1R - 465

WORKPLAN

12/09/2005

Larson & Associates, Inc.
Environmental Consultants

RECEIVED
1RP0465

DEC 09 2005

Oil Conservation Division
Environmental Bureau

December 6, 2005

VIA EMAIL: Glenn.VonGonton@state.nm.us
VIA CERTIFIED MAIL

Mr. Glenn Von Gonton
Senior Hydrologist
State of New Mexico
Oil Conservation Division – Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Ground Water Investigation Work Plan, John H. Hendrix Corporation, Will Cary #5 Emergency Pit, Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East, Lea County, New Mexico

Dear Mr. Von Gonton:

This letter is submitted to the State of New Mexico Oil Conservation Division ("OCD") on behalf of John H. Hendrix Corporation ("JHHC") by Larson and Associates, Inc. ("LA"), its consultant, and presents the results of laboratory analysis of a ground water sample collected from the background monitoring well (MW-2) that was installed northwest of a former emergency pit ("Site") previously located at the Will Cary Lease in unit letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East, Lea County, New Mexico. The latitude and longitude for the Site are north 32° 22' 48.5" and west 103° 09' 03.4". Contact information for the Site is as follows:

Operator:	John H. Hendrix Corporation
Contact:	Ron Westbrook
Address:	110 N. Marienfeld Street, Suite 400
	Midland, Texas 79701
Telephone:	(432) 684-6631

Figure 1 presents a location and topographic map. Figure 2 presents a Site drawing.

Background

On July 6, 2004, OCD observed the pit while conducting an inspection of the Will Cary Lease and required JHHC to close the pit according to OCD rules. During April 2005 approximately 1,600 cubic yards of soil was excavated from the pit and hauled to the JHHC centralized surface waste management facility (NM-02-0021) located approximately seven (7) miles northwest of Jal, New Mexico. On August 4, 2005, OCD granted verbal approval to close the excavation, but required JHHC to install a protective barrier (i.e., clay) near the top of the excavation and a monitoring well southeast of the excavation. Beginning on August 10, 2005, the excavation was filled with clean soil to approximately 6 feet bgs, clay was placed from approximately 4 to 6 feet bgs and compacted to 95% proctor density. The remainder of the excavation above the clay was filled with clean soil to ground surface.

On September 13, 2005, LA supervised installation of monitoring well MW-1 about twenty (20) feet southeast of the excavation. Scarborough Drilling, Inc. ("Scarborough"), drilled the well to approximately 90 feet bgs using a truck-mounted rotary rig and water to circulate drill cuttings from the boring. Scarborough developed the well using a rig bailer and placed the water in a 55-gallon drum. Ground water stabilized at approximately 68 feet bgs and samples were collected on September 20, 2005, after the well was purged using a dedicated disposable polyethylene bailer. The ground water samples were labeled, chilled in an ice chest, delivered under chain of custody control and analyzed by Environmental Lab of Texas, Inc. ("ELTI"), for benzene, toluene, ethyl benzene, xylene ("BTEX"), dissolved metals (arsenic, cadmium, chromium, lead, mercury, selenium and silver), anions (alkalinity, chloride, sulfate) cations (calcium, magnesium, potassium, sodium) and total dissolved solids ("TDS"). The excavation closure details, monitoring well installation and ground water sample results were submitted to OCD on September 28, 2005, in a report titled *"Closure Report for Unlined Pit Excavation and Results of Groundwater Sample Analysis, John H. Hendrix Corporation, Will Cary Lease, Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East, Lea County, New Mexico"*. The report included a proposal to install a background monitoring well northwest of the former emergency pit. OCD approved the proposal on October 25, 2005, but required JHHC to submit a work plan to delineate ground water contamination if the background sample confirmed that ground water has been impacted. Appendix A presents correspondence from OCD.

Current Investigation

On November 8, 2005, well MW-2 was drilled approximately 450 feet northwest of the former pit. Scarborough drilled the well to approximately 82 feet bgs in the manner previously described, and constructed the well using 2-inch schedule 40 PVC casing and screen. Approximately fifteen (15) feet of screen was placed in the well from approximately 65.46 to 79.72 feet bgs and surrounded with graded silica sand (10 – 20) to about 62 feet bgs. Bentonite chips were placed from approximately 60 to 62 feet bgs and hydrated with potable water. The remainder of the annulus was filled with cement and bentonite grout to about 1-foot bgs and a locking steel cover was installed in concrete. Sarborough developed the well using a rig bailer until water was visibly clear of sediment. The water was placed in a 55-gallon drum and retained at the Site until disposal is arranged. Drill cuttings were described according to the Unified Soil Classification System ("USCS") and placed on the ground adjacent to the well. Figure 2 presents the well location. Table 1 presents a summary of the monitoring well drilling and completion details. Appendix B presents the well completion diagram and geologic log.

On November 15, 2005, LA personnel purged wells MW-1 and MW-2 using dedicated disposable polyethylene bailers to remove approximately three (3) casing volumes of ground water. Ground water samples were collected using the dedicated bailers, carefully poured into laboratory-prepared containers, labeled, chilled in an ice chest and delivered under chain of custody control to ELTI, which analyzed the samples for BTEX, anions, cations and TDS. A sample from well MW-2 was also filtered using a 0.45 micron disposable filter and analyzed for dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Table 2 presents a summary of the BTEX analysis. Table 3 presents a summary of the dissolved metals analysis. Table 4 presents a summary of the anion, cation and TDS analysis. Appendix C presents the laboratory report.

