1R - 425-47

WORKPLANS

DATE:
3-10-09

L. Peter Galusky, Jr. Ph.D., P.G.
Texerra

March 10th, 2009

Mr. Brad Jones
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: **Investigation and Characterization Plan**
Rice Operating Company – Vacuum SWD System
VAC State K EOL: UL H Sec 27 T 17S R 35E

Sent via E-mail & U.S. Certified Mail w/ Return Receipt 7006 0100 0001 2438 3913

Dear Mr. Jones:

RICE Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Vacuum SWD System and has no ownership of any portion of the pipeline, well, or facility. The Vacuum SWD System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner AFE approval, and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission would be greatly appreciated.

For all such environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall generally have three submissions, as described below:

1. This Investigation and Characterization Plan (ICP) is proposed for data gathering and site characterization and assessment.
2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP) if this is warranted.
3. Finally, after implementing the remedy, a Closure Report with final documentation will be submitted.

Background and Previous Work

The site is located approximately four miles east/northeast of Buckeye, New Mexico (Figures 1a, 1b). The topography is gently sloping toward the southeast. Soils on the site are characterized in the Lea County Soil Survey as gravelly loam to a depth of approximately 6 inches, and this is underlain by several feet of hard caliche. NM OSE records indicate that groundwater is likely to be encountered at a depth of approximately 75+/- feet, occurring in unconsolidated Tertiary alluvium of the Ogallala Formation.

As part of the abandonment and closure of the Vacuum SWD system, Rice Operating Company (ROC) investigated soils beneath the former wood junction box at this location in April 2006. The wood junction box was removed and soils were sampled using a backhoe, creating a 40 by 30 by 12 ft deep excavation (Figures 2, 3). The excavated soil was blended on site and returned to the excavation up to 6 ft bgs, where a 1 ft thick, compacted clay layer was installed (Figure 4). The remaining fill was blended and then backfilled to the original ground level. Imported, clean topsoil was added as a top-cap and the disturbed area was seeded to native vegetation (Figure 5). A cross-sectional schematic diagram of the excavation is given in Figure 6.

Soil chloride concentrations beneath the former junction box increased from approximately 300 ppm near the surface to over 1,500 ppm at 12 ft bgs, the limit of excavation (Figures 7, 8). Petroleum hydrocarbons were below field PID detection limits throughout the extent of excavation, and this was confirmed by laboratory GRO and DRO being below laboratory detection limits (Figures 7, 9). OCD was notified that this site has potential for groundwater impact on August 7th, 2008.

It should be noted that there is no longer a threat of continued, compounded impact at this site as the former junction box has been removed and a clay barrier installed to impede downward migration of chlorides. Moreover, the Vacuum SWD system has been closed. Further, the surface (ecological) impact of this release was relatively small.

ROC proposes additional investigative work to determine if there is the potential for groundwater degradation from residual soil chlorides, which are the constituent of concern, as outlined below.

Proposed Work Elements

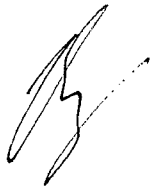
1. Summarize information and data collected by ROC to date.
2. Summarize additional, publicly available regional and local hydrological information.
3. Conduct vertical and lateral delineation of soil chlorides. If warranted, install a monitor well to provide a direct measurement of potential groundwater impact. [All monitoring wells will be constructed per NM Dept. Environment standards].
4. Evaluate the risk of groundwater impact in light of the information obtained.

If the evaluation demonstrates that residual constituents pose no threat to ground water quality, then only a surface restoration plan will be proposed to OCD. If this work indicates that there is a present or future risk of impacting groundwater quality from past operations at this location, then a corrective action plan (CAP) will be developed and proposed to OCD.

I appreciate the opportunity to work with you and your staff on this project. Please call either myself, at the number below, or Hack Conder (ROC) at 575-393-9174, if you have any questions or wish to discuss these matters.

Thank you for your consideration.

