

1R - 483

# REPORTS

DATE:

6-15-08

RECEIVED  
2008 JUN 23 PM 11 44

June 15, 2008

VIA EMAIL: [wprice@state.nm.us](mailto:wprice@state.nm.us)  
VIA CERTIFIED MAIL

Mr. Wayne Price, Chief  
State of New Mexico – Department of Natural Resources  
Oil Conservation Division – Environmental Bureau  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

**Re: 1R0483 – Elliott B-9 Tank Battery #1, #4 and #5 Remediation Report  
Unit C (NE/4, NW/4), Section 9, Township 22 South, Range 37 East  
Lea County, New Mexico**

Dear Mr. Price:

This report is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of John H. Hendrix Corporation (JHHC) by Larson & Associates, Inc. (LAI), its consultant, to document remediation of historic hydrocarbon contamination at the Elliott B-9 Tank Battery #1, #4 and #5 (Site) located in unit C (NE/4, NW/4), Section 9, Township 22 South, Range 37 East, in Lea County, New Mexico. The soil remediation was a voluntary action performed by JHHC in accordance with a remediation plan approved by the OCD on December 17, 2007. The Site's latitude and longitude is 32° 24' 39.3" north and 103° 10' 12.4" west, respectively. Figure 1 presents a location and topographic map.

#### **Background**

On March 24, 2006, LAI, on behalf of JHHC, submitted an investigation plan to the OCD proposing to collect soil samples at ten (10) locations (BH-11 through BH-20) using an air rotary rig. The investigation plan was approved on March 29, 2006. Scarborough Drilling, Inc. (Scarborough) advanced the borings between 6 and 80 feet below ground surface (bgs) and collected soil samples using split-spoon and jam tube samplers. The split-spoon and jam tube samplers were thoroughly cleaned between uses by washing with a solution of laboratory-grade detergent and water, and rinsed with distilled water. The soil samples were placed in clean glass jars, labeled, preserved in an ice chest and delivered under chain of custody control to Environmental Lab of Texas, Inc. (ELOT) located in Odessa, Texas. ELOT analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) using method 8021B, total petroleum hydrocarbons (TPH), including gasoline range organics (GRO) and diesel range organics (DRO), using method 8015modified and chloride using method 300. The sample results were submitted to the OCD in an investigation report titled, "1R0483, Investigation Report of Historic Contamination and Remediation Plan, John H. Hendrix Corporation, Elliott B-9 Lease, Battery #1, #4 and #5, Unit C (NE/4, NW/4), Section 9, Township 22 South, Range 37 East, Lea County, New Mexico, January 9, 2007". Following its review of the report, the OCD requested JHHC to install a monitoring well in the pit area. During a technical meeting on August 29, 2007, the OCD agreed to installation of the well in close proximity and down gradient (southeast) of the pit. Appendix A presents OCD correspondence.

### **Monitoring Wells and Samples**

On October 16, 2007, Scarborough drilled monitoring well MW-1 approximately 20 feet southeast of the pit. The well was constructed with 2-inch schedule 40 PVC installed in a 5-inch diameter boring that was advanced to approximately 90 feet bgs. Approximately 20 feet of factory slotted well screen (0.010 inch) was placed near the bottom of the boring between about 67.03 to 86.34 feet bgs and surrounded with 10 to 20 graded silica sand. The sand was placed to about 2 feet above the screen and the remainder of the boring was filled with bentonite chips to about 1 foot bgs. The well was secured with a locking cap and locking steel cover anchored in a 3 x 3 foot concrete pad. Groundwater stabilized in the well at approximately 77.99 feet bgs. Table 1 presents a summary of the well drilling and completion details. Figure 2 presents the monitoring well location.

