

## Final Report

State: TEXAS

Grant Number: E-43

Grant Title: **ENGINEERING ANALYSIS FOR HABITAT IMPROVEMENT AT  
PHANTOM LAKE SPRING, JEFF DAVIS COUNTY, TEXAS**

Reporting Period: from 12/01/2002 through 11/30/2003

Objective: To develop an engineering plan including specific recommendations to modify and enhance aquatic habitat for species at risk at Phantom Lake Springs, Texas.

### Segment Objective(s):

1. Evaluate the current situation at Phantom Lake Spring pool from an engineering prospect with the goal of increasing suitable habitat availability for the species at risk.
2. Conduct a complete survey of the site to prepare an elevation model extending from inside Phantom Cave to the downstream extent of the Phantom Lake area with a focus on the spring pool area.
3. Provide specific recommendation, including engineering designs and specifications and cost estimates, for physical modifications in the spring pool area and improvements to the emergency pumping system.
4. Draft reports should be provided to the Wildlife Diversity Branch, Service's Austin Field Office and Reclamation's Albuquerque Area Office for review.
5. Final report and supporting documents should be completed within 30 days of receipt of comments on the draft report.

### Accomplishments:

Segment Objectives 1, 2, 3, and 4 were accomplished (See enclosed plan for Phantom Lake Springs Habitat Enhancement). Cost to accomplish the plan is estimated at \$. The U. S. Bureau of Reclamation has already purchased a generator and switch. A stop-log frame and pumps are also on site. To carry out the provisions of the plan, funding under another grant award is needed.

### Significant Deviations:

This project has experienced delays due to management changes at Texas Parks and Wildlife Department. Oversight assignment of the project was lost with these changes and not picked up until the end of the grant period. A 30-day extension of the grant period was requested and approved to allow completion of the plan and Segment Objective 5 (Reporting).

Cost: \$4,180.00 (TOTAL)

Prepared & Approved by: \_\_\_\_\_ Date: 03/29/2004

Neil E. Carter  
Federal Aid Coordinator

**KLEINFELDER**

An employee owned company

**FAX COVER SHEET**To: Jim Burton

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Texas Parks and Wildlife

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Original Will Follow: ☐Original Will Not Follow: ☐Date: April 15, 2004Total Pages (including cover sheet): 5Subject:Phantom Lake Springs Cost EstimatesSpecial Instructions:

I have received cost estimates for the work proposed for Phantom Lake Springs. You can use these as you see fit for your internal funding paperwork. Proposed scopes are provided on the attached pages. This is what was sent over to Nathan Allan last week.

Construction Contractor: \$7,000Electrical Components and Installation: \$ 6,000Additional Stop Logs (educated guess): \$2,000Kleinfelder Project Management and oversight: \$6,000

It looks like you could put in \$21,000, but if we could use Bureau money for equipment purchases, that would eliminate \$6,000 of the costs. The electrical cost estimates were gathered by Barry Bennett.

## Phantom Lake Springs

### Construction Activities

Use small coffer dam structure to isolate work area, yet protect fish during construction activities

Prepare walls and floor of cave mouth opening for the installation of the concrete wall

Construct 12-foot wide reinforced concrete wall to hold provided stop-log frame structure

Pour 6' x 6' x 4" reinforced concrete pad for backup generator

Place 4-foot by 10-foot portable building for electrical components

Add earthen embankment with liner to downstream end of the habitat area

Remove existing sandbag berm

### Electrical Activities

Install two-pump system and wire to controller box (pumps and controllers provided)

Install pump controls on stop-log wall and wire to controller box

Hook up new electrical components to existing power pole and supply

Install and hook up electrical equipment in portable building

### Plumbing Activities

Install pump system in cave water source

Plumb PVC conduits to hold control wires from level controls and pumps

Plumb HDPE pipes to transfer water from cave to downstream area of habitat

### Other notes:

Generator company will send their representative for installation

Local propane company will install tank and feed line to generator

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West Texas Contractors

(512) 336-6855

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## West Texas Contractors

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### Estimate

Phantom Lake Springs

March 8, 2004

#### Construction Activity

Use small coffer dam structure to isolate work area, yet protect fish during construction activities.