Sincerely,



L. Peter (**Pete**) Galusky, Jr. Ph.D., P.G.
Principal

Texerra
505 N. Big Spring, Suite 404
Midland, Texas 70701
Tel: 432-634-9257
E-mail: lpg@texerra.com
Web site: www.texerra.com

cc: Rice Operating Company, Edward Hansen (NMOCD)

Attachments: Site Maps, Photographs, Junction Box Disclosure Form, Laboratory Analyses

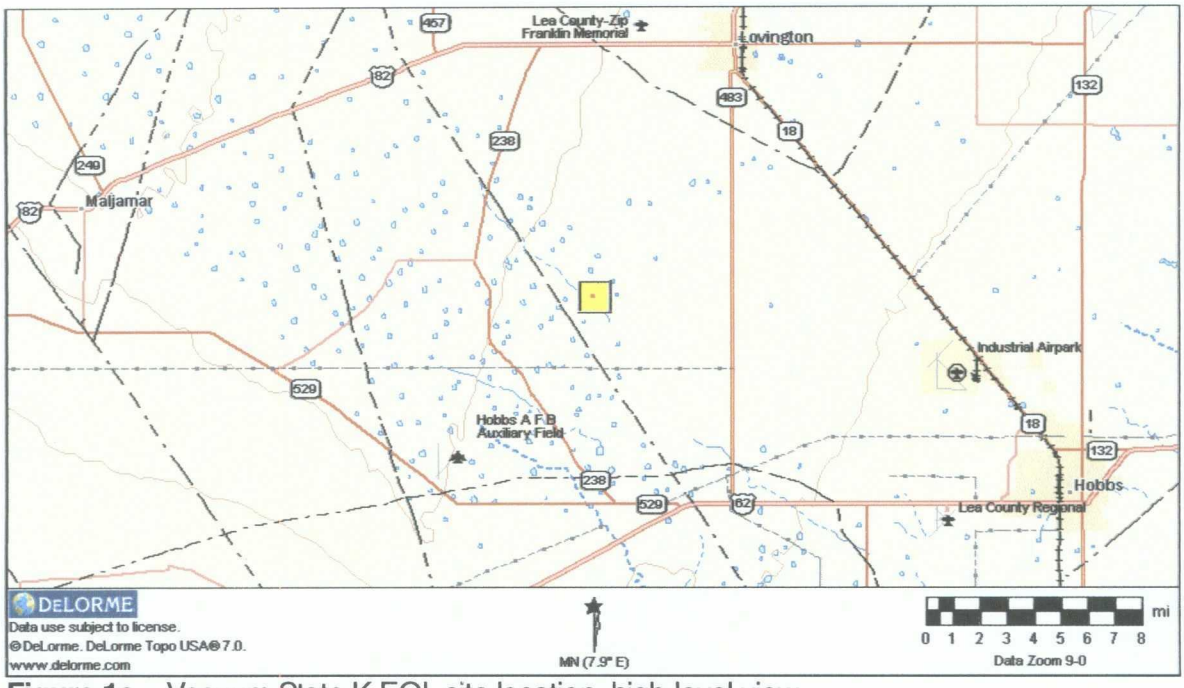


Figure 1a – Vacuum State K EOL site location, high-level view.

