

4/19/2018

To: Mayor and City Council members

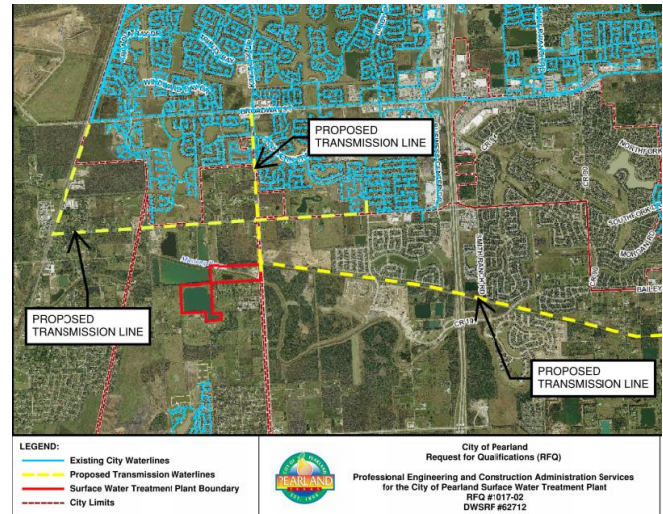
Big public improvement project moving forward with first engineering design/assessments. Clay



Surface Water Plant Phase 1 (10 MGD)

Scope: Pilot testing, design, and construction of a 10 MGD Surface Water Treatment Plant that will treat raw water from the Gulf Coast Water Authority (GCWA) canal for distribution throughout the City's water system. A future phase will include an additional 10 MGD of capacity. The plant will be located on City property on CR48 south of CR59, which is adjacent to the GCWA canal. Pilot testing will begin in FY2017 followed by design and construction. The project is scheduled to be completed over a five year period with new capacity available by 2022/2023. Installation of fiber to serve the City's SCADA system.

Justification: The project will provide additional potable water capacity to meet demands of northern Brazoria County as the region continues to grow. The 2012 Water Model Update based on growth projections established that the demand for an additional 10 MGD would need to be met by 2022/2023.



Project Manager: Skipper Jones

Designers:

Package 1, Raw Water Intake, Pre-Sedimentation Basin and Low Lift Pump Station & transfer piping – Freese & Nichols

Package 2, Water Plant: PAC Contactor, Plate Settlers, Sludge De-Watering, Membranes, GAC Contactors, Chlorine Facility and Break Tank/ Transfer Pumps – CDM Smith

Package 3, Consists of preliminary design of the Ground Storage tanks, High Lift pump Station, Transmission lines, Wastewater Force Main, and Waterline Easement Acquisition – Stantec

Schedule Info:

	Base Line	Current
Design Start - Package 1	March-17	May-17
Design Start - Package 2	March-17	May-17
Design Start - Package 3	March-17	April-18
Bid Start	March-20	
Construction Start	May-20	
Proposed Construction Completion	December-22	

Budget Info:

Revenues	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	Future		68,625,000	68,625,000
Impact Fee - Debt	Future		68,625,000	68,625,000
W/S Revenue Bonds				-
Impact Fee - Debt				-
Cash				-
Other Funding Sources				-
Total Revenues		12,025,000	137,250,000	149,275,000
Expenditures		To Date	Future	Total
PER		9,327,358		9,327,358
Land			900,000	900,000
Design		2,395	16,600,000	16,602,395
Construction Contract			125,000,000	125,000,000
Construction Management/Inspection				-
Construction Materials Testing				-
FF&E				-
Total Expenditures		9,329,753	142,500,000	151,829,753
Project Balance/Contingency				(2,554,753)

Current construction cost estimates are based on draft PERs which are under review.