Soil samples were collected at ground surface, 20, 40 and 60 feet bgs using methods previously described and were analyzed by ELOT for TPH and chloride. TPH reported in the 20-foot sample at 48.3 milligrams per kilogram (mg/Kg) and was less than the method detection limit in the remaining samples. Chloride was reported from 21.3 mg/Kg in the 10-foot sample to 53.2 mg/Kg in the 60-foot sample. Groundwater samples were collected from well MW-1 on October 16, 2007, after the well was developed and purged by pumping and hand bailing. The purged water was placed in a portable tank and disposed at an OCD approved facility by Vista Services, Inc. Groundwater samples were collected using a dedicated polyethylene bailer and carefully poured into laboratory prepared containers, which were labeled, chilled in an ice chest and delivered under chain of custody control to DHL Laboratories, Inc. (DHL), located in Round Rock, Texas. DHL analyzed the groundwater samples for major anions and cations (chloride, fluoride, Nitrate as N, sulfate and bicarbonate, carbonate, hydroxide alkalinity), pH, total dissolved solids (TDS), BTEX, and dissolved metals (arsenic, barium, cadmium, chromium, lead, magnesium, mercury, potassium, selenium, silver and sodium). Table 2 presents a summary of the soil sample results. Table 3 presents a summary of the groundwater sample results. Appendix B presents the laboratory reports.

Referring to Table 3, chloride (1,710 mg/L) and TDS (3,300 mg/L) were reported above the New Mexico Water Quality Control Commission (WQCC) domestic water quality standards of 250 milligrams per liter (mg/L) and 1,000 mg/L, respectively. No BTEX was reported in the sample, and dissolved metals were less the WQCC human health standards.

On December 3, 2007, a background monitoring well, MW-2, was installed about 200 feet northwest of the Site. The well was drilled to approximately 91 feet bgs and completed using methods previously discussed. The well screen was placed between approximately 70.50 and 89.81 feet bgs and groundwater stabilized at approximately 78.79 feet bgs. Soil samples were collected during drilling at 0, 20, 40 and 60 feet bgs and were analyzed for chloride. The highest chloride value was reported in the 20-foot sample (59.5 mg/Kg) and decreased to less than the method detection limit (<4.93 mg/Kg) in the 60-foot sample. Groundwater samples were collected from well MW-2 on December 4, 2007, and analyzed by DHL for BTEX, dissolved metals, anions and cations. No BTEX was reported in the groundwater samples and metals, ions and anions were below the WQCC human health and domestic water quality standards.

On April 8, 2008, LAI personnel collected samples from wells MW-1 and MW-2 using methods and procedures previously described. The samples were analyzed by DHL for BTEX, anions and cations. No BTEX was reported in the samples, but chloride (2,070 mg/L) and TDS (3,980 mg/L) exceeded the WQCC domestic water quality standards in MW-1. Chloride and TDS in sample MW-2 were below the WQCC domestic water

Mr. Wayne Price  
June 15, 2008  
Page 3

standards. Table 3 presents a summary of the groundwater sample results. Appendix B presents the laboratory reports.

#### **Soil Remediation**

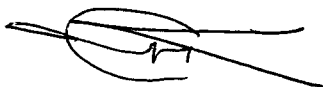
Between April 2, 2008 and May 2, 2008, soil remediation was performed at the Site according to the OCD approved remediation plan. Environmental Plus, Inc. (EPI), located in Eunice, New Mexico, was contracted to provide excavation services and removed soil from about 1 to 2 feet bgs south and west of the tank battery, and to about 7 feet bgs at two (2) locations in the pit area located west of the battery. The pit excavations measured approximately 60 x 90 x 7 feet and 30 x 40 x 7 feet, respectively, and were lined with a 20-mil thickness polyethylene material before filling with clean soil. The surface of the pit excavations was crowned for storm rainwater drainage. The remaining excavations were also filled with clean soil and the entire remediation area was seeded with a blend of side oats and gramma grass, as requested by the landowner. EPI hauled approximately 4,740 cubic yards of contaminated soil to the JHHC centralized surface waste management facility (NM-02-0021) located in the W/2 SW/4 and W/2 NW/4, Section 15, Township 24 South and Range 35 East NMPM. Appendix C presents photographs.

#### **Conclusion**

JHHC requests OCD approval of no further action for soil remediation at the Site. Please contact Ms. Carolyn Haynes with JHHC at (575) 390-9689 if you have questions. I may be reached with questions at (432) 687-0901 or email mark@laenvironmental.com.