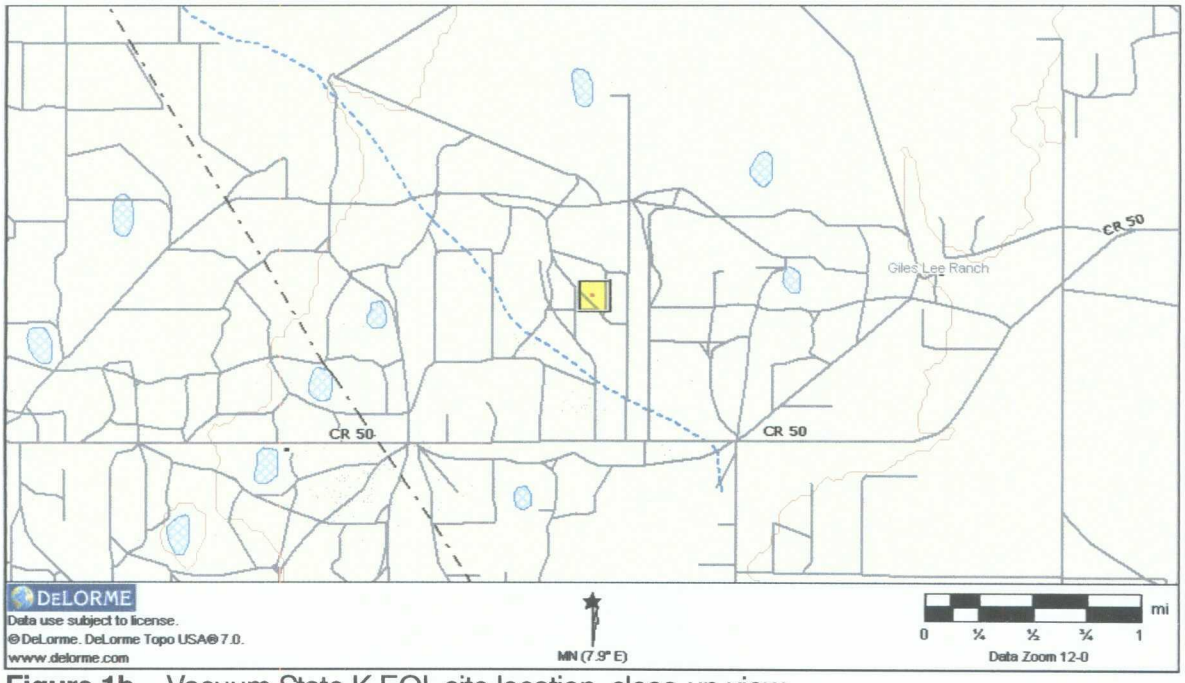


Figure 1b – Vacuum State K EOL site location, close-up view.

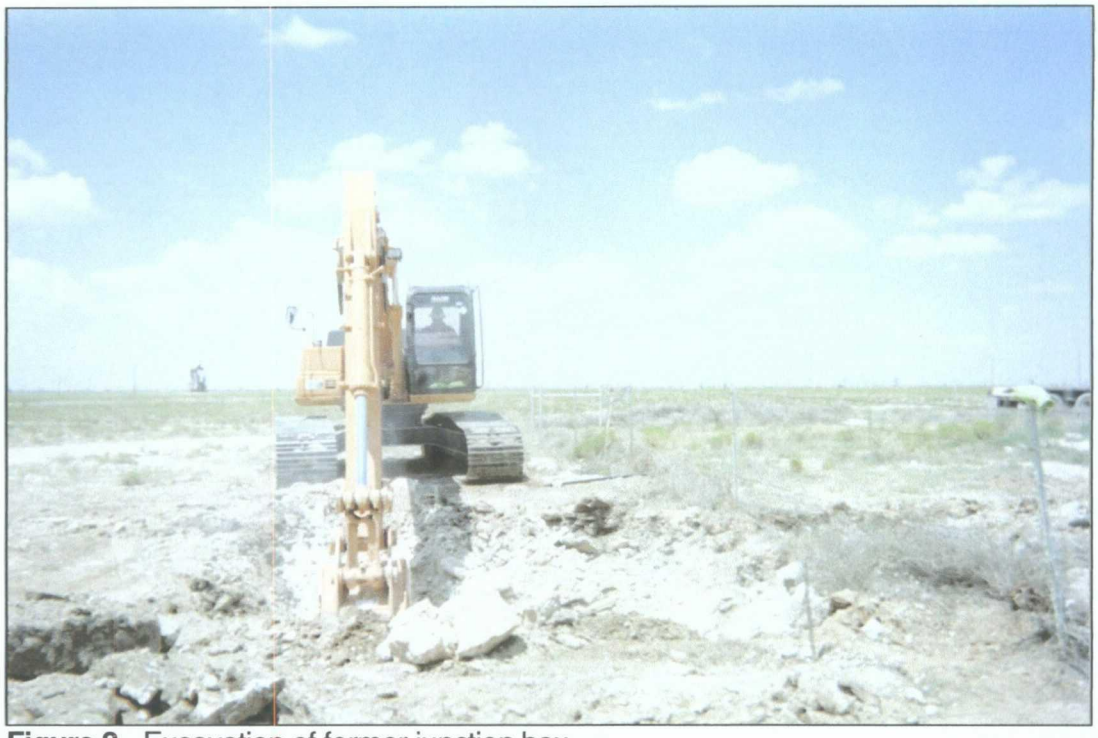


Figure 2 - Excavation of former junction box.

Figure 3 – Completed excavation.

Figure 4 – Installation and compaction of sub-surface clay layer (infiltration barrier).

Figure 5 – Preparing the surface and reseeding with native vegetation mix.

