



AE Order Number Banner

Report Description

This report shows an AE Order Number in Barcode format for purposes of scanning. The Barcode format is Code 39.



App Number: pGRL0928153726

1RP - 2294

ENDEAVOR ENERGY RESOURCES, LP



SOUTH ENVIRONMENTAL SERVICES, INC.

P.O BOX 11064
MIDLAND, TEXAS 79702
OFFICE: (432) 682-3547
FAX: (432) 682-4182

September 9, 2010

Mr. Geoffrey Leking
Oil Conservations Division, District 1
1625 N. French Dr.
Hobbs, New Mexico 88240

Re: Remediation Work Plan
Peterson "C" Lease, Well No. 1 Leak Site, AIP: 30-041-20362,
Excavation and Remediation of Crude Impacted Soil
Roosevelt County, New Mexico

Mr. Leking,

South Environmental Services, Inc. (SES), on behalf of Endeavor Energy, Inc. (Endeavor Energy), is please to submit this Remediation Work Plan to the Oil Conservation Division of New Mexico (OCD) for the remediation of crude oil impacted soil at the above reference site.

Scope of Work

SES proposes that the following activities be completed to achieve compliance with Oil Conservation Division of New Mexico Statewide Rule for Total Petroleum Hydrocarbons (TPH) (<1,000 mg/kg), Chlorides (<500ppm), and Benzene (<50.0 mg/kg), as set out below:

- Mobilized SES personnel and equipment to the site,
- Excavate approximately 1,462 cubic yards of impacted soil down to clean bottom,
- Blend and treat with bio-enhancement nutrients and surfactants in onsite land farm stockpile on plastic app: 2' depth,
- Perform excavation bottom hole confirmation sampling event to verify remedial levels, TPH <1,000 mg/kg (ppm), Chlorides <500 mg/kg (ppm), and Benzene < 50 mg/kg (ppm),
- Backfill excavation areas with clean remediated soil, based on analytical verification meeting OCD requirements,
- Perform stockpile Characterization sampling event to verify attainment of remedial levels of TPH (<1,000 ppm), Chlorides (<500 ppm), and Benzene (<50 mg/kg),
- Preparation of a Site Remediation and Closure Report for submittal to the OCD, as required to resolve the enforcement action regulatory requirements as set out below.

Distribution of Hydrocarbons in Soil

The distribution of hydrocarbons in the unsaturated zone will be determined by utilizing the following techniques:

1. Visual observations of soil during trenching and/or excavation during remediation;
2. Visual observations of soil during the following excavation;
3. Visual observations of soil samples; and
4. Laboratory analyses of the above samples.

Following excavation of impacted soil, conformation soil samples will be collected from the base of the excavation, based on a minimum of one (1) discrete sample for each 500 square feet of surface feet of surface area. Following conformation sampling, any area still exhibiting TPH concentrations >1,000 mg/kg will be over-excavated and resample to confirm attainment of remedial goals. All samples will be submitted for laboratory analysis for TPH and/or BTEX, and Chlorides as referenced above.

QA/QC Procedures-Soil Sampling

Samples of subsurface and treated soils will be obtained utilizing proper EPA protocols and/or standards. Representative soil samples will be collected using clean, disposable gloves and clean sampling tools. The soil sample will then be placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container will be filled to capacity to limit the amount of head-space present. Each container will be labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler will be sealed for shipment to the laboratory. Proper chain-of-custody documentation will be maintained throughout the sampling and transportation process.

Soil samples will be delivered to Xenco Laboratories, The Environmental Lab of Odessa, Texas for TPH, Chlorides, and BTEX analysis using the methods described below. Soil samples will be analyzed for BTEX, TPH, and Chlorides within fourteen days following the collection date.

The soil samples were analyzed as follows:

1. BTEX concentrations in accordance with EPA Method 8021B.
2. TPH concentrations in accordance with modified SW-846.
3. Chlorides concentrations in accordance with EPA 300.1

The laboratory will be responsible for proper QA/QC procedures. These procedures will either be transmitted with the laboratory reports or on file at the laboratory.

Regulatory Reporting

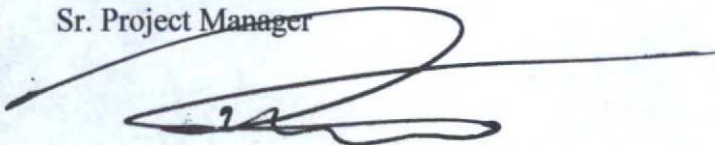
Following completion of the remedial actions, in compliance with the criteria set forth in Oil Conservation Division of New Mexico, South Environmental will develop and submit a Site Remediation and Closure Report to the OCD's office in Hobbs, New Mexico.

