Ref: 19-6542

AGENDA

ENGINEERING COMMITTEE MEETING
LEUCADIA WASTEWATER DISTRICT
Tuesday, February 5, 2019 – 9:00 a.m.
1960 La Costa Avenue, Carlsbad, CA 92009

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1. **Call to Order**

2. **Roll Call**

3. **Public Comment**

4. **New Business**
   A. Authorize the General Manager to execute Amendment No. 5 to Task Order No. 29 with Infrastructure Engineering Corporation for additional design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed $47,986. (Pages 2-7)

5. **Information Items**
   A. Keeping our eyes on target (verbal)

6. **Directors' Comments**

7. **General Manager's Comments**

8. **Adjournment**

Ref: 19-6543

MEMORANDUM

DATE: January 30, 2019

TO: Engineering Committee

FROM: Paul J. Bushee, General Manager

SUBJECT: **Leucadia Pump Station Rehabilitation Project – Design Services**

RECOMMENDATION:

Staff requests that the Engineering Committee recommend that the Board of Directors:

1. Authorize the General Manager to execute Amendment No. 5 to Task Order No. 29 with Infrastructure Engineering Corporation for additional design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed $47,986.

2. Discuss and take other action as appropriate.

BACKGROUND:

Tactical Goal: Infrastructure and Technology / Leucadia Pump Station Rehabilitation

In May 2018 the Board authorized Amendment No. 4 to Task Order 29 with Infrastructure Engineering Corporation (IEC) for engineering services for the design of the Leucadia Pump Station (LPS) Rehabilitation Project. The major design criteria for Amendment No. 4 included:

- Install five new dry pit submersible pumps, three of which have 150 horsepower (HP) motors and two with 25 HP motors.
- Replace the check valves and associated piping and place them in the horizontal position from their current vertical position.
- Replace the 24" discharge header which was installed as part of the 1971 construction.

You may recall that this criteria was added to the project design because staff discovered extremely high levels of hydrogen sulfide (H_2S) at the discharge end of the Leucadia (L2) Force Main. High concentrations of H_2S create an extremely dangerous, odorous and corrosive environment. Staff and District Engineer (DE) Wilson evaluated and field tested several operational adjustments to reduce the H_2S level. However, no significant H_2S reduction resulted from the field tests. Therefore, an evaluation and redesign of the mechanical system was required to reduce the H_2S levels. In the interim, staff switched from Bioxide to ferrous chloride to improve H_2S control at a reduced cost. The installation of new pumps, check valves and associated piping altered the original project scope from a minor to a major pump station rehabilitation.

DISCUSSION:

Recently, staff began the evaluation to specify a replacement large capacity emergency bypass pump to replace "Big Blue". Big Blue requires replacement by January 2020 to meet revised San Diego County Air Pollution Control District (APCD) discharge requirements. The FY 2019 Capital Acquisition Budget includes a line item for pump replacement. During the evaluation staff not only considered various configurations for the new pump, but holistic ways to improve emergency bypass pumping. As a result, staff chose to separate the emergency bypass pump into two sections (an electric motor driven pump and an electric generator) and to have a permanently

installed submersible pump in the LPS Emergency Basin. This new arrangement has multiple advantages.

- The ability to rapidly start pumping operations out of the emergency basin in emergencies.
- Reduce the size and capacity of the replacement emergency bypass pump.
- Smaller mobile emergency bypass pump provides increased maneuverability and safety.
- Smaller pump foot print, easier to position in a confined pump station area.
- Pump end can remain connected, if desired, and not violate APCD regulations.

Additionally, staff has continued to evaluate alternate methods for H_2S control. As a result, staff has determined that a super-oxygenation system is the most effective method to lower H_2S levels and reduce operational cost. Therefore, staff requested IEC include installing both a permanent submersible pump in the Emergency Basin and a super-oxygenation system at LPS. The amendment incorporates these concepts into project design.

IEC has submitted a proposal, attached, to continue project design. The Scope of Work includes:

Task 1 – Project Management and Administration

Task 2.1 – Interim Design Submittal
Compare an electric driven submersible pump to a diesel driven at-grade pump for parallel bypass pumping to meet peak flows during construction.

Task 2.2 – Emergency Pumping for LPS
Review permanent submersible pump parameters and complete preliminary design and layout for the Emergency Basin pumping system.

Task 2.3 – Odor Control
Confirm specifications and design site layout for super-oxygenation odor control system.

Task 2.4 – Floodproofing Dry Pit
Evaluate electrical modifications in the LPS dry pit to enable continuous operations of the submersible pumps if flooding occurs in the dry pit.

IEC's proposed fee for the scope of this amendment is $47,986 which includes services to support project design, such as electrical engineering subconsultant design services. The current engineer's opinion of probable construction cost including a 15% contingency is $2,822,000. The total design cost with this amendment is $365,931 or 13% of the estimated construction cost. Staff reviewed the proposal and believes it is fair and reasonable. Therefore, staff recommends that the Board authorize the General Manager to execute Amendment No. 5 to Task Order 29 with IEC for engineering design services for the Leucadia Pump Station Rehabilitation Project.