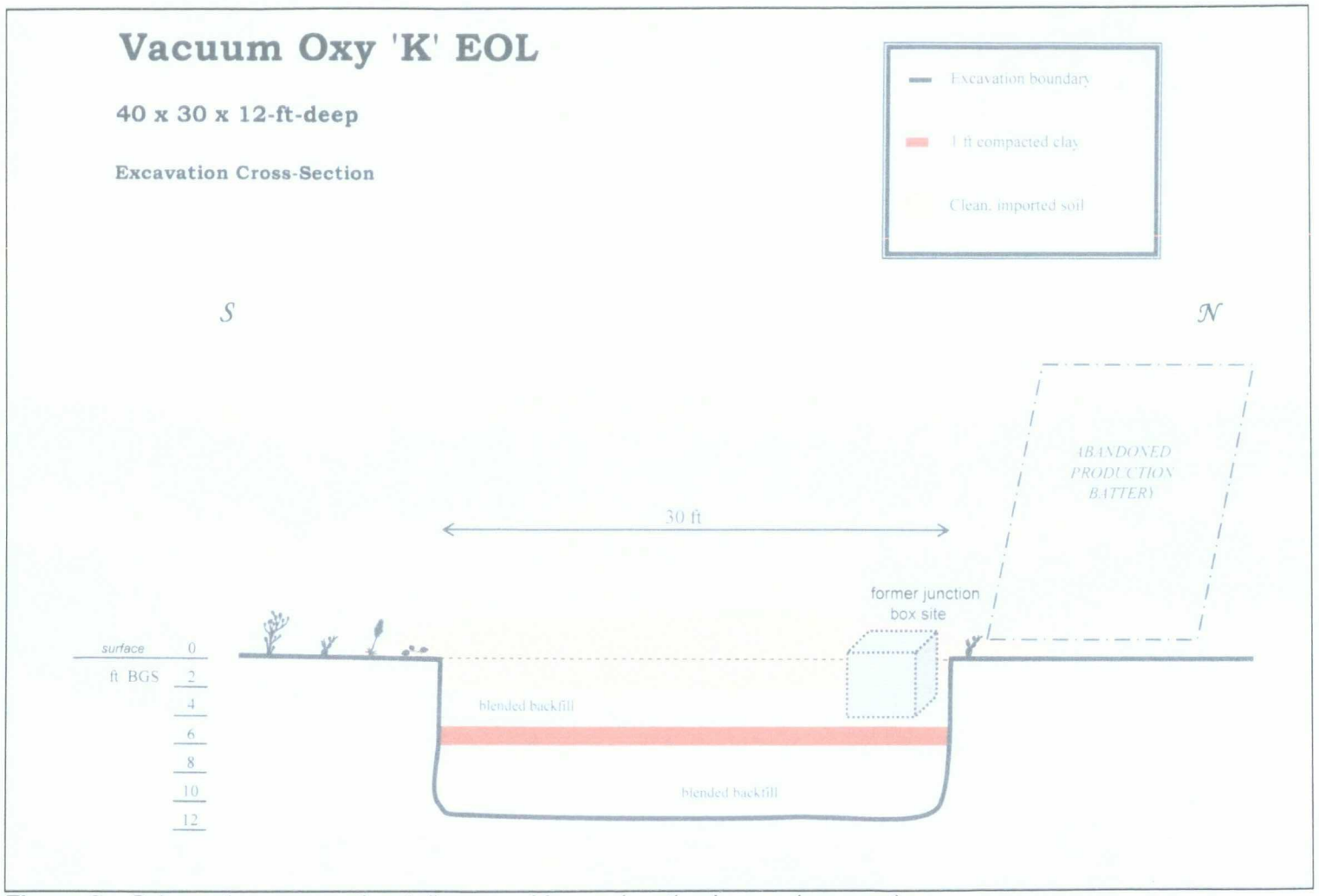


Figure 6 – Schematic cross sectional diagram of former junction box and excavation.

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	Oxy Phillips 'K' EOL	H	27	17S	35E	Lea	eliminated		

LAND TYPE: BLM ___ STATE X FEE LANDOWNER _____ OTHER _____

Depth to Groundwater 75 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 7/26/2005 Date Completed 4/20/2006 OCD Witness no

Soil Excavated 533 cubic yards Excavation Length 30 Width 40 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: **Sample Date** 9/20/2005 Sample Depth 12 ft

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chlorides mg/kg
4-WALL COMP.	0.0	<10.0	<10.0	851
BOTTOM COMP.	0.0	<10.0	<10.0	1910
BACKFILL	0.0	<10.0	<10.0	1060

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
4-wall comp.	n/a	803
bottom comp.	12'	2078
backfill comp.	n/a	746
vertical delineation trench at former junction (source)	3'	233
	4'	422
	5'	430
	6'	469
	7'	448
	8'	479
	9'	664
	10'	559
	11'	872
	12'	1539

General Description of Remedial Action: This junction box was eliminated during the pipeline/upgrade program. After the box was removed, an investigation was conducted using a backhoe to collect samples at regular intervals producing a 10x10x12-ft-deep hole. Chloride field tests were performed on each sample, which yielded elevated levels that did not relent with depth. Organic vapors were measured using a PID, which yielded low concentrations. Representative composite samples were sent to a commercial laboratory for analysis of chloride and TPH. The site was then excavated to a 30x40x12-ft-deep hole collecting soil samples at regular intervals. Chloride field tests yielded elevated levels of chloride that did not relent with depth. Organic vapors were measured using a PID, which yielded low concentrations. The excavated soil was blended on-site and returned to the excavation up to 6 ft below ground surface. At 6-5 ft BGS, a 1-ft-thick clay barrier was installed. The remaining fill was used to backfill the excavation to ground surface. An identification plate was placed on the surface at the former junction site to mark the presence of the clay below. Imported, clean top soil was used as a top cap and to contour to the surrounding area. On 4/24/2006, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. NMOCD was notified of potential groundwater impact on 8/7/2008.

ADDITIONAL EVALUATION IS MEDIUM PRIORITY

enclosures: photos, cross-section, lab results, PID screening, clay test, chloride curve

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SITE SUPERVISOR Roy Rascon SIGNATURE not available COMPANY RICE OPERATING COMPANY

REPORT ASSEMBLED BY Katie Jones INITIAL KJ

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr. DATE 8-8-08

*This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

Figure 7 – Junction Box Disclosure Report and summary of field chloride and petroleum hydrocarbon analyses.

Rice Operating Co	Project: Vacuum Oxy Phillips K-EOL	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	Reported:
Hobbs NM, 88240	Project Manager: Roy Rascon	09/26/05 16:58

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended Backfill (5122002-01) Soil									
Chloride	1060	20.0	mg/kg	40	EI52305	09/22/05	09/23/05	EPA 300.0	
% Moisture	7.7	0.1	%	1	EI52301	09/22/05	09/23/05	% calculation	
5 PT Bottom@ 12' (5122002-02) Soil									
Chloride	1910	25.0	mg/kg	50	EI52305	09/22/05	09/23/05	EPA 300.0	
% Moisture	7.8	0.1	%	1	EI52301	09/22/05	09/23/05	% calculation	
10'X10' 4 Wall Comp. (5122002-03) Soil									
Chloride	851	10.0	mg/kg	20	EI52305	09/22/05	09/23/05	EPA 300.0	
% Moisture	5.7	0.1	%	1	EI52301	09/22/05	09/23/05	% calculation	

Figure 8 – Laboratory chloride analyses of soil samples from representative locations as noted.

Rice Operating Co	Project: Vacuum Oxy Phillips K-E01	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	Reported:
Hobbs NM, 88240	Project Manager: Roy Rascon	09/26/05 16:58

Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended Backfill (5122002-01) Soil									
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EI52304	09/23/05	09/26/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		*73.6 %*	*70-130*		"	"	"	"	
Surrogate: 1-Chlorooctadecane		*92.6 %*	*70-130*		"	"	"	"	
5 PT Bottom@ 12' (5122002-02) Soil									
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EI52304	09/23/05	09/23/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		*88.0 %*	*70-130*		"	"	"	"	
Surrogate: 1-Chlorooctadecane		*94.4 %*	*70-130*		"	"	"	"	
10'X10' 4 Wall Comp. (5122002-03) Soil									
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EI52304	09/23/05	09/23/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		*90.2 %*	*70-130*		"	"	"	"	
Surrogate: 1-Chlorooctadecane		*94.0 %*	*70-130*		"	"	"	"	

Figure 9 – Laboratory petroleum hydrocarbon analyses of soil samples from representative locations as noted.