

11/8/2018

To: Mayor and City Council members

Upcoming engineering design contract for final design of the Barry Rose plant expansion and Longwood Regional Lift Station and Force Main. The design will include capacity to complete the decommissioning of the Longwood plant that was inoperable for several days during the Hurricane Harvey event and resiliency measures for the Barry Rose plant that also experienced flooding. -Trent

# Memo



To: Clay Pearson, City Manager

From: Cara Davis, Sr Project Manager – Engineering & Capital Projects

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

Date: November 8, 2018

Re: Barry Rose Wastewater Treatment Plant Expansion

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## Purpose

This memo provides advanced notice of the proposed engineering services contract award for Final Design Services for the City of Pearland Barry Rose Water Reclamation Facility (BRWRF) and the work involved in decommissioning of the Longwood Water Reclamation Facility (LWRF).

## Background

An assessment of the LWRF, performed by Arcadis/ Malcom Pernie in 2010, noted that this plant would need a major rehabilitation and expansion, to continue to comply with Texas Commission on Environmental Quality (TCEQ) requirements, if the City planned to continue to keep the LWRF in operation long-term. The cost of those improvements, due to the condition, require capacity expansion and updated equipment were estimated to exceed \$50 million dollars. The plant's location in the floodplain made this prohibitively expensive and was considered unsustainable. At that time, the decision was made to perform a short term rehab of the existing facilities and **begin planning to incrementally shift flows to the BRWRF and John Hargrove Environmental Complex Water Reclamation Facility (JHECWRF) plants with the ultimate goal to decommission and abandon the LWRF, reducing the number of plants the City maintains and operates.** This plan dovetailed into TCEQ's philosophy of reducing the number of localized wastewater plants and shifting to a more regional plant philosophy.

**The 2012 study, "Wastewater Planning for Longwood Service Area", performed by HDR Engineering, laid out a phased long term plan for routing wastewater flows away from the LWRF to BRWRF and the JHECWRF plants. Several of these smaller projects have been completed over the last five years to include an oversize agreement with the Riverstone Ranch development, Longwood Service Area - Phase II and Green Tee to Riverstone. Hurricane Harvey in August of 2017 totally inundated the plant shutting it down for multiple days and convincingly demonstrated the need to complete the plan for decommissioning and abandoning the LWRF.**

**The BRWRF Preliminary Engineering Report (PER) for the expansions of the plant, performed by Stantec Consulting Services Inc. (Stantec) (formerly MWH America) and completed in February 2018, focused on quantifying increased flows from both existing BRWRF and LWRF service area**

basins commensurate with population growth on the east side (See attachment from PER Appendix E, Figure 5 showing both service areas and future land use/ development). The PER specifically estimated the increased plant capacity required at BRWRF to accommodate these flows and abandon the LWRF by transferring flows via a new regional lift station and force main to the BRWRF. Flows to BRWRF currently stand at 60-65% of the current plant capacity of 3.10 million gallons per day (MGD), or 1.57 MGD. Flows to LWRF, which will be decommissioned and rerouted to BRWRF, currently average 2.08 MGD. As per TCEQ a combined frequency analysis was developed for the two wastewater treatment plants resulting in an annual average daily flow of 4.17 MGD. Based on existing data of the two plants a combined characterization of flows and loads took place and peaking factors were then calculated. **Applying the calculated peaking factors to the projected flows and considering growth within the combined basins the projected build-out capacity required is 8.53 MGD representing a capacity expansion of approximately 5.5 MGD.**

**Hurricane Harvey also impacted the BRWRF with flood waters of 18-24 inches above grade.** Although this event did not shut down the Barry Rose plant it did impact operations and cause damages to equipment indicating a vulnerability to extreme events. A site assessment was performed by Stantec after the storm which developed a damage assessment report. **The final design for treatment systems at Barry Rose will ensure due diligence is performed to make sure that the mechanical and electrical equipment will be raised above the historic flood water elevation.** The City of Pearland Flood Hazard Prevention Ordinance requires facilities to be located a minimum of 1-foot above the 100-yr floodplain elevation but it will be recommended that the critical processes and top of concrete structures be located 3-feet above the 100-year flood plain in the event of another Harvey-like hurricane/storm event.