FISCAL IMPACT:

The FY 2019 budget contains sufficient funds to continue design services to be provided under this task order amendment.

rym:PJB

Attachment

January 25, 2019

Mr. Robin Morishita
Leucadia Wastewater District
1960 La Costa Avenue
Carlsbad, California 92009

RE: Proposal for Additional Engineering Services for Final Design of Leucadia Pump Station Rehabilitation Project – Amendment No. 5 – Interim Design Submittal, Permanent Submersible Emergency Pumping at LPS, Odor Control and Floodproofing

Dear Mr. Morishita:

It has been our pleasure to assist the District with the Leucadia Pump Station (LPS) Rehabilitation Design Project. This letter requests an amendment (Amendment No. 5) for additional engineering services to prepare an interim design submittal and to prepare a preliminary design for submersible pumping in the emergency overflow basin with related electrical preliminary engineering for a super-oxygenation odor control system for use at the pump station and flood proofing of the dry pit.

Interim Design Submittal

On July 20, 2018 IEC submitted 75% design plans and specifications based on the Preliminary Design Report. In response to comments made in the 75% Design Review Memo and design review meeting, the District has requested that IEC prepare an interim submittal based on changes to the scope of the design parameters of the PDR. These changes include the use of submersible pumps for bypass pumping, a decrease in discharge header diameter, a request for evaluation of all pump station pipe sizing and check valve and flow meter sizing. IEC completed and delivered the Interim Design Submittal to the District on October 16, 2018. The interim submittal was discussed at a review meeting held on November 7, 2018, at which the additional topics of emergency/bypass pumping and odor control were raised.

Emergency Pumping Preliminary Design

IEC will develop a preliminary design for use of a permanent submersible pump for pumping from the emergency overflow basin. The preliminary engineering will include pump selection, pump layout and discharge manifold piping and valve layout. We will design the discharge header to connect to the existing force main bypass connection and also to allow for a second pump connection. A duty point of 3200 gallons per minute (gpm) at 120 feet (ft,') of Total Dynamic Head (TDH) has been selected by the District Engineer. IEC will confirm this selection with the District Engineer prior to pump selection. We will consider the District's goals to power the submersible pump using a new exterior watertight Motor Control Center with soft start and control panel, to power from a portable generator and lastly, to power from the existing generator at the LPS. IEC will evaluate siting for a new valve package to control flow from the proposed submersible pump in the emergency wet well to the existing force main system.

Odor Control

The District is currently using ferrous chloride to control hydrogen sulfide production in the LPS force main (L1). The District proposes to discontinue chemical addition for sulfide control and instead use a super-oxygenation system from ECO2 or Blue Green. The super-oxygenation system would require on-site oxygen generation or storage of liquid oxygen (LOX). The District has requested that IEC review the requirements of the super-oxygenation system for incorporation into the LPS Rehabilitation Design project.

Floodproofing the Dry Pit

The IEC team, including electrical subconsultant Moraes Pham, will evaluate and redesign the electrical disconnect box and safety switches at each of the pumps for water-tightness. The height of electrical connection boxes will be raised to a "floodproof" level above the floor. The dry pit submersible pump cable connection to the electrical connection box and entry into the pump will be confirmed to be waterproof.

Summary

This letter requests reimbursement for the additional engineer services required to prepare the Interim Design Submittal and additional engineering services to prepare a Preliminary Design to evaluate the new topic of emergency pump and odor for inclusion into the LPS Rehabilitation Project design. The services requested under this fifth amendment supplement, and do not overlap with, previous services authorized.

SCOPE OF SERVICES

Task 1.0 – Project Management and Administration

This phase of work will include three Project Coordination and Status Meetings (3), Project Administration, Coordination and Record Keeping and review, update and response to the Interim Submittal Review Comment Log.

Task 2.1 - Interim Design Submittal

The interim submittal will include a comparison of electric driven submersible pump using existing pump station electrical versus diesel driven at grade pumps for bypass pumping during construction. IEC will calculate the velocity and headloss through the discharge header piping, all other station piping, the check valve and flow meter and include the results of these calculations in the interim submittal. The line velocity through the check valve will also be evaluated to determine whether it is sufficiently high to keep the valve open during low flow. IEC will prepare a technical memorandum and mechanical plan and section drawings for the interim submittal

Task 2.2 – Emergency Pumping for LPS

IEC will prepare a Preliminary Engineering Report for Emergency Pumping with a permanent submersible pump in the emergency overflow basin for the LPS. We review the duty point for the

submersible with the District Engineer, select the pump size and type, layout and preliminary design. A preliminary electrical will be done and an Engineer's Opinion of Probable Cost prepared. A review meeting will be held to solicit input from District Engineering and Field Staff. Once the preliminary design concept is agreed to, IEC will outline implementation steps. A draft and final technical memorandum will be prepared for this task.