Sincerely,

***Larson & Associates, Inc.***



Mark J. Larson, P.G., C.P.G., C.G.W.P.  
Senior Project Manager

Encl.

cc: Carolyn Haynes, JHHC  
Larry Johnson, OCD District 1

## Tables

Table 1

1R-0483

Summary of Monitoring Well Drilling and Completion Details  
 John H. Hendrix Corporation, Elliott B-9 #1, #4 and #5 Tank Battery  
 Unit C (NE/4, NW/4), Section 9, Township 22 South, Range 37 East  
 Lea County, New Mexico

Well	Drilled Depth (Feet BGS)	Drill Date	Well Depth (Feet TOC)	Casing Stickup (Feet)	Screen Interval (Feet BGS)	Stablized Groundwater Level (Feet BGS)
MW-1	90	10/16/2007	90.27	3.30	67.03 - 86.34	77.99 (10/16/2007)
MW-2	91	12/03/2007	92.84	2.40	70.50 - 89.81	78.79 (12/03/2007)

Notes: Wells Drilled and Installed by Scarborough Drilling, Inc., Lamea, Texas, using Air Rotoary Methods.

1. BGS: Feet below ground surface

2. TOC: Depth measured from top of PVC well casing.

Table 2

1R-0483

Summary of Laboratory Analysis of Monitoring Well Soil Samples  
 John H. Hendrix Corporation, Elliott B-9 #1, #4 and #5 Tank Battery  
 Unit C (NE/4, NW/4), Section 9, Township 22 South, Range 37 East  
 Lea County, New Mexico

Sample	Depth (Feet)	Date	GRO C6 - C12 (mg/Kg)	DRO > C12 - C28 (mg/Kg)	TPH C6 - C28 (mg/Kg)	Chloride (mg/Kg)
RRAL: 1,000						
MW-1	0	10/15/2007	<15.2	<15.2	<30.4	21.3
	20	10/15/2007	21.4	26.9	48.3	42.5
	40	10/15/2007	<15.3	<15.3	<30.6	42.5
	60	10/15/2007	<15.7	<15.7	<31.4	53.2
MW-2	0	12/03/2007	--	--	--	<5.01
	20	12/03/2007	--	--	--	59.5
	40	12/03/2007	--	--	--	5.83
	60	12/03/2007	--	--	--	<4.93

Notes: Analysis performed by Environmental Laboratories of Texas, Odessa, Texas

Results are reported in milligrams per kilogram (mg/Kg)

1. GRO: Gasoline - range organics
2. DRO: Diesel - range organics
3. TPH: Total Petroleum Hydrocarbons (Sum of GRO + DRO)
4. <: Less than method detection limit
5. --: No data available

Table 3

1R0483

**Summary of Laboratory Analysis of Monitoring Well Samples**  
**John H. Hendrix Corporation, Elliott B-9 Tank Battery #1, #4 and #5**  
**Unit C (NE/4,NW/4), Section 9, Township 22 South, Range 37 East**  
**Lea County, New Mexico**

Parameter	Reporting Units	WQCC Threshold (mg/L)	MW-1 10/16/07	MW-1 4/8/08	MW-2 12/4/07	MW-2 4/8/08
Chloride	mg/L	250	1,710	2,070	57	61.7
Fluoride	mg/L	1.6	1.70	--	--	--
Nitrate-N	mg/L	10	1.83	--	--	--
Sulfate	mg/L	600	223	214	88	87.2
Alkalinity, Bicarbonate	mg/L	--	215	200	204	240
Alkalinity, Carbonate	mg/L	--	<10	<10	<10	<10
Alkalinity, Hydroxide	mg/L	--	<10	<10	<10	<10
Alkalinity, Total	mg/L	--	215	200	204	240
pH	pH units	6 - 9	7.02	6.44	--	6.95
Total Dissolved Solids	mg/L	1,000	3,300	3,980	542	535
<b>Volatile Organics</b>						
Benzene	mg/L	0.01	<0.0008	<0.0008	<0.0008	<0.0008
Ethylbenzene	mg/L	0.75	<0.002	<0.002	<0.002	<0.002
Toluene	mg/L	0.75	<0.002	<0.002	<0.002	<0.002
Total Xylenes	mg/L	0.62	<0.003	<0.003	<0.003	<0.003
Total BTEX	mg/L	--	<0.0078	<0.0078	<0.0078	<0.0078
<b>Metals</b>						
Arsenic	mg/L	0.1	0.00694	--	0.02200	--
Barium	mg/L	1.0	0.073	--	0.034	--
Cadmium	mg/L	0.01	<0.0003	--	<0.0003	--
Calcium	mg/L	--	370	--	37	--
Chromium	mg/L	0.05	<0.002	--	<0.002	--
Lead	mg/L	0.05	<0.0003	--	<0.0003	--
Magnesium	mg/L	--	167	--	15	--
Mercury	mg/L	0.002	<0.00008	--	<0.00008	--
Potassium	mg/L	--	12.7	--	4.4	--
Selenium	mg/L	0.05	0.00938	--	0.00653	--
Silver	mg/L	0.05	<0.001	--	<0.001	--
Sodium	mg/L	--	445	--	93	--

