membrane building foundation. This photo was taken during the heavy rains at the end of July.



This photo shows progression of the deep foundation work on Sludge Gravity Thickeners and the Belt Filter Press Pump Basin. This photo was taken in early August showing preliminary concrete foundations. These components are part of the “deep foundation” work from Early Works Package 2. Note the laid-back walls of excavation to allow the work to be performed without the use of expensive shoring.



This is the same Gravity Sludge Thickeners and BFP Pump Basin approximately two weeks later showing progression of the work. This photo was taken about two weeks later, mid-August showing extensive soil foundation work going in around the preliminary concrete.



This photo was taken at the end of August showing concrete formwork and reinforcing for the concrete floor of the Gravity Sludge Thickener with the Belt Press Pump basin in the background.



This shows the soil foundation for the GST with casting beds for tank wall and roof panels and installation of under-floor drain piping being installed by the tank sub-contractor DN Tanks.



This shot was taken from the west end looking east showing the beginnings of the De-Watering Belt Press Filter building foundation in the foreground with Sludge thickeners towards the center of the site. East of that is the foundation work for Pre-Treatment facility and then the Membrane building. Further east are the foundations for the Operations building and the Maintenance building.