Task 2.3 – Odor Control

Confirm the design criteria for the super0-oxygenation system – sulfide loading and removal
Layout ECO2 or Blue Green equipment including storage tank or generation equipment
Define site modification required for safety and security (asphalt, etc.)
Prepare Engineer's Opinion of Probable Construction Cost
The findings of this task will be included in the technical memorandum under Task 2.2.

Task 2.4 – Floodproofing Dry Pit

Confirmation of dry pit submersible design for submergence – cable entry, etc.
Coordination with electrical modifications
Layout of modified equipment configuration (2)
Prepare Engineer's Opinion of Probable Construction Cost
The findings of this task will be included in the technical memorandum under Task 2.2.

SCHEDULE

It is anticipated IEC will commence with preparation of the preliminary design submittal for Task 2.2 through 2.4 within two weeks of the notice to proceed. The prepare of the Interim Design Submittal is already complete. Monies from the LPS final design task (Amendment No. 4) were used to complete it. The preliminary design submittal will be completed within twelve weeks. Additional drafts or a change in scope from the scope prosed here will result in addition time and budget.

FEE

The proposed level of effort and fee is indicated on the attached table. We estimate the cost of the additional work to be $47,986. This would bring the total requested project budget to $365,931. Billing will be in accordance with our current agreement for as-needed engineering services. We sincerely appreciate the opportunity to provide this proposal and assist the District with this project. Please contact me at (858) 842-4425 should you have any questions or need further information.

Sincerely,

Jane Costello

Jane Costello, PE
Project Manager

cc: Jamie Fagnant, PE, IEC, Rob Weber, PE, IEC

FEE ESTIMATE
LEUCADIA WASTEWATER DISTRICT
Leucadia Pump Station Rehabilitation Project
Amendment No. 5
Preliminary Design of Emergency Pumping, Odor Control and Floodproofing

Task/ Subtask	Task/Subtask Description	*Project Manager (Jane Costello)*	*Sr. Project Engineer (Jamie Fagnant)*	*Sr. Project Manager/QC (Rick Kennedy)*	*Engineer II (Anthony Salvoni)*	*Engineer II/CAD Designer II (Tarry Sweltzer)*	*Word Processor (Annette Moore)*	Subtask Labor-Hours	Subtask Labor Cost	Direct Cost	Subcontract (Electrical/Structual)	Total Cost
		$180.00	$160.00	$200.00	$120.00	$120.00	$98.00					
TASK 1.0	Project Management and Administration											$8,076
	Interim Submittal Review Comment Log Review	2			2		2	6	$796			$796
	Project Administation, Coordination, Record Keeping and QC	4		16				20	$3,920			$3,920
	Project Coordination and Status Meetings - (3 total)	9	9					18	$3,060	$300		$3,360
TASK 2.1	Interim Design Submittal											$15,640
	Bypass Pumping Method Comparison	16	2					18	$3,200			$3,200
	Design calculations for headloss and velocity	12						12	$2,160			$2,160
	Mechanical Plans and Section	2			16	16		34	$4,200			$4,200
	Interim Design Submittal Technical Memo	32	2					34	$6,080			$6,080
TASK 2.1	Emergency Pumping Preliminary Design - LPS											$8,220
	Review duty point and select submersible pump	1	1		4			6	$820			$820
	Prepare layout of submersible pump, piping, valves, valve vault.	2			16			18	$2,280			$2,280
	Prepare layout of electrical equipment	2			4			6	$840			$840
	Prepare control description and operating procedures.	4	2					6	$1,040			$1,040
	Prepare Engineer's Cost of Probable Construction Costs	2			6			8	$1,080			$1,080
	Prepare a draft and final Technical Memorandum	12						12	$2,160			$2,160
TASK 2.2	Odor Control											$3,120
	Layout equipment including LOX storage tank or generation equipment on site				8			8	$960			$960
	Define site modifications required for safety and security	2			8			10	$1,320			$1,320
	Prepare Engineer's Cost of Probable Construction Costs	2			4			6	$840			$840
TASK 2.3	Floodproofing Dry Pit											$1,800
	Confirmation of submerged pump operation				2			2	$240			$240
	Coordination with electrical modifications	2						2	$360			$360
	Layouts of modified equipment configuration	2						2	$360			$360
	Engineer's Opinion of Probable Construction Cost	2			4			6	$840			$840
TASK 2.4	Electrical Preliminary Engineering										$11,130	$11,130
		110	16	16	74	16	2	234				
		$19,800	$2,560	$3,200	$8,880	$1,920	$196		$36,556	$300	$11,130	$47,986

TOTAL NOT-TO-EXCEED FEE: $47,986