Notes: Analysis performed by DHL Analytical, Inc., Round Rock, Texas

1. mg/L: Milligrams per liter
2. <: Below method detection limit
3. --: No data available



## Figures

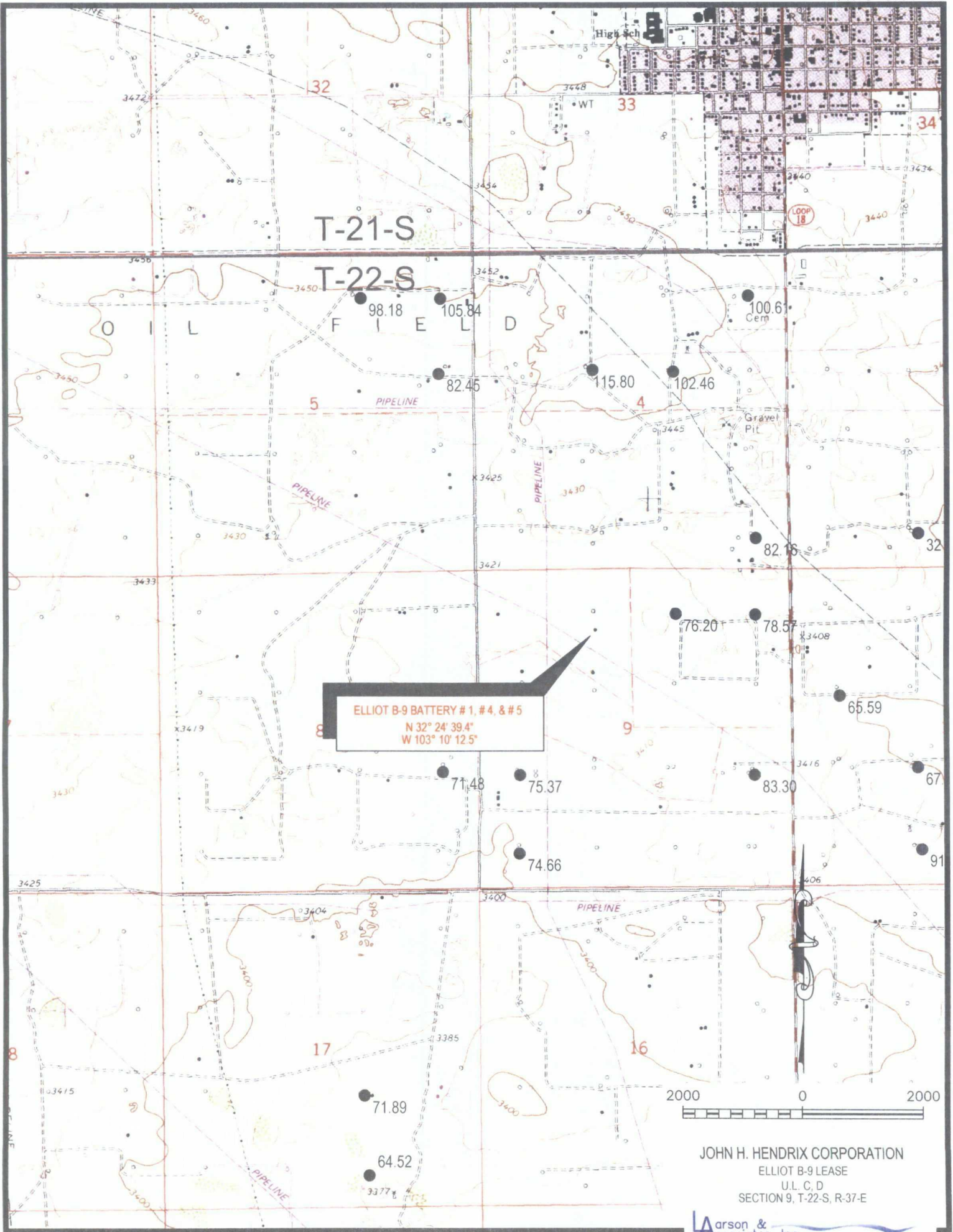
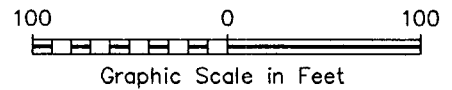
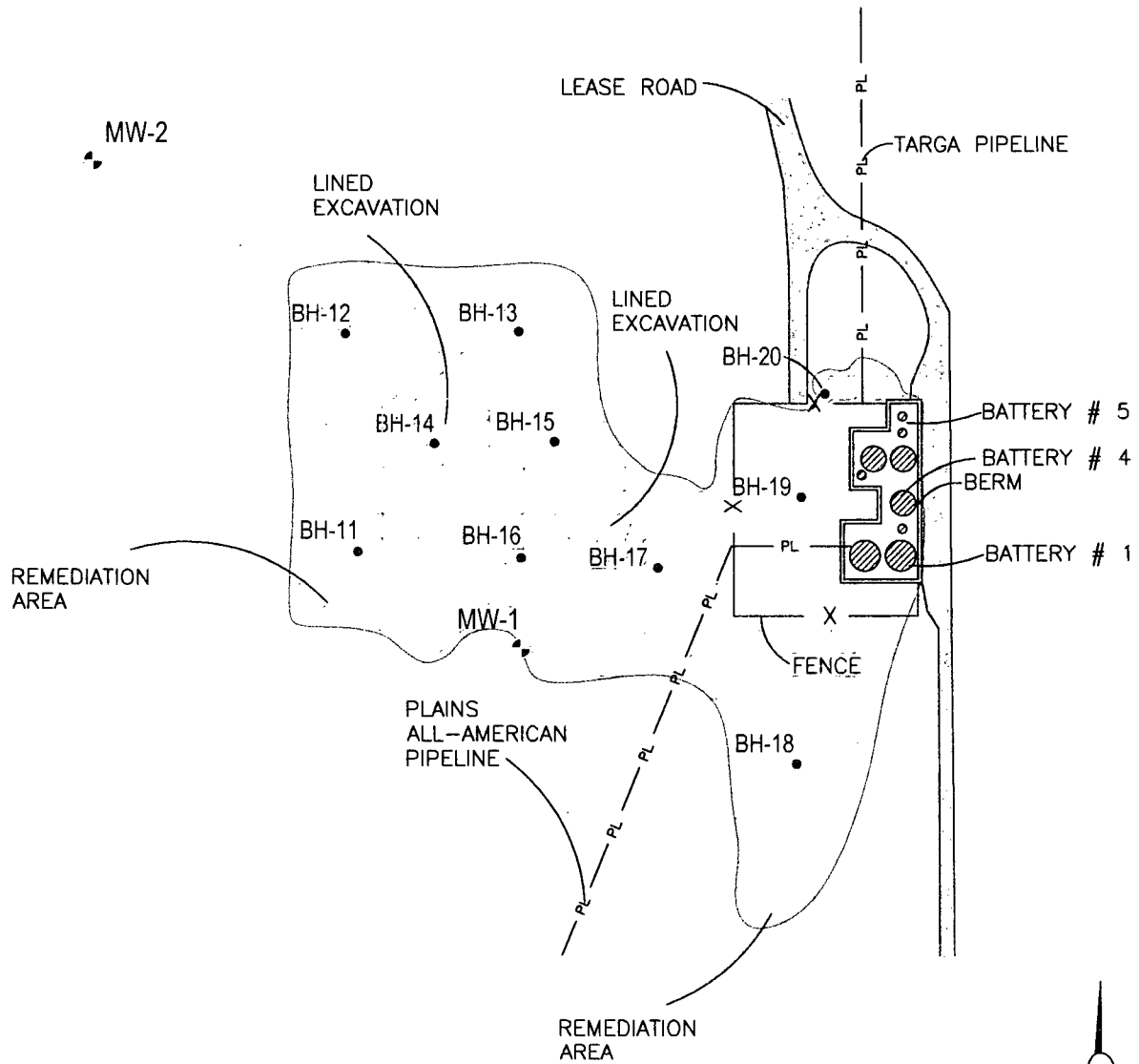