Total \$275.00

Prepare walls and floor of cave mouth opening for the installation of the concrete wall.

Total \$715.00

Construct 12-foot wide reinforced concrete wall to hold provided stop-log frame structure.

Total \$495.00

Pour 6' X 6' X 4" reinforced concrete pad for backup generator.

Total \$457.60

Place 4-foot by 10-foot portable building for electrical components.

Total \$660.00

Add earthen embankment with liner to downstream end of the habitat area.

Total \$2,035.00

Remove existing sandbag berm.

Total \$275.00

#### Electrical Activities (excluded)

4912.60

#### Plumbing Activities

Install pump system in cave water source.

Total \$345.00

Plumb PVC conduits to hold control wires from level controls and pumps.

Total \$275.00

Plumb HDPE pipes to transfer water from cave to downstream area of habitat.

Total \$470.00

1090.00

PHANTOM LAKE - Spring water Pumping System Project No. TA#02.20						INSTALL	INSTALLATION	
ITEM	QTY.	UNITS	EQUIPMENT DESCRIPTION	UNIT \$	EXTENSION	LABOR HOURS	LABOR RATE COST/HOUR	EXTENSION
1			<b>Pump and Liquid Level Connections:</b>					
			Connect two pump feeders to submersible pumps in Phantom Cave.					
2	each		250 feet submersible pump cable #12 AWG. with ground. Service Wire Co. 12-2YG6 #77247 A.	\$ 29/ft.	\$72.50	4 hrs.	15.00/hr	\$60.00
125	feet		1-1/2" PVC Conduit for Pump Feeder Cables	\$ 35/ft.	\$43.75	8 hrs.	\$8.00/hr.	\$64.00
1	job		PVC elbow, threaded fittings, cement, etc.	lump	\$85.00	4 hrs.	\$8.00/hr.	\$32.00
125	feet		Trenching 6" X 24" depth using Ditch Witch 60" diameter rotary saw trencher, 1 operator/ trailer	\$15.50/ft.	\$387.50	n/a	n/a	
100	feet		1-1/2" PVC Conduit for Liquid Level Cables 4#14 AWG (Sensors) & 2#12 AWG (heater).	\$ 35/ft.	\$43.75	8 hrs.	\$8.00/hr.	\$64.00
1	job		PVC elbow, threaded fittings, cement, etc.	lump	\$85.00	4 hrs.	\$8.00/hr.	\$32.00
1	job		Liquid Levels Trenching 6" X 24" depth in same trench with submersible pump cables/conduits.	incl.		4 hrs.	\$8.00/hr.	\$32.00
1	job		B/W Liquid Levels Controls Cat. No. 8012-IFR-3-Type A 818SS-1-1-38 (B/W Ice-Free electrodes)	1 unit	\$1,000.00	8 hrs.	\$15.00/hr.	\$120.00
			Mounting, final connections and adjustment. (Include a B/W Cat. No. 1500-G Relay for Panel.)					
2			<b>Duplex Pump Controller</b>					
1	each		Duplex NonClog Pump System F.E. Meyers includes two(2) 1/2 h.p. pumps, 80 gpm., 10 ft. head					
			includes duplex control panel, NEMA 4X Enclosure, Alternator, Time Meters, Run Lights, timer, etc.					
			Freight to Location Included. (Include a B/W Cat. No. 1500-G Relay for Panel.)					
			Supplier: Triple D Pump, Waco Texas See Quotation Dated 5/29/2003	incl. Pumps	incl. Pumps	8 hrs.	\$15.00/hr.	\$90.00
3			<b>Prefabricated Metal Building on Skids.</b>					
1	each		Size: 8'0" wide X 8'0" length X 7'0" height, corrugated galvanized steel or aluminum siding.	\$1,068.00	\$1,068.00			
			w/ One Door, w/o Windows, No Insulation, Preassembled. (Delivery and Setup Extra)	\$100.00	\$100.00	100 miles	\$ .30/ mile	\$130.00
			Install on site exhaust fan, lighting, electrical service and panels.					
			Supplier: Morgan Buildings, Midland Texas, Telephone Quotation Dated 4/2/2004.					
4	each		Ground Anchors, strapping and brackets.	\$18.50	\$74.00	2 hrs.	\$8.00/ hour	\$16.00
2	each		3/4" X 4'0" X 8'0" AC Plywood Sheets, Installed for Electrical Equipment Mounting Backboards	\$22.00	\$44.00	1 hr.	\$8.00/hr.	\$8.00
4			<b>Pump Bldg. Electrical Service, Panel and Branch Circuit Breakers, Lighting, Recpts.</b>					
1	each		General Electric Loadcenter Cat. No. TLM812SCUDG, rated 125 Amps, 250 VAC, 8/16 spaces	\$165.00	\$165.00	4 hrs.	\$15.00/hr.	\$60.00
4	each		General Electric Circuit Breaker 1 pole, 20 Amp., 125 VAC, Cat. No. THQP120	\$20.25	\$81.00	n/a		
2	each		General Electric Circuit Breaker 2 pole, 20 Amp., 125 VAC, Cat. No. THQP220	\$46.00	\$92.00	n/a		
1	each		General Electric Fused Safety Switch, NEMA 3R, 100 Amp., 120/240 VAC., 3-Wire, 2-Fuses	\$180.00	\$180.00	2 hrs.	\$15.00/hr.	\$30.00
2	each		Bussmann Fuses, Type Fusetron, Dual Element, 250 VAC, Class RK5, 100 amps #FRNR100	\$13.50	\$27.00	n/a		
18	feet		Electric Service Feeder 3#2 copper THWN w/ 1#8 gnd. in 1-1/2" conduit, 5/8" X 8" ground rod.	\$67.50	\$67.50	8 hrs.	\$15.00/hr.	\$120.00
2	each		Appleton V51 Cast Alum. Fixt. lamp guard, 100 watt lamps, galv. 4" oct. box, switch w/ single box	\$95.00	\$190.00	2 hrs.	\$15.00/hr.	\$30.00