TCEQ requires that planning for plant expansion begin when flows reach 75% of plant rated capacity and construction begin when flows reach 90% of capacity. **To ensure we have the design completed and are able to complete construction ahead of the need for additional capacity, it is necessary to begin the final design work for the expansion of BRWRF and the creation of a Longwood Regional Lift Station and Force Main.,**

To meet Texas Water Development Board (TWDB) requirements for state funding, staff issued an RFQ for Professional Engineering and Construction Phase Services for this project which closed in June 2018. Stantec was the only qualified firm which submitted for the BRWRF project. They were brought in for an interview and, based upon their plant familiarity and similar project experience, were selected as the most qualified firm to perform Final Design phase services for the expansion of the BRWRF and the design for the regional lift station and force main that will eventually replace the unsustainable LWRF.

### **Scope of the Contract**

Completion of the BRWRF and decommissioning of the LWRF has been separated into three phases:

Phase 1 – Preliminary Engineering Services (Complete)

## Phase 2 – Final Design Services (Currently Presented for Consideration)

Phase 3 – Construction Management and Start-Up Support Services (Future)

The scope of the proposed work in Phase 2 will include Project Management, Basis of Design development, Final Design, TCEQ Permitting and Additional Services to prepare one construction contract package including drawings and specifications for the BRWRF treatment plant work and another package for the LWRF lift station and force main work. Stantec will provide support services through the bidding phase up to providing the Letter of Recommendation to Council under this contract. Additional Services to be provided on an as approved basis include: structural inspections of existing infrastructure; right of way and easement identification for the force main; real estate and easement acquisition; grant and loan application assistance services; TWDB Funding NEPA Compliance permitting; Corps Permitting if required and/or other services as agreed to by the City.

Basic Services as proposed for the contract are \$4,937,106.00 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 \$175,260.00 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 BRWRF and decommissioning of the LWRF is \$5,112,366.00.

### Schedule

Staff expects to bring this proposal to Council in November for consideration and award. The proposal includes a high level “milestone” schedule for each of the tasks involved. That schedule includes approximately 21 months of work to complete all of the tasks and finalize the design. Staff would anticipate moving directly into the bid/award phase scheduled for approximately three months. This places bidding and construction activities toward the latter months of 2020 with construction starting in early 2021. Construction of the expansion is projected to require 24 months. During the design, staff and the consultant will also explore the option of alternative delivery methods for construction, such as Construction Manager at Risk.

	<b>Base Line</b>	<b>Current</b>
<b>Design Start</b>	September-18	December-18
<b>Bid Start</b>	September-20	
<b>Construction Start</b>	December-20	
<b>Proposed Construction Completion</b>	December-22	

## Budget Info

Funding Sources	Series	To Date	Future	Total Budget
General Revenue - Cash				-
Certificates of Obligation				-
W/S Revenue Bonds	2017C	400,000		400,000
W/S Revenue Bonds	2018B	2,990,000		2,990,000
W/S Revenue Bonds			27,950,000	27,950,000
Impact Fee - Cash		3,390,000		3,390,000
Impact Fee - Debt			27,950,000	27,950,000
Other Funding Sources - Fund Balance		300,000		300,000
<b>Total Funding Sources</b>		<b>7,080,000</b>	<b>55,900,000</b>	<b>62,980,000</b>

Expenditures	To Date	Future	Total
PER	773,209		773,209
Land			-
Design		5,112,366	5,112,366
Construction		53,300,000	53,300,000
Construction Management/Inspection			-
Construction Materials Testing			-
FF&E			-
<b>Total Expenditures</b>	<b>773,209</b>	<b>58,412,366</b>	<b>59,185,575</b>

<b>Project Balance/Contingency</b>	<b>3,794,425</b>
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# PROJECT LOCATION MAP