Highlights:

- **Package 1**, Consists of the preliminary design of the Raw Water Intake structure and intake piping, the Pre-Sedimentation Basin, the Low Lift Pump Station and the two plant supply pipes from the pump station to the plant along with electrical requirement and control instrumentation.
 - Preliminary Survey and Geotechnical work is complete
 - Preliminary assessment of the basin’s physical and operational capacities is complete
 - Draft PER was submitted in mid-March containing the following recommendations:
 - Raw Water intake and transfer piping includes the intake structure on the American Canal, two 36 inch gravity intake pipes through the Mustang Bayou siphon to a distribution system surrounding the basin
 - Low Lift Pump Station includes initial pumping for 10 MGD (11MGD Actual) and planning for 20 MGD (22MGD actual) pump capacities using submersible pumps operating behind five gated intake screens, the electrical room, generator room and pump room with hoist for pump maintenance.
 - Preliminary designs for the Raw Water Pump Station capacities for initial 10 MGD and future 20 MGD requirements are complete.

- Three basin construction scenarios were modeled to maximize storage capacity and counter ground water pressures acting on the basin floor. The recommended option provided a maximum 37 day drawdown at the 10 MGD water production rate but increased the cost to construct the basin.
 - A preliminary opinion of probable construction costs is still under development based on Staff selection of construction alternatives and basin capacities.
- **Package 2**, Consists of preliminary design efforts for the major components of the Plant, including: Powder Activated Carbon (PAC) Pre-Treatment, Plate Settlers, Sludge De-Watering, Membranes, Granular Activated Carbon (GAC) post-treatment contactors, Chlorine Facility and Break Tank/ Transfer Pumps and the design, construction and operation of the Pilot Plant.
 - PER is composed of multiple technical memoranda (TM) as detailed below. Overall the process is progressing well and is now approximately 45% complete.
 - Initial site survey is complete, additional survey was requested for the south side of Mustang Bayou for detention purposes and will complete this month.
 - Alternative Processes TM second Draft and Summary were submitted in late August and are under review.
 - Bench Scale process testing has now completed 4 phases of testing to identify the most effective and efficient processes.
 - Package Coordination: a second coordination meeting was held with Freese and Nichols (Pkg 1 designers) last June to review alternatives and decisions.
 - Site Master planning is progressing with major process facilities now laid out on the site and coordinated with Package 1 processes as well as probably Package 3 facilities. Environmental permitting is underway and coordination with Brazoria Drainage District 4 is on-going.
 - SCADA Architecture development is underway in coordination with process controls for wastewater plants. A TM was submitted in March for review.
 - Electrical Power Assessment and Evaluation has begun and is in coordination with Centerpoint Electric. Initial findings were reviewed in the March 22 progress meeting.
 - Plant Security and Process Surveillance development is underway and a TM was submitted to the Owner's Rep' for review and comment.
 - Individual Unit Process evaluations are underway beginning with chlorination; membrane operations, dewatering, Granular Activated Carbon (GAC) contactor, the transfer pump station and the Powder Activated Carbon (PAC) contactor
 - Architectural preliminary design is underway with two reviews of the operations building having been completed. This work includes HVAC, Electrical and Plumbing preliminary design
 - Preliminary Process Instrumentation and Control (P&ID) work has begun and is running in concurrence with process development.
 - Pilot Testing
 - Three membrane manufacturers were selected late last year to provide scaled membrane pilot units. Bench scale testing provided protocols for test processes that will be run in these units.

- Pilot process building was completed in early March and equipment moved in. Piloting in all three units has begun and will continue for approximately nine months to produce complete process procedures and identify most effective/ efficient membrane along with process nuances for final incorporation into plant equipment, processes and piping.
- **Package 3**, Consists of preliminary design of the Ground Storage tanks, High Lift pump Station, Transmission lines, Wastewater Force Main, and Waterline Easement Acquisition
 - PER Contract was awarded April 9
 - NTP issued April 10

Previous Memos: 6/10/16, 2/2/17, 3/9/17, 4/13/17, 3/29/18

SURFACE WATER TREATMENT PLANT