Upon OCD approval, the site will be restored as near as possible to the original site conditions.

Thank you for your assistance in this matter. If you have any questions or require additional information, please contact me at 432-425-8454.

Sincerely,
SOUTH ENVIRONMENTAL SERVICES, INC

Ronnie W. Nickell
Sr. Project Manager

A handwritten signature in black ink, appearing to read 'Ronnie W. Nickell', with a long horizontal line extending to the right.

Cc: Endeavor Energy, Inc., Midland, Texas

Analytical Report 387388

for
Endeavor Energy

Project Manager: Ronnie Nickell

Peterson C Well #1

31-AUG-10



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12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-10-6-TX), Arizona (AZ0738), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102)

Xenco-Atlanta (EPA Lab Code: GA00046):

Florida (E87429), North Carolina (483), South Carolina (98015), Utah (AALI1), West Virginia (362), Kentucky (85)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Miami (EPA Lab code: FL01152): Florida (E86678), Maryland (330)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)

Xenco-Corpus Christi (EPA Lab code: TX02613): Texas (T104704370)

Xenco-Boca Raton (EPA Lab Code: FL01273):

Florida(E86240),South Carolina(96031001), Louisiana(04154), Georgia(917)

North Carolina(444), Texas(T104704468-TX), Illinois(002295), Florida(E86349)

Xenco Phoenix (EPA Lab Code: AZ00901):

Arizona(AZ0757), California(06244CA), Texas(104704435-10-2), Nevada(NAC-445A), DoD(65816)

Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)



31-AUG-10

Project Manager: **Ronnie Nickell**
Endeavor Energy
110 N. Marienfeld, Suite 200

Midland, TX 79701

Reference: XENCO Report No: **387388**
Peterson C Well #1
Project Address: Roosevelt County, NM

Ronnie Nickell:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 387388. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 387388 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II

Odessa Laboratory Manager

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Sample Cross Reference 387388**Endeavor Energy, Midland, TX**

Peterson C Well #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
FL1-001	S	Aug-26-10 11:56	0 - 12 In	387388-001
FL2-001	S	Aug-26-10 12:05	0 - 12 In	387388-002
FL3-001	S	Aug-26-10 12:12	0 - 12 In	387388-003
FL4-001	S	Aug-26-10 12:25	0 - 12 In	387388-004
FL5-001	S	Aug-26-10 12:33	0 - 12 In	387388-005
FL6-001	S	Aug-26-10 12:36	0 - 12 In	387388-006



CASE NARRATIVE

Client Name: Endeavor Energy
Project Name: Peterson C Well #1



Project ID:
Work Order Number: 387388

Report Date: 31-AUG-10
Date Received: 08/27/2010

Sample receipt non conformances and Comments:

None

Sample receipt Non Conformances and Comments per Sample:

None

Analytical Non Conformances and Comments:

Batch: LBA-820668 Soil pH by EPA 9045C

None

Batch: LBA-820734 Percent Moisture

None

Batch: LBA-820781 TPH By SW8015 Mod

None

Batch: LBA-820841 Inorganic Anions by EPA 300/300.1

None

Batch: LBA-821086 BTEX by EPA 8021B
SW8021BM

Batch 821086, Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate.

Samples affected are: 387388-001, -005, -003, -002, -006, -004.

The Laboratory Control Sample for Toluene, m,p-Xylenes, Benzene, Ethylbenzene, o-Xylene is within laboratory Control Limits

SW8021BM

Batch 821086, Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene RPD was outside QC limits.

Samples affected are: 387388-001, -005, -003, -002, -006, -004

SW8021BM

Batch 821086, 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data not confirmed by re-analysis

Samples affected are: 387020-001 S, 387388-002, 387388-004, 387388-001.