### Legend/Notes

 Wastewater Treatment Plant

## Barry Rose Water Reclamation Facility Expansion & Decommissioning of Longwood Water Reclamation Facility

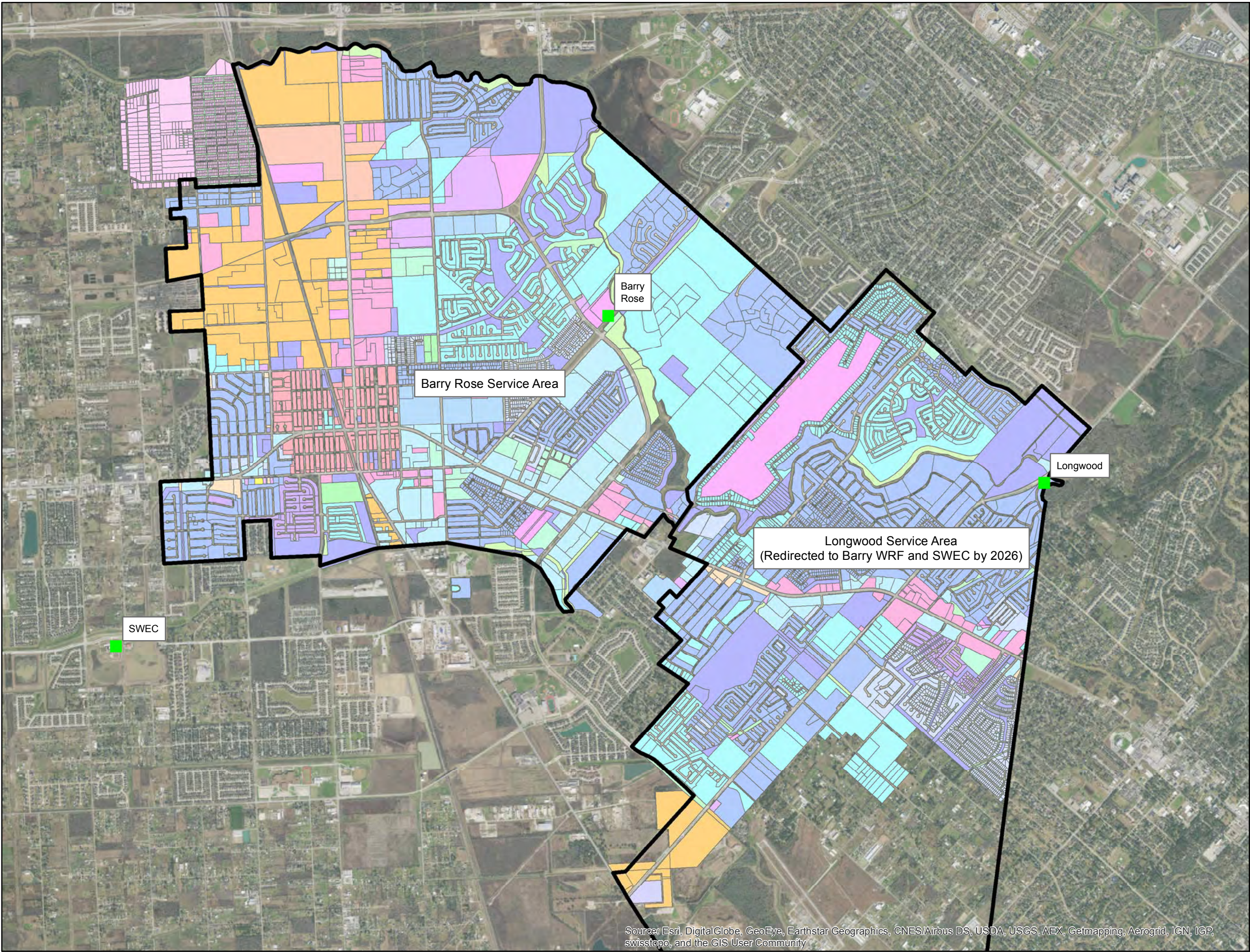


1:25,461  
1 inch = 2,113 feet



**NORTH**  
This product is for informational purposes only and may not be prepared or be suitable for legal, engineering, or surveying purposes.

MA P PREPARED: NOVEMBER 7, 2018



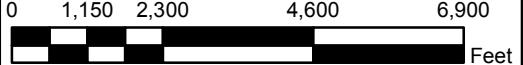
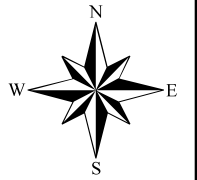
# LEGEND

Service Area Boundary

WRF

## Land Use Type

- CEM
- City
- DFP
- GB
- GC
- M-1
- M-2
- MF
- NS
- OP
- OT
- PISD
- POS
- PSP
- PUD
- R-1
- R-2
- R-3
- R-4
- ROW
- SD-A
- TH



TITLE: Figure 5: Future Land Use Plan for Barry Rose Service Area

PROJECT: Barry Rose Water Reclamation Facility Expansion



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community