FIGURE 1- SITE LOCATION ELLIOTT B-9 BATTERY #1, #4 & #5

JOHN H. HENDRIX CORPORATION  
 ELLIOT B-9 LEASE  
 U.L.C.D  
 SECTION 9, T-22-S, R-37-E

Larson & Associates, Inc.  
 Environmental Consultants



LEGEND

- BH-11 • BORE HOLE LOCATION
- MW-2 ◉ MONITORING WELL LOCATION

JOHN H. HENDRIX CORPORATION  
 ELLIOT LEASE B-9 BATTERY # 1, #4 & #5  
 U.L. D. (NE/4, NW/4)  
 SECTION 9, T-22-S, R-37-E  
 LEA COUNTY, NEW MEXICO

**L**arson &  
 associates, Inc.  
 Environmental Consultants

FIGURE 2- IR0483 REMEDIATION AND EXCAVATION AREAS

**Appendix A**

**OCD Correspondence**

## Mark Larson

---

**From:** Price, Wayne, EMNRD [wayne.price@state.nm.us]  
**Sent:** Thursday, August 30, 2007 11:26 AM  
**To:** Price, Wayne, EMNRD; mark@laenvironmental.com; mburrows@valornet.com  
**Cc:** VonGonten, Glenn, EMNRD; Hansen, Edward J., EMNRD  
**Subject:** RE: Technical meeting held Aug. 29, 2007

1R0483 and 1R0484 Elliott B-9 Lease: OCD is in receipt of the January 09, 2007 Investigation reports for the Elliot B-9 Battery#2 and #3, and the Battery #1,#4 and #5.

It was agreed upon at the meeting that monitor wells shall be located in close proximity in order to determine if groundwater has been impacted. OCD reviewed the reports this morning and found that some data was missing from the tables. We understand that you have had some drafting problems in this area. However, at this time we would like to see the groundwater data before we approve the proposed remediation plan. Please include this E-mail in your final closure plan.

---

**From:** Price, Wayne, EMNRD  
**Sent:** Thursday, August 30, 2007 9:59 AM  
**To:** mark@laenvironmental.com; 'mburrows@valornet.com'  
**Cc:** VonGonten, Glenn, EMNRD; Hansen, Edward J., EMNRD  
**Subject:** Technical meeting held Aug. 29, 2007

1R0482 Penrose Federal - OCD is in receipt of the January 09 and May 10, 2007 documents and pursuant to our discussions on August 29, 2007 hereby approves installation of the monitor well in close proximity to the pit and approves the proposed remediation plan. Please include this E-mail notice in the final closure report.

Wayne Price-Environmental Bureau Chief  
Oil Conservation Division  
1220 S. Saint Francis  
Santa Fe, NM 87505  
E-mail [wayne.price@state.nm.us](mailto:wayne.price@state.nm.us)  
Tele: 505-476-3490  
Fax: 505-476-3462

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the Sybari - Antigen Email System.

## Mark Larson

---

**From:** Price, Wayne, EMNRD [wayne.price@state.nm.us]  
**Sent:** Monday, December 17, 2007 4:13 PM  
**To:** Mark Larson  
**Subject:** John Hindrex 1R0483 and 1R0484 Elliot

Dear Mark,

Sorry for the delay, I was out sick with the flu. Pursuant to our meeting last week OCD hereby approves the pit closure plans as described in the meeting. Groundwater monitoring and possible remediation will continue as discussed.

Please be advised that OCD approval of this plan does not relieve the owner/operator of responsibility should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Wayne Price-Environmental Bureau Chief  
Oil Conservation Division  
1220 S. Saint Francis  
Santa Fe, NM 87505  
E-mail [wayne.price@state.nm.us](mailto:wayne.price@state.nm.us)  
Tele: 505-476-3490  
Fax: 505-476-3462

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the Sybari - Antigen Email System.

**Appendix B**

**Laboratory Reports**

**Appendix C**

**Photographs**



#1R0484

John H. Hendrix Corporation

Elliot B-9 Tank Battery



Finished Remediation Area West of Tank Battery Looking Northeast



Finished Remediation Area West of Tank Battery Looking East

#1R0484

John H. Hendrix Corporation

Elliot B-9 Tank Battery



Finished Remediation Area South and West of Tank Battery Looking Southeast



Finished Remediation Area South and West of Tank Battery Looking Northwest



#1R0484

John H. Hendrix Corporation

Elliot B-9 Tank Battery



Finished Remediation Area South and West of Tank Battery Looking Northwest