2	each	Leviton 2 duplex receptacles, 1 light switch, 3 single-gang boxes, faceplate,	\$22.50	\$45.00	2 hrs.	\$15.00/hr.	\$30.00
		2#12 AWG. with ground in 3/4" EMT conduit, straps, mounting, bends.	\$45.00	\$45.00	3 hrs.	\$15.00/hr.	\$45.00
5		<b>Standby Generator, LPG Fuel/ Automatic Transfer Switch</b>					
1	each	Onan Model RS12000 Home Standby System rated 60 Hz, 11-12 KW, 240 VAC					
		Onan Cat. No. 12GHAB/101 LP Vapor, 120/240 Voltage, 12 kW, with environmental cover/base					
1	each	Onan ATS (Automatic Transfer Switch) Model No. RST 60/178, rated 60 Amps., 120/240VAC	Incl. Gen.	Incl. Gen.	4 hrs.	\$15.00/hr.	\$60.00
		Supplier: Onan/Cummins Power Generators, Minneapolis, Minnesota					
1	job	Concrete Foundation, 4'0" X 4'0" X 6" thickness with 12" grade beams surround.					
		Steel 6X6X#10 WWM, formwork, and site mixed concrete, finishing.	\$125.00	\$125.00	8 hrs.	\$5.50/hr.	\$44.00
6		<b>Liquefied Petroleum Gas (LP Vapor) Propane Tanks</b>					
1	each	500 gallon steel tank, polyline piping, copper fittings, valve regulator, block, connections.	\$1,116.89	\$1,116.89			
1	job	Labor to install including, trenching, backfill, connections, testing, generator final connections.			5 hrs.	\$90.00/hr.	\$450.00
		Supplier: Sierra Supro Energy Propane, Alpine, Texas PGB Destination					
400	gallons	LPG Propane to fill new tank.	\$0.91/ gal.	\$364.00			
		<b>TOTAL EQUIPMENT, ELECTRICAL MATERIALS</b>	<b>TOTAL</b>	<b>\$3,784.39</b>		<b>TOTAL LABOR</b>	<b>\$1,581.00</b>