Referring to Table 2, BTEX was not detected in samples from either well at method detection limit concentrations. No metal constituents exceeded the State of New Mexico Water Quality Control Commission ("WQCC") human health standards. Chloride was reported in samples from wells MW-1 and MW-2 at 12,100 milligrams per liter ("mg/L") and 101 mg/L, respectively. TDS was reported in samples from wells MW-1 and MW-2 at 21,400 mg/L and 694 mg/L, respectively. The chloride and TDS analysis from well MW-1 exceed the WQCC domestic water quality standards of 250 mg/L and 1,000 mg/L, respectively, and confirm that ground water impact has occurred.

Proposed Investigations

JHHC proposes to conduct the following investigations to assess the extent of the ground water impact:

- Review aerial photographs to assess other potential sources in the vicinity of the Site;
- Consider an electromagnetic ("EM") terrain conductivity survey to qualitatively assess the plume;
- Install 3 to 5 monitoring wells east, north and south of the Site, collect and analyze ground water samples for anions, cations and TDS;
- Survey wells for ground and top of casing elevation;
- Determine depth to ground water, ground water flow direction and gradient;
- Perform slug tests in wells to calculate an average horizontal hydraulic conductivity for the aquifer;
- Perform field reconnaissance to locate water wells within 1000 feet of the Site; and
- Prepare a report.

JHHC will review historical aerial photographs for the Site and surrounding area to evaluate other sources that could have potentially impacted ground water and affect locations for monitoring wells. An electromagnetic ("EM") terrain conductivity survey will be considered to qualitatively assess the plume limits and select locations for monitoring wells. The EM method measures the electrical conductivity of soil, rock and groundwater by imparting an alternating electric current into the subsurface from a surface transmitter. The primary factors that contributes to the conductivity of soil and rock is formation water and TDS. An EM-34 terrain conductivity meter, manufactured by Geonics, Ltd., in Toronto, Ontario, Canada, will be used if the EM survey is performed. The EM-34 has exploration capabilities ranging from approximately 0 to 196.9 feet bgs, depending on transmitter coil and receiver coil separation (i.e., 10, 20 or 40 meters) and orientation of the transmitter coil and receiver coil (i.e., horizontal dipole ("HD") mode or vertical dipole ("VD") mode). The EM-34 has a depth of exploration using the 10 meter coil spacing and HD mode from 0 to about 24.6 feet bgs and 0 to about 49.2 feet bgs in the VD mode. The EM-34 has a depth of exploration using the 20 meter coil spacing and HD mode from 0 to about 49.2 feet BGS and 0 to about 98.4 feet bgs in the VD mode. The

conductivity response is greater near ground surface in the HD mode. The conductivity response is null near the surface and increases rapidly to a depth equal to about 0.4 times the coil spacing in the VD mode. The greatest conductivity response in the VD mode occurs at approximately 32.8 feet bgs (10 meter) and 65.6 feet bgs (20 meter) and 78.4 feet bgs (40 meter). EM measurements are normally collected using sample grids and results are compared to background to determine areas of elevated conductivity.

The monitoring wells will be drilled and completed using the procedures described earlier using a rotary rig and water to circulate drill cuttings from the borings. The wells will be drilled about 5 feet into shale (red bed) that underlies the Site and completed with 2-inch schedule 40 PVC casing and screen. Approximately fifteen (15) feet of screw-threaded screen will be placed in each well, with about 10 feet of screen in ground water and about 5 feet of screen above groundwater. Each well will be secured with a locking steel above-grade cover anchored in concrete. A New Mexico licensed professional land surveyor will survey the wells for top of casing and ground elevation referenced to a USGS datum. Drill cuttings will be described according to the USCS and placed on the ground adjacent to the wells. The wells will be bailed using a rig bailer to remove sediment and water from drilling. Figure 2 shows the proposed well locations, which could change depending on the EM survey results and field conditions.

Depth to ground water will be measured in all wells and recorded at the top of PVC casing using an electronic water level meter. The measurements will be used to prepare a ground water potentiometric surface map and determine ground water flow direction and gradient. The wells will be purged using dedicated disposable polyethylene bailers or pumped using an electronic submersible pump and dedicated tubing. Groundwater samples will be collected from the pump discharge or carefully poured from the bailers into laboratory prepared sample containers. The sample containers will be labeled, chilled in an ice chest, delivered under chain of custody control to ELTI and analyzed for anions, cations and TDS. Conductivity will be measured in each well to assess chemical stratification.

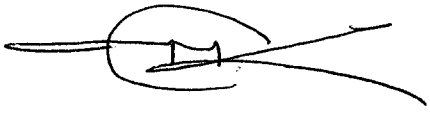
Horizontal hydraulic conductivity (slug) tests will be performed in each well to calculate an average hydraulic conductivity for the aquifer and assess ground water flow velocity. Falling and rising head tests will be performed at each well by lowering (falling head) and raising (rising head) a weighted PVC tube (slug) in the well. A pressure transducer will be installed near the bottom of the well to measure changes in head, which will be recorded using an electronic data logger. Horizontal hydraulic conductivity will be calculated using the Bouwer and Rice or equivalent method.