Certificate of Analysis Summary 387388

Endeavor Energy, Midland, TX

Project Name: Peterson C Well #1

Project Id:

Contact: Ronnie Nickell

Project Location: Roosevelt County, NM

Date Received in Lab: Fri Aug-27-10 08:18 am

Report Date: 01-SEP-10

Project Manager: Brent Barron, II



Analysis Requested	Lab Id:	387388-001	387388-002	387388-003	387388-004	387388-005	387388-006
	Field Id:	FL1-001	FL2-001	FL3-001	FL4-001	FL5-001	FL6-001
	Depth:	0-12 In	0-12 In	0-12 In	0-12 In	0-12 In	0-12 In
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
TPH By SW8015 Mod	Sampled:	Aug-26-10 11:56	Aug-26-10 12:05	Aug-26-10 12:12	Aug-26-10 12:25	Aug-26-10 12:33	Aug-26-10 12:36
	Extracted:	Aug-27-10 11:00	Aug-27-10 11:00	Aug-27-10 11:00	Aug-27-10 11:00	Aug-27-10 11:00	Aug-27-10 11:00
	Analyzed:	Aug-27-10 13:44	Aug-27-10 14:03	Aug-27-10 14:23	Aug-27-10 14:43	Aug-27-10 15:02	Aug-27-10 15:22
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
C6-C12 Gasoline Range Hydrocarbons		743	2620	ND	664	402	ND
C12-C28 Diesel Range Hydrocarbons		5690	29900	157	10500	16000	153
C28-C35 Oil Range Hydrocarbons		131	1460	157	650	1070	153
Total TPH		6564	33980	157	11814	17472	153

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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 Brent Barron, II
 Odessa Laboratory Manager

Certificate of Analysis Summary 387388

Endavor Energy, Midland, TX
 Project Name: Peterson C Well #1

Project Id:
 Contact: Ronnie Nickell
 Project Location: Roosevelt County, NM

Date Received in Lab: Fri Aug-27-10 08:18 am

Report Date: 01-SEP-10

Project Manager: Brent Barron, II



Analysis Requested		Lab Id:	Field Id:	Depth:	Matrix:	Sampled:	387388-001	387388-002	387388-003	387388-004	387388-005	387388-006
			FL1-001	0-12 In	SOIL	Aug-26-10 11:56		FL2-001	FL3-001	FL4-001	FL5-001	FL6-001
								0-12 In	0-12 In	0-12 In	0-12 In	0-12 In
								SOIL	SOIL	SOIL	SOIL	SOIL
BTEX by EPA 8021B		Extracted:	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00	Aug-30-10 08:00
		Analyzed:	Aug-31-10 09:01	Aug-31-10 09:24	Aug-31-10 10:57	Aug-31-10 11:20	Aug-31-10 11:43	Aug-31-10 11:43	Aug-31-10 11:43	Aug-31-10 11:43	Aug-31-10 11:43	Aug-31-10 12:07
		Units/RL:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene			0.0014	0.0012	0.0029	0.0010	0.0011	0.0013	0.0010	0.0016	0.0010	ND
Toluene			0.0042	0.0024	0.1451	0.0021	ND	0.0049	0.0020	0.0026	0.0020	ND
Ethylbenzene			0.0154	0.0012	0.0677	0.0010	ND	0.0128	0.0010	0.0043	0.0010	ND
m,p-Xylenes			0.0771	0.0024	0.2841	0.0021	ND	0.0525	0.0020	0.0193	0.0020	ND
o-Xylene			0.1094	0.0012	0.3422	0.0010	ND	0.0912	0.0010	0.0053	0.0010	ND
Total Xylenes			0.1865	0.0012	0.6263	0.0010	ND	0.1437	0.0010	0.0246	0.0010	ND
Total BTEX			0.2075	0.0012	0.8420	0.0010	ND	0.1627	0.0010	0.0331	0.0010	ND
Inorganic Anions by EPA 300/300.1		Extracted:	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31
		Analyzed:	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31	Aug-27-10 09:31
		Units/RL:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Chloride			8.42	5.99	53.7	5.22	ND	26.5	5.10	583	10.2	ND
Percent Moisture		Extracted:	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09
		Analyzed:	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09	Aug-28-10 09:09
		Units/RL:	%	%	%	%	%	%	%	%	%	%
Percent Moisture			16.5	1.00	4.22	1.00	9.55	2.01	1.00	1.94	1.00	8.64
Soil pH by EPA 9045C		Extracted:	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11
		Analyzed:	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11	Aug-27-10 11:11
		Units/RL:	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU
pH			8.12	8.37	7.75	8.15	7.63	7.06				

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Brent Barron, II
 Odessa Laboratory Manager

Flagging Criteria

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the MQL and above the SQL.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

PQL Practical Quantitation Limit

* Outside XENCO's scope of NELAC Accreditation.

