

11/8/2018

To: Mayor and City Council members

Upcoming engineering design contract to address water quality issues at the Bailey and Magnolia water wells with permanent solutions and replace the ground storage tank at the Bailey plant. -Trent

Memo



To: Clay Pearson, City Manager

From: Mahagony Isabell, Project Manger

CC: Trent Epperson, Assistant City Manager
Robert Upton, P.E, Engineering Director
Clarence Wittwer, Director of Public Works
Skipper Jones, Assistant Director, Capital Projects

Date: November 5, 2018

Re: Bailey Water Plant Improvements

Purpose:

This memo provides pre-award notice of **proposed engineering services contract for the Bailey Road Water Plant improvements** and background information on the project itself.

Project Background:

The **Bailey Road water plant** is located along the north side of Bailey Road and at the west foot of the railroad overpass. This site contains a 1,800 gallons per minute (gpm) well, a single 1 million gallon (MG) ground storage tank (GST), a 1MG elevated storage tank (EST), chemical feed pumps and tanks, and 3 booster pumps.

The well and site was constructed in 2005 and has a history of high iron and manganese level that have been the focus of long running complaints particularly during the winter months when water use decreases. The plant was taken out of service in April 2014 due to these complaints and was being placed back in service in late January this year when the damage to the ground storage tank was sustained. Elevated levels of manganese and iron are non-regulated secondary constituents, while not dangerous to the public, can cause taste, odor, and appearance complaints.

Water Production Staff have historically used polyphosphates and zinc orthophosphates to keep the iron and manganese in solution, referred to as "sequestering" these materials but, this has a limited effective life of 48 to 72 hours and during low use periods, typically in the winter months, these materials drop out of solution and show up as "dirty water" "brown water" and "rusty water" complaints.

Efforts to flush the distribution system to push this hours old water out resulted in complaints of low water pressure in the distribution system service area. Once flushing was completed pressure returns to normal but, then new complaints arrive regarding water taste, odor and color again.

A study was performed by HDR Engineering in late 2011 that reviewed three treatment alternatives but focused specifically on the use of a "Green Sand" filter which uses manganous sulfate and potassium permanganate to chemically bind the iron and manganese and remove it from the water. The backside of this process requires backwashing the sand and removal of the filtrate to a sanitary sewer for disposal.

The **Magnolia Road well**, located almost due north of the Bailey Road facility, **has a recent history of containing dissolved hydrogen sulfide gas** which produces a mild rotten egg smell and can contribute to taste and odor issues. Once this development was discovered the well was turned off and is not in service until further evaluation can be conducted with this project and potential incorporation into the Bailey Water Plant improvements.

These scenarios highlight the need to provide additional treatment technology at the sites to remove the offending constituents prior to the introduction of this water to the distribution system. Flushing only temporarily addresses the issues and, as noted above; it is a costly means of coping with the problem by wasting precious treated water and does not provide a long-term solution. These wells and their contributions to the total water supply of the City remain a critical component of the overall system capacity and water quality.

The proposed project is planned for two phases; **Phase One will consist of the Engineer performing a one week pilot test of three potential treatment technologies to determine the best methodology for removing iron, manganese and hydrogen sulfide gases economically. Phase Two includes design of the selected treatment method along with other components associated with this treatment solution.** This will include site piping modifications to accommodate the treatment process, the design of a new concrete ground storage tank and other components that could include a possible green sand filter, waste water system to remove the collected solids, an updated chemical feed and pump control building and connecting a raw water main from the Magnolia Well. **The Capital Improvement Program (CIP) has been programmed to build the necessary infrastructure, treatment system and replacement GST to get the wells back on-line.**

Scope of the Contract:

The scope of work proposed for Basic Services includes: Preliminary Engineering and Design phase items including: the pilot testing and evaluation of three potential treatment technologies, full design services for the site, equipment, piping and instrumentation and off-site improvements, coordination with the City's SCADA designer for control and reporting methodologies design of the pump and chemical feed systems and housing and submittals of drawing sand other data to regulatory agencies for approvals. Bid Phase activities include preparation of the bid documents, attendance at the pre-bid conference and answering questions/ preparation of Addenda if required, review of bidders qualification and reputation and preparation of a recommendation to award. Construction Phase activities include: acting as the City's project representative during construction including site visits and observation of the work, providing clarification/ and answering questions pertaining to the plans and specifications, identifying defective work, reviewing submittals and samples, review of potential change order requests and proposed substitutions, rendering decisions in disputes and reviewing applications for payment preparing close out documents including operations and maintenance manuals and as built documents and participating in the substantial completion and final completion processes. Post Construction Phase services includes assisting with the adjusting and testing of equipment to tailor to water quality expectations, completing the one year walk-through and production of the final record drawings

Additional Services include surveying and easement provisions for the off-site waterline or other improvements, development of an operations plan for the facility, and assistance with start up.

Basic Services as proposed for the contract are \$335,200.00 and will be performed on a lump sum not to exceed basis per the provided fee schedule and level of effort. Additional services are

estimated at \$37,260.00 and will be performed on a time and material basis as authorized by the City. The total contract value to encompass the work for design of the Bailey Water Plant is \$372,460.00.

Schedule:

Staff expects to bring the proposal to Council in November for consideration and award. It is anticipated once the contract is approved design will take 20-26 weeks to develop plans and specifications and to submit to TCEQ. Construction after bidding is estimated to take 24-30 weeks.

	<i>Base Line</i>	<i>Current</i>
<i>Design Start</i>	December-18	
<i>Bid Start</i>	August-19	
<i>Construction Start</i>	October-19	
<i>Proposed Construction Completion</i>	July-20	

Budget Info:

Funding Sources	Series	To Date	Future	Total Budget
General Revenue - Cash				-
Certificates of Obligation				-
Certificates of Obligation				-
General Obligation Bonds				-
W/S Revenue Bonds	2018	620,000		620,000
W/S Revenue Bonds			4,240,000	4,240,000
Impact Fee - Debt				-
Other Funding Sources				-
Total Funding Sources		620,000	4,240,000	4,860,000

Expenditures	To Date	Future	Total
PER			-
Land			-
Design		372,460	372,460
Construction		3,600,000	3,600,000
Construction Management/Inspection			-
Construction Materials Testing			-
FF&E			-
Total Expenditures	-	3,972,460	3,972,460

Project Balance/Contingency	887,540
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MAGNOLIA & BAILEY ROAD WATER PLANTS



Legend/Notes

 Water Structure

1:11,000

1 inch = 917 feet



NORTH

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MA P PREPARED: NOVEMBER 8, 2018