OCD will be notified at least 48 hours in advance of fieldwork and a report will be prepared and submitted following completion of fieldwork, receipt and review of analytical reports. The report will describe the geology, hydrogeology and aquifer characteristics, including ground water elevation, flow direction, gradient, horizontal hydraulic conductivity, inorganic contaminant distribution, chemical stratification. Recommendations for additional investigation or remedial actions will be proposed. Exhibits will include location and base maps, geological cross sections, aquifer thickness map, groundwater flow map and isopleth maps for chloride and TDS. The laboratory analyses will be summarized in tables and EM field sheets, geologic logs, well completion diagrams, slug test results and laboratory analysis will be included as attachments.

Please call Mr. Ron Westbrook with JHHC at (432) 684-6681, myself at (432) 687-0901 or email ronniew@jhhc.org or mark@laenvironmental.com if you have questions.

Sincerely,

Larson and Associates, Inc.



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

Encl.

cc: Ron Westbrook/JHHC
Marvin Burrows/JHHC
Paul Sheeley/OCD District 1

Tables

Table 1
Summary of Monitoring Well Drilling and Completion Details
John H. Hendrix Corporation, Will Cary #5 Emergency Pit
Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East
Lea County, New Mexico

Well Number	Date Drilled	Depth (Feet BGS)	Diameter (Inches)	Top-of-Casing Elevation (Feet AMSL)	Ground Elevation (Feet AMSL)	Casing Stickup (Feet)	Screen Interval (Feet BGS)	Depth-to-Groundwater (Feet BGS) 11/15/05
MW-1	09/13/05	90.14	2	N/A	N/A	3.25	68.81 - 89.59	70.09
MW-2	11/08/05	82.40	2	N/A	N/A	3.00	65.41 - 79.72	70.55

Notes: Wells constructed with 2-inch Schedule 40 screw-threaded PVC casing and screen.
1. BGS: Depth in feet below ground surface
2. TOC: Depth in feet below top of well casing

Table 2
Summary of BTEX Analysis of Groundwater Samples
John H. Hendrix Corporation, Will Cary #5 Emergency Pit
Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East
Lea County, New Mexico

Well Number	Sample Date	Benzene mg/L	Toluene mg/L	Ethyl benzene mg/L	Xylene mg/L
WQCC Human Health Standard:		**0.01**	**0.8**	**0.75**	**0.62**
MW-1	09/20/05	<0.001	<0.001	<0.001	<0.004
	11/15/05	<0.001	<0.001	<0.001	<0.004
MW-2	11/15/05	<0.001	<0.001	<0.001	<0.004

Notes: Analyses performed by Environmental Lab of Texas I, Ltd., Odessa, Texas
1. mg/L: Milligrams per liter (equivalent to parts per million)
2. <: Less than method detection limit

Table 3

Summary of Dissolved Metals Analysis of Groundwater Samples

John H. Hendrix Corporation, Will Cary #5 Emergency Pit

Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East

Lea County, New Mexico

Well Number	Sample Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Selenium (mg/L)	Silver (mg/L)
WQCC Standard:		**0.1**	**1.0**	**0.01**	**0.05**	**0.05**	**0.002**	**0.05**	**0.05**
MW-1	09/20/05	0.0162	0.371	<0.001	<0.005	<0.011	<0.0005	0.0061	<0.005
MW-2	11/15/05	0.0215	0.0571	<0.004	0.0126	0.0148	<0.001	0.00653	<0.005

Notes:

1. Mg/L: Milligrams per liter
2. <: Less than method detection limit

Table 4

Summary of Anion, Cation and Total Dissolved Solids Analysis of Groundwater Samples

John H. Hendrix Corporation, Will Cary #5 Emergency Pit

Unit Letter F (SE/4, NW/4), Section 22, Township 22 South, Range 37 East

Lea County, New Mexico

Well Number	Sample Date	Alkalinity (mg/L)	Chloride (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)
WQCC Standard:			**250**	**1,000**	**300**				
MW-1	09/21/05	233	9550	19,300	1,200	870	519	102	4300
	11/15/05	292	12,100	21,400	1020	1090	675	214	7040
MW-2	11/15/05	164	101	694	146	74.4	49.8	10.0	109

Notes: Analyses by Environmental Lab of Texas, Inc., Odessa, Texas

1. mg/L: Milligrams per liter (equivalent to parts per million)