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5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
2505 North Falkenburg Rd, Tampa, FL 33619	(813) 620-2000	(813) 620-2033
5757 NW 158th St, Miami Lakes, FL 33014	(305) 823-8500	(305) 823-8555
12600 West I-20 East, Odessa, TX 79765	(432) 563-1800	(432) 563-1713
842 Cantwell Lane, Corpus Christi, TX 78408	(361) 884-0371	(361) 884-9116

Form 2 - Surrogate Recoveries

Project Name: Peterson C Well #1

Work Orders : 387388,

Project ID:

Lab Batch #: 821086

Sample: 572124-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/31/10 01:41

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0343	0.0300	114	80-120	
4-Bromofluorobenzene	0.0359	0.0300	120	80-120	

Lab Batch #: 821086

Sample: 572124-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/31/10 02:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	80-120	

Lab Batch #: 821086

Sample: 387020-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 03:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0327	0.0300	109	80-120	
4-Bromofluorobenzene	0.0372	0.0300	124	80-120	*

Lab Batch #: 821086

Sample: 387020-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 04:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0333	0.0300	111	80-120	
4-Bromofluorobenzene	0.0353	0.0300	118	80-120	

Lab Batch #: 821086

Sample: 387388-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 09:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0258	0.0300	86	80-120	
4-Bromofluorobenzene	0.0863	0.0300	288	80-120	*

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Peterson C Well #1

Work Orders : 387388,

Project ID:

Lab Batch #: 821086

Sample: 387388-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 09:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0336	0.0300	112	80-120	
4-Bromofluorobenzene	0.1278	0.0300	426	80-120	*

Lab Batch #: 821086

Sample: 387388-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 10:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0294	0.0300	98	80-120	
4-Bromofluorobenzene	0.0314	0.0300	105	80-120	

Lab Batch #: 821086

Sample: 387388-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 11:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.1647	0.0300	549	80-120	*

Lab Batch #: 821086

Sample: 387388-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 11:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0258	0.0300	86	80-120	

Lab Batch #: 821086

Sample: 387388-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/31/10 12:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0297	0.0300	99	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Peterson C Well #1

Work Orders : 387388,

Project ID:

Lab Batch #: 820781

Sample: 571907-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/27/10 12:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.0	99.8	95	70-135	
o-Terphenyl	55.5	49.9	111	70-135	

Lab Batch #: 820781

Sample: 571907-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/27/10 13:04

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.5	99.6	97	70-135	
o-Terphenyl	62.1	49.8	125	70-135	

Lab Batch #: 820781

Sample: 571907-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/27/10 13:24

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.2	100	99	70-135	
o-Terphenyl	54.2	50.1	108	70-135	

Lab Batch #: 820781

Sample: 387388-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/27/10 13:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.9	100	70-135	
o-Terphenyl	61.8	50.0	124	70-135	

Lab Batch #: 820781

Sample: 387388-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/27/10 14:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	100	101	70-135	
o-Terphenyl	50.8	50.0	102	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Peterson C Well #1

Work Orders : 387388,

Project ID:
Lab Batch #: 820781

Sample: 387388-003 / SMP

Batch: 1 **Matrix:** Soil

Units: mg/kg

Date Analyzed: 08/27/10 14:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.5	99.7	98	70-135	
o-Terphenyl	53.4	49.9	107	70-135	

Lab Batch #: 820781

Sample: 387388-004 / SMP

Batch: 1 **Matrix:** Soil

Units: mg/kg

Date Analyzed: 08/27/10 14:43

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.2	99.9	88	70-135	
o-Terphenyl	41.2	50.0	82	70-135	

Lab Batch #: 820781

Sample: 387388-005 / SMP

Batch: 1 **Matrix:** Soil

Units: mg/kg

Date Analyzed: 08/27/10 15:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.0	99.8	94	70-135	
o-Terphenyl	36.3	49.9	73	70-135	

Lab Batch #: 820781

Sample: 387388-006 / SMP

Batch: 1 **Matrix:** Soil

Units: mg/kg

Date Analyzed: 08/27/10 15:22

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.6	100	99	70-135	
o-Terphenyl	53.7	50.0	107	70-135	

Lab Batch #: 820781

Sample: 387390-003 S / MS

Batch: 1 **Matrix:** Soil

Units: mg/kg

Date Analyzed: 08/27/10 19:00

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.5	99.5	97	70-135	
o-Terphenyl	57.8	49.8	116	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

 Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Peterson C Well #1

Work Orders : 387388,

Lab Batch #: 820781

Sample: 387390-003 SD / MSD

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/27/10 19:19

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	99.5	104	70-135	
o-Terphenyl	53.1	49.8	107	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Project Name: Peterson C Well #1

Work Order #: 387388

Project ID:

Lab Batch #: 821086

Sample: 572124-1-BKS

Matrix: Solid

Date Analyzed: 08/31/2010

Date Prepared: 08/30/2010

Analyst: ASA

Reporting Units: mg/kg

Batch #: 1

BLANK /BLANK SPIKE RECOVERY STUDY

BTEX by EPA 8021B	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Analytes						
Benzene	ND	0.0996	0.0898	90	70-130	
Toluene	ND	0.0996	0.0882	89	70-130	
Ethylbenzene	ND	0.0996	0.0918	92	71-129	
m,p-Xylenes	ND	0.1992	0.1791	90	70-135	
o-Xylene	ND	0.0996	0.0918	92	71-133	

Blank Spike Recovery [D] = $100 * [C] / [B]$

All results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

Project Name: Peterson C Well #1
Work Order #: 387388
Analyst: LATCOR
Lab Batch ID: 820841
Sample: 820841-1-BKS
Date Prepared: 08/27/2010
Batch #: 1
Project ID:
Date Analyzed: 08/27/2010
Matrix: Solid
Units: mg/kg

Units: mg/kg											
BLANK/BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY											
Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	ND	10.0	9.98	100	10	10.3	103	3	80-120	20	

Analyst: BEV
Lab Batch ID: 820781
Sample: 571907-1-BKS
Date Prepared: 08/27/2010
Batch #: 1
Date Analyzed: 08/27/2010
Matrix: Solid
Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY											
Units: mg/kg											
Analytes	TPH By SW8015 Mod										
	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	ND	998	1030	103	996	1040	104	1	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	998	1000	100	996	1010	101	1	70-135	35	

 Relative Percent Difference $RPD = 200 * [(C-F) / (C+F)]$

 Blank Spike Recovery $[D] = 100 * (C/[B])$

 Blank Spike Duplicate Recovery $[G] = 100 * (F/[E])$

All results are based on MDL and Validated for QC Purposes

Project Name: Peterson C Well #1

Work Order #: 387388

Lab Batch #: 820841

Date Analyzed: 08/27/2010

QC- Sample ID: 387262-001 S

Reporting Units: mg/kg

Date Prepared: 08/27/2010

Batch #: 1

Project ID:

Analyst: LATCOR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	171	201	366	97	80-120	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$
 Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$
 All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Project Name: Peterson C Well #1

Work Order # : 387388

Lab Batch ID: 821086

Date Analyzed: 08/31/2010

Reporting Units: mg/kg

Project ID:

QC- Sample ID: 387020-001 S

Date Prepared: 08/30/2010

Batch #:

Analyst: ASA

Matrix: Soil

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Analytes	BTEX by EPA 8021B										
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	ND	0.1114	0.0350	31	0.1125	0.0618	55	55	70-130	35	XF
Toluene	ND	0.1114	0.0328	29	0.1125	0.0580	52	56	70-130	35	XF
Ethylbenzene	ND	0.1114	0.0305	27	0.1125	0.0547	49	57	71-129	35	XF
m,p-Xylenes	ND	0.2227	0.0681	31	0.2250	0.1150	51	51	70-135	35	XF
o-Xylene	ND	0.1114	0.0355	32	0.1125	0.0569	51	46	71-133	35	XF

Lab Batch ID: 820781

Date Analyzed: 08/27/2010

Reporting Units: mg/kg

QC- Sample ID: 387390-003 S

Date Prepared: 08/27/2010

Matrix: Soil

Batch #:

Analyst: BEV

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod											
Analytes											
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	ND	1330	1420	107	1330	1480	111	4	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1330	1370	103	1330	1420	107	4	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

Project Name: Peterson C Well #1

Work Order #: 387388

Lab Batch #: 820841

Date Analyzed: 08/27/2010

QC- Sample ID: 387262-001 D

Reporting Units: mg/kg

Project ID:

Analyst: LATCOR

Matrix: Soil

Date Prepared: 08/27/2010

Batch #: 1

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	171	175	2	20	

Lab Batch #: 820734

Date Analyzed: 08/28/2010

QC- Sample ID: 387388-001 D

Reporting Units: %

Date Prepared: 08/28/2010

Batch #: 1

Analyst: JLG

Matrix: Soil

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Percent Moisture	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Percent Moisture	16.5	15.4	7	20	