Figures

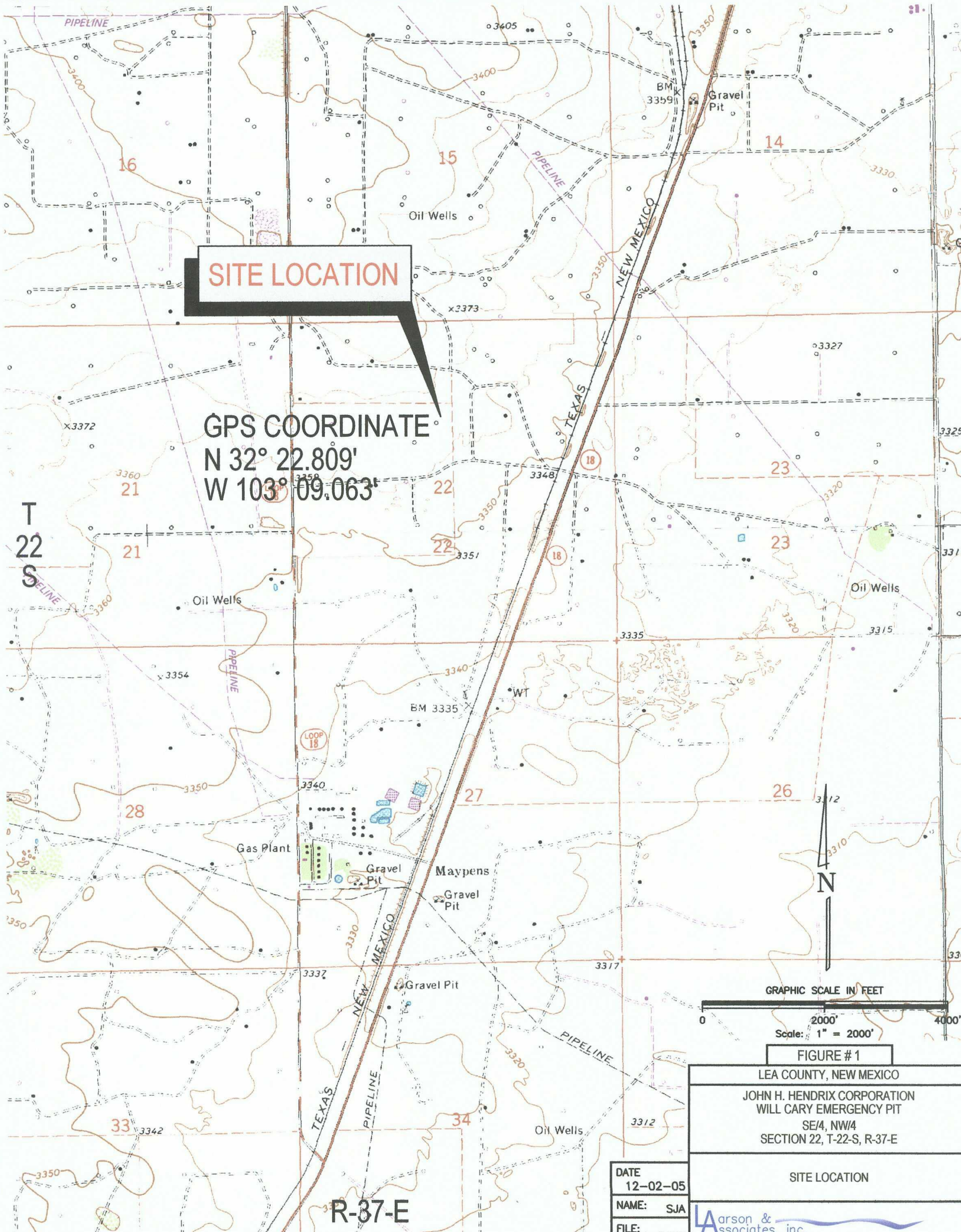


FIGURE # 1

LEA COUNTY, NEW MEXICO

JOHN H. HENDRIX CORPORATION
WILL CARY EMERGENCY PIT
SE/4, NW/4
SECTION 22, T-22-S, R-37-E

SITE LOCATION

DATE: 12-02-05
NAME: SJA
FILE: 4-0123

Larson & Associates, inc.
Environmental Consultants

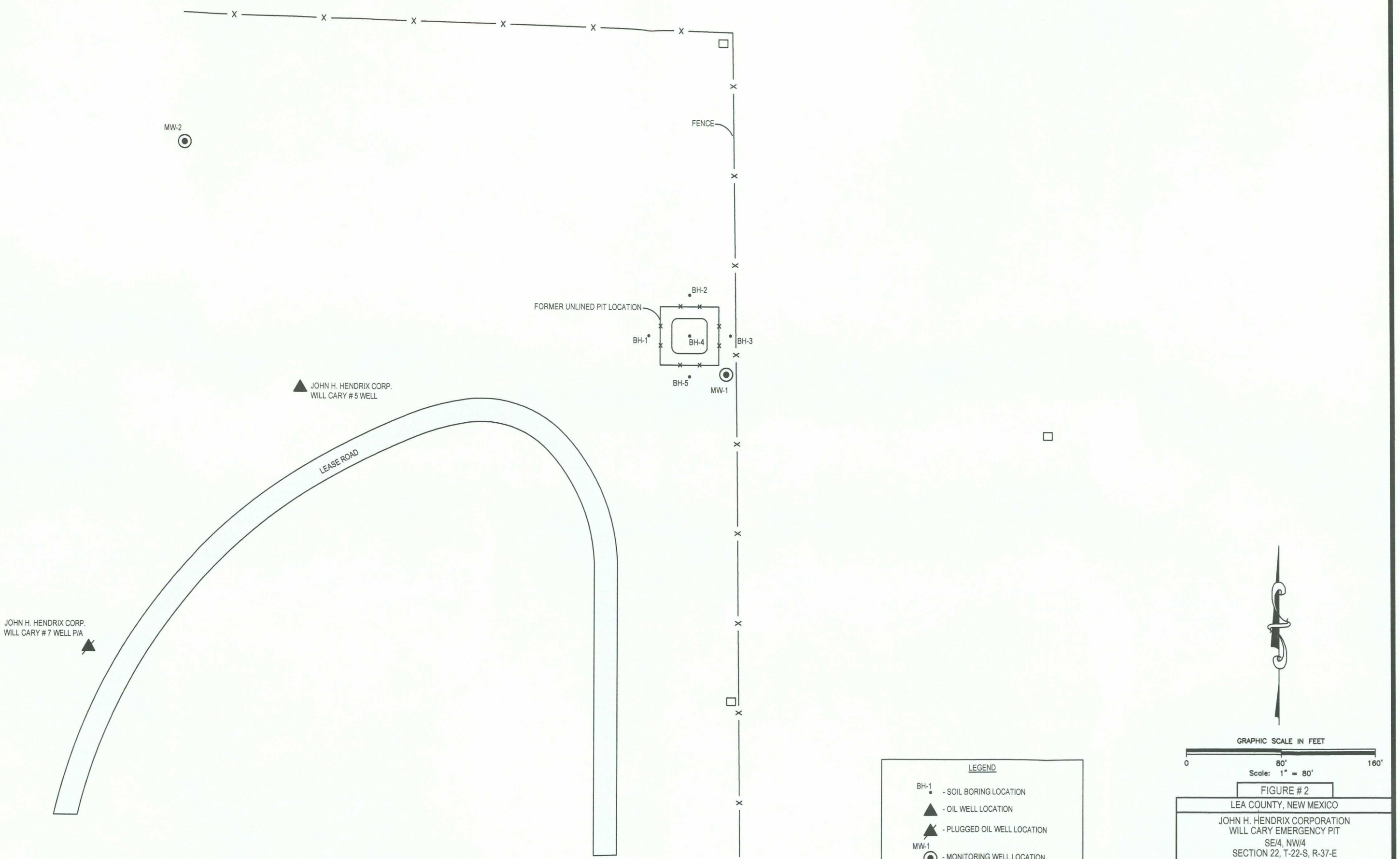


FIGURE # 2

LEA COUNTY, NEW MEXICO

JOHN H. HENDRIX CORPORATION
WILL CARY EMERGENCY PIT
SE/4, NW/4
SECTION 22, T-22-S, R-37-E

PROPOSED MONITOR WELLS AND WELL LOCATIONS

DATE	12-02-05
NAME:	SJA
FILE:	4-0123

Larson & Associates, inc.
Environmental Consultants

Appendix A

OCD Correspondence

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

October 5, 2005

Mr. Ron Westbrook, Vice President
John H. Hendrix Corporation
110 North Marienfeld
Suite 400
Midland, TX 79701

RE: CLOSURE REPORT FOR UNLINED PIT EXCAVATION AND RESULTS OF GROUNDWATER SAMPLE ANALYSIS, JOHN H. HENDRIX CORPORATION, WILL CARY LEASE, UNIT LETTER F (SE/4, NW/4), SECTION 22, TOWNSHIP 22 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO

Dear Mr. Westbrook:

The New Mexico Oil Conservation Division (OCD) has reviewed the September 28, 2005 closure report submitted by Larson & Associates, Inc. on behalf of John H. Hendrix Corporation (JHHC). JHHC notified OCD that ground water may have been impacted at a former unlined pit site at its Will Cary lease and proposed to install a monitoring well upgradient of the former pit to evaluate background water quality. OCD hereby approves JHHC's proposal.

If the analytical results confirm that ground water has been impacted, then OCD will require JHHC to submit an Abatement Plan in accordance with the Water Quality Control Commission Regulations (Sections 4103 through 4106, 20.6.2 NMAC). As I discussed with Mr. Larson, JHHC should follow OCD's guidance and install screens that are no more than 15 feet in length. If you have any questions, please call me at 505-476-3488.

Sincerely,

Glenn von Gonten
Senior Hydrologist

xc: Paul Sheeley, OCD Hobbs District Office

Appendix B

Monitoring Well Diagram and Lithologic Log

Client: John Hendrix Corpration

Project: Will Cary # 5

Project No.: 4-0123

Location: Lea County, New Mexico

Log: MW-2

Geologist: Mark Larson

Page: 1 of 1

SUBSURFACE PROFILE				SAMPLE			PID Measurement (PPM) 50 100 150	Well Detail	Notes
Depth	Description	Symbol	Ground Elevation	Number	Type	Recovery			
5	***Silty Sand*** 10 YR 7/3, Brown, very fine grained quartz sand, very poorly sorted, subround, dry								Well finished with locking cap above grade cover in concrete
10									
15	***Sand*** 7.5 YR 7/2, to 7/3, pinkish gray to pink, very fine grained quartz sand, very poorly sorted, round, dry								
20									0.00' - 60.00' BGS Cement / benonite grout
25	***Caliche*** 10 YR 7/2 to 8/2, Light gray to very pale brown, very fine grained quartz sand, hard, indurated								
30	***Silty Sand*** 7.5 YR 7/3, Pink, very fine grained quartz sand, poorly sorted, weakly cemented								0.00' - 65.41' BGS 2" Sch. 40 PVC threaded riser
35									
40									
45									
50									
55									
60									60.00' - 62.00' BGS Benonite Chips
65									62.00' - 82.40' BGS 10-20 Silica sand
70									70.55' BGS Water level , 11/15/05
75									65.41' - 79.72.' BGS 2" Sch. 40 PVC threaded screen 0.010" slots
80	***Shale*** 2.5 YR 4/6, Red, silty, firm								80.40' BGS 2" Sch. 40 PVC threaded cap
85	***TD: 82.40'***								
90									