Lab Batch #: 820668

Date Analyzed: 08/27/2010

QC- Sample ID: 387388-001 D

Reporting Units: SU

Date Prepared: 08/27/2010

Batch #: 1

Analyst: JLG

Matrix: Soil

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Soil pH by EPA 9045C	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
pH	8.12	8.13	0	20	

Spike Relative Difference RPD $200 * |(B-A)/(B+A)|$

All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

Xenco Laboratories

The Environmental Lab of Texas

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-663-1800
Fax: 432-663-1713

Project Manager:

Ronnie Nickell

Project Name:

Robert Peterson C Well #1

Company Name

Endavor

Project #:

001

Company Address:

Midland, TX

Project Loc: Roswell County, NM

City/State/Zip:

Midland, TX

PO #:

001

Telephone No:

806-735-1111

Fax No:

806-735-1111

Report Format:

☒ Standard

☐ TRRP

☐ NPDES

Sampler Signature:

Robert Peterson

e-mail:

ronnie@xencolab.com

(lab use only)

ORDER # 38738

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled	Field Filtered	Total #. of Containers	Ice	HNO ₃	HCl	H ₂ SO ₄	NaOH	Na ₂ S ₂ O ₃	None	Other (Specify)	DW=Drinking Water SL=Sludge	GW=Groundwater S=Soil/Solid	NP=Non-Potable Specify Other	TPH: 418.1	TPH: TX 1005	Cations (Ca, Mg, Na, K)	Anions (Cl, SO ₄ , Alkalinity)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX (E021B/030 or BTEX 8260)	RCI	N.O.R.M.	RUSH TAT (Pre-Schedule) 24, 48, 72 hrs	Standard TAT
1	FL1-001	0'	12"	8-26-16	11:55am		4029																								
2	FL2-001				12:05pm																										
3	FL3-001				12:12pm																										
4	FL4-001				12:26pm																										
5	FL5-001				12:33pm																										
6	FL6-001				12:36pm																										

Special Instructions:

Relinquished by:

James Lee Ayers

Date

Time

Received by:

Date

Time

Relinquished by:

James Lee Ayers

Date

Time

Received by:

Date

Time

Relinquished by:

James Lee Ayers

Date

Time

Received by:

Date

Time



XENCO Laboratories
Atlanta, Boca Raton, Corpus Christi, Dallas
Houston, Miami, Odessa, Philadelphia
Phoenix, San Antonio, Tampa

Document Title: Sample Receipt Checklist
Document No.: SYS-SRC
Revision/Date: No. 01, 5/27/2010
Effective Date: 6/1/2010 Page 1 of 1

Prelogin / Nonconformance Report - Sample Log-In

Client: Endeavor
Date/Time: 08-27-10 @ 0813
Lab ID #: 382388
Initials: JMF

Sample Receipt Checklist

1. Samples on ice?	Blue	<u>Water</u>	No	
2. Shipping container in good condition?	<u>Yes</u>	No	None	
3. Custody seals intact on shipping container (cooler) and bottles?	Yes	No	<u>N/A</u>	
4. Chain of Custody present?	<u>Yes</u>	No		
5. Sample instructions complete on chain of custody?	<u>Yes</u>	No		
6. Any missing / extra samples?	Yes	<u>No</u>		
7. Chain of custody signed when relinquished / received?	<u>Yes</u>	No		
8. Chain of custody agrees with sample label(s)?	Yes	No		<u>id on label</u>
9. Container labels legible and intact?	Yes	No		<u>11</u>
10. Sample matrix / properties agree with chain of custody?	<u>Yes</u>	No		
11. Samples in proper container / bottle?	<u>Yes</u>	No		
12. Samples properly preserved?	<u>Yes</u>	No	N/A	
13. Sample container intact?	<u>Yes</u>	No		
14. Sufficient sample amount for indicated test(s)?	<u>Yes</u>	No		
15. All samples received within sufficient hold time?	<u>Yes</u>	No		
16. Subcontract of sample(s)?	Yes	<u>No</u>	N/A	
17. VOC sample have zero head space?	<u>Yes</u>	No	N/A	
18. Cooler 1 No.	Cooler 2 No.	Cooler 3 No.	Cooler 4 No.	Cooler 5 No.
lbs 5.1 °C	lbs °C	lbs °C	lbs °C	lbs °C

Nonconformance Documentation

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

Regarding: _____