Drilled By: Scarborough Drilling

Drill Method: Air Rotary

Drill Date: 11-08-05

Larson and Associates Inc.
507 N. Marienfeld, Suite 202
Midland, Texas 79701
(432) 687-0901

Hole Size: 5"

TOC Elevation: N/A

Checked By: MJL

Appendix C

Laboratory Report

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: John Hendrix/ Will Cary #5

Project Number: 4-0123

Location: None Given

Lab Order Number: 5K15008

Report Date: 11/21/05

Larson & Associates, Inc.	Project: John Hendrix/ Will Cary #5	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 4-0123	**Reported:**
Midland TX, 79710	Project Manager: Mark Larson	11/21/05 16:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-2	5K15008-01	Water	11/15/05 11:48	11/15/05 15:25
MW-1	5K15008-02	Water	11/15/05 12:59	11/15/05 15:25

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (5K15008-01) Water									
Benzene	ND	0.00100	mg/L	1	EK51705	11/17/05	11/17/05	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*99.3 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*87.0 %*	*80-120*		"	"	"	"	
MW-1 (5K15008-02) Water									
Benzene	ND	0.00100	mg/L	1	EK51705	11/17/05	11/17/05	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*100 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*86.0 %*	*80-120*		"	"	"	"	

General Chemistry Parameters by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (5K15008-01) Water									
Total Alkalinity	**164**	4.00	mg/L	2	EK51814	11/18/05	11/18/05	EPA 310.2M	
Chloride	**101**	5.00	"	10	EK51810	11/17/05	11/18/05	EPA 300.0	
Total Dissolved Solids	**694**	5.00	"	1	EK51808	11/17/05	11/18/05	EPA 160.1	
Sulfate	**146**	5.00	"	10	EK51810	11/17/05	11/18/05	EPA 300.0	
MW-1 (5K15008-02) Water									
Total Alkalinity	**292**	4.00	mg/L	2	EK51814	11/18/05	11/18/05	EPA 310.2M	
Chloride	**12100**	250	"	500	EK51810	11/17/05	11/18/05	EPA 300.0	
Total Dissolved Solids	**21400**	5.00	"	1	EK51808	11/17/05	11/18/05	EPA 160.1	
Sulfate	**1020**	250	"	500	EK51810	11/17/05	11/18/05	EPA 300.0	

Total Metals by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (5K15008-01) Water									
Calcium	**74.4**	0.100	mg/L	10	EK52113	11/21/05	11/21/05	EPA 6010B	
Magnesium	**49.8**	0.0100	"	"	"	"	"	"	
Potassium	**10.0**	0.500	"	"	"	"	"	"	
Sodium	**109**	0.500	"	50	"	"	"	"	
Mercury	ND	0.00100	"	2	EK51709	11/16/05	11/17/05	EPA 7470A	
Arsenic	**0.0215**	0.00800	"	10	EK51707	11/16/05	11/16/05	SW846-6020A	
Barium	**0.0571**	0.00200	"	"	"	"	"	"	
Cadmium	ND	0.00400	"	"	"	"	"	"	
Chromium	**0.0126**	0.00500	"	"	"	"	"	"	
Lead	**0.0148**	0.0120	"	"	"	"	"	"	
Selenium	**J [0.00653]**	0.0210	"	"	"	"	"	"	J
Silver	ND	0.00560	"	"	"	"	"	"	
MW-1 (5K15008-02) Water									
Calcium	**1090**	2.00	mg/L	200	EK52113	11/21/05	11/21/05	EPA 6010B	
Magnesium	**675**	0.200	"	"	"	"	"	"	
Potassium	**214**	2.50	"	50	"	"	"	"	
Sodium	**7040**	50.0	"	5000	"	"	"	"	

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51705 - EPA 5030C (GC)										
Blank (EK51705-BLK1)				Prepared & Analyzed: 11/17/05						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*0.0453*		"	*0.0400*		*113*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*0.0331*		"	*0.0400*		*82.8*	*80-120*			
LCS (EK51705-BS1)				Prepared & Analyzed: 11/17/05						
Benzene	0.0568	0.00100	mg/L	0.0500		114	80-120			
Toluene	0.0597	0.00100	"	0.0500		119	80-120			
Ethylbenzene	0.0587	0.00100	"	0.0500		117	80-120			
Xylene (p/m)	0.110	0.00100	"	0.100		110	80-120			
Xylene (o)	0.0597	0.00100	"	0.0500		119	80-120			
Surrogate: a,a,a-Trifluorotoluene	*0.0439*		"	*0.0400*		*110*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*0.0445*		"	*0.0400*		*111*	*80-120*			
Calibration Check (EK51705-CCV1)				Prepared & Analyzed: 11/17/05						
Benzene	55.8		ug/l	50.0		112	80-120			
Toluene	59.4		"	50.0		119	80-120			
Ethylbenzene	58.4		"	50.0		117	80-120			
Xylene (p/m)	106		"	100		106	80-120			
Xylene (o)	59.0		"	50.0		118	80-120			
Surrogate: a,a,a-Trifluorotoluene	*0.0442*		*mg/L*	*0.0400*		*110*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*0.0413*		"	*0.0400*		*103*	*80-120*			
Matrix Spike (EK51705-MS1)		**Source: 5K16003-04**		Prepared & Analyzed: 11/17/05						
Benzene	0.0520	0.00100	mg/L	0.0500	ND	104	80-120			
Toluene	0.0542	0.00100	"	0.0500	ND	108	80-120			
Ethylbenzene	0.0512	0.00100	"	0.0500	ND	102	80-120			
Xylene (p/m)	0.0918	0.00100	"	0.100	ND	91.8	80-120			
Xylene (o)	0.0517	0.00100	"	0.0500	ND	103	80-120			
Surrogate: a,a,a-Trifluorotoluene	*0.0395*		"	*0.0400*		*98.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*0.0340*		"	*0.0400*		*85.0*	*80-120*			

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51705 - EPA 5030C (GC)										
Matrix Spike Dup (EK51705-MSD1)		**Source: 5K16003-04**		Prepared & Analyzed: 11/17/05						
Benzene	0.0558	0.00100	mg/L	0.0500	ND	112	80-120	7.41	20	
Toluene	0.0579	0.00100	"	0.0500	ND	116	80-120	7.14	20	
Ethylbenzene	0.0551	0.00100	"	0.0500	ND	110	80-120	7.55	20	
Xylene (p/m)	0.0986	0.00100	"	0.100	ND	98.6	80-120	7.14	20	
Xylene (o)	0.0556	0.00100	"	0.0500	ND	111	80-120	7.48	20	
Surrogate: a,a,a-Trifluorotoluene	*0.0398*		"	*0.0400*		*99.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*0.0332*		"	*0.0400*		*83.0*	*80-120*			

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51808 - General Preparation (WetChem)										
Blank (EK51808-BLK1)				Prepared: 11/17/05 Analyzed: 11/18/05						
Total Dissolved Solids	ND	5.00	mg/L							
Duplicate (EK51808-DUP1)	**Source: 5K16003-01**			Prepared: 11/17/05 Analyzed: 11/18/05						
Total Dissolved Solids	1100	5.00	mg/L		1080			1.83	5	
Batch EK51810 - General Preparation (WetChem)										
Blank (EK51810-BLK1)				Prepared: 11/17/05 Analyzed: 11/18/05						
Sulfate	ND	0.500	mg/L							
Chloride	ND	0.500	"							
LCS (EK51810-BS1)				Prepared: 11/17/05 Analyzed: 11/18/05						
Chloride	8.13		mg/L	10.0		81.3	80-120			
Sulfate	9.29		"	10.0		92.9	80-120			
Calibration Check (EK51810-CCV1)				Prepared: 11/17/05 Analyzed: 11/18/05						
Chloride	8.44		mg/L	10.0		84.4	80-120			
Sulfate	9.84		"	10.0		98.4	80-120			
Duplicate (EK51810-DUP1)	**Source: 5K15008-01**			Prepared: 11/17/05 Analyzed: 11/18/05						
Chloride	101	5.00	mg/L		101			0.00	20	
Sulfate	146	5.00	"		146			0.00	20	
Batch EK51814 - General Preparation (WetChem)										
Blank (EK51814-BLK1)				Prepared & Analyzed: 11/18/05						
Total Alkalinity	ND	2.00	mg/L							

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51814 - General Preparation (WetChem)										
Duplicate (EK51814-DUP1)		**Source: 5K10007-01**		Prepared & Analyzed: 11/18/05						
Total Alkalinity	166	4.00	mg/L		168			1.20	20	
Reference (EK51814-SRM1)				Prepared & Analyzed: 11/18/05						
Bicarbonate Alkalinity	229		mg/L	200		114	80-120			

Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51707 - EPA 3005A										
Blank (EK51707-BLK1)				Prepared: 11/15/05 Analyzed: 11/16/05						
Arsenic	ND	0.000800	mg/L							
Barium	ND	0.000200	"							
Cadmium	ND	0.000400	"							
Chromium	ND	0.000500	"							
Lead	ND	0.00120	"							
Selenium	ND	0.00210	"							
Silver	ND	0.000560	"							
LCS (EK51707-BS1)				Prepared: 11/15/05 Analyzed: 11/16/05						
Arsenic	0.804	0.000800	mg/L	0.800		100	85-115			
Barium	0.220	0.000200	"	0.200		110	85-115			
Cadmium	0.206	0.000400	"	0.200		103	85-115			
Chromium	0.202	0.000500	"	0.200		101	85-115			
Lead	1.06	0.00120	"	1.10		96.4	85-115			
Selenium	0.409	0.00210	"	0.400		102	85-115			
Silver	0.110	0.000560	"	0.100		110	85-115			
LCS Dup (EK51707-BSD1)				Prepared: 11/15/05 Analyzed: 11/16/05						
Arsenic	0.800	0.000800	mg/L	0.800		100	85-115	0.499	20	
Barium	0.217	0.000200	"	0.200		108	85-115	1.37	20	
Cadmium	0.206	0.000400	"	0.200		103	85-115	0.00	20	
Chromium	0.204	0.000500	"	0.200		102	85-115	0.985	20	
Lead	1.05	0.00120	"	1.10		95.5	85-115	0.948	20	
Selenium	0.402	0.00210	"	0.400		100	85-115	1.73	20	
Silver	0.0990	0.000560	"	0.100		99.0	85-115	10.5	20	
Calibration Check (EK51707-CCV1)				Prepared: 11/15/05 Analyzed: 11/16/05						
Arsenic	0.0516		mg/L	0.0500		103	90-110			
Barium	0.0511		"	0.0500		102	90-110			
Cadmium	0.0512		"	0.0500		102	90-110			
Chromium	0.0506		"	0.0500		101	90-110			
Lead	0.0498		"	0.0500		99.6	90-110			
Selenium	0.0511		"	0.0500		102	90-110			
Silver	0.0540		"	0.0500		108	90-110			

Total Metals by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK51707 - EPA 3005A										
Matrix Spike (EK51707-MS1)		**Source: 5K14006-01**		Prepared: 11/15/05 Analyzed: 11/16/05						
Arsenic	0.798	0.00800	mg/L	0.800	ND	99.8	75-125			
Barium	0.257	0.00200	"	0.200	0.0620	97.5	75-125			
Cadmium	0.203	0.00400	"	0.200	ND	102	75-125			
Chromium	0.207	0.00500	"	0.200	0.0108	98.1	75-125			
Lead	1.04	0.0120	"	1.10	0.00980	93.7	75-125			
Selenium	0.407	0.0210	"	0.400	ND	102	75-125			
Silver	0.116	0.00560	"	0.100	ND	116	75-125			
Batch EK51709 - EPA 7470A										
Blank (EK51709-BLK1)				Prepared & Analyzed: 11/17/05						
Mercury	ND	0.000500	mg/L							
LCS (EK51709-BS1)				Prepared & Analyzed: 11/17/05						
Mercury	0.00100	0.000500	mg/L	0.00100		100	85-115			
Calibration Check (EK51709-CCV1)				Prepared & Analyzed: 11/17/05						
Mercury	0.00100		mg/L	0.00100		100	90-110			
Matrix Spike (EK51709-MS1)		**Source: 5K15008-01**		Prepared & Analyzed: 11/17/05						
Mercury	0.00101	0.000500	mg/L	0.00100	ND	101	75-125			
Matrix Spike Dup (EK51709-MSD1)		**Source: 5K15008-01**		Prepared & Analyzed: 11/17/05						
Mercury	0.00105	0.000500	mg/L	0.00100	ND	105	75-125	3.88	20	
Batch EK52113 - 6010B/No Digestion										
Blank (EK52113-BLK1)				Prepared & Analyzed: 11/21/05						
Calcium	ND	0.0100	mg/L							
Magnesium	ND	0.00100	"							
Potassium	ND	0.0500	"							
Sodium	ND	0.0100	"							

Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK52113 - 6010B/No Digestion										
Calibration Check (EK52113-CCV1)				Prepared & Analyzed: 11/21/05						
Calcium	2.28		mg/L	2.00		114	85-115			
Magnesium	2.10		"	2.00		105	85-115			
Potassium	2.06		"	2.00		103	85-115			
Sodium	1.88		"	2.00		94.0	85-115			
Duplicate (EK52113-DUP1)		**Source: 5K15008-01**		Prepared & Analyzed: 11/21/05						
Calcium	69.8	0.100	mg/L		74.4			6.38	20	
Magnesium	48.1	0.0100	"		49.8			3.47	20	
Potassium	10.0	0.500	"		10.0			0.00	20	
Sodium	106	0.500	"		109			2.79	20	

Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Raland K Tuttle Date: 11-22-05

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: Larson

Date/Time: 11/15/05 15:25

Order #: 5K15005

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	5.0 C
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Not present
Custody Seals intact on sample bottles?	Yes	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	Yes	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Yes	No	
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

Variance Documentation:

Contact Person: - _____ Date/Time: _____ Contacted by: _____

Regarding:

Corrective Action Taken:

CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc.
Environmental Consultants
Fax: 432-687-0456
432-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: John Hendrix Corp.

SITE MANAGER: MARK LARSON

PROJECT NO.: 4-0123

PROJECT NAME: Will Cary #5

PAGE 1 OF 1

LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: BTEX	CATIONS	ANIONS	TDS	RCRA8 METALS				LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
11/15	1148	✓			MW-2	4	2	1	1	1	1				5K15002-01	
11/15	1259	✓			MW-1	3	2	1	1	1	1				-02	

SAMPLED BY: (Signature) DATE: 11/15 TIME: 1300

RELINQUISHED BY: (Signature) DATE: 11/15 TIME: 1525

RECEIVED BY: (Signature) DATE: ____ TIME: ____

RELINQUISHED BY: (Signature) DATE: ____ TIME: ____

RECEIVED BY: (Signature) DATE: ____ TIME: ____

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS AIRBILL #: ____
HAND DELIVERED UPS OTHER: ____

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

RECEIVING LABORATORY: ____
ADDRESS: ____
CITY: ____ STATE: ____ ZIP: ____
CONTACT: ____ PHONE: ____

RECEIVED BY: (Signature)
DATE: 11/15/05 TIME: 15:25

SAMPLE CONDITION WHEN RECEIVED:
500ml - poly 2 x VOA 1L - poly x2 5.0

LA CONTACT PERSON:

SAMPLE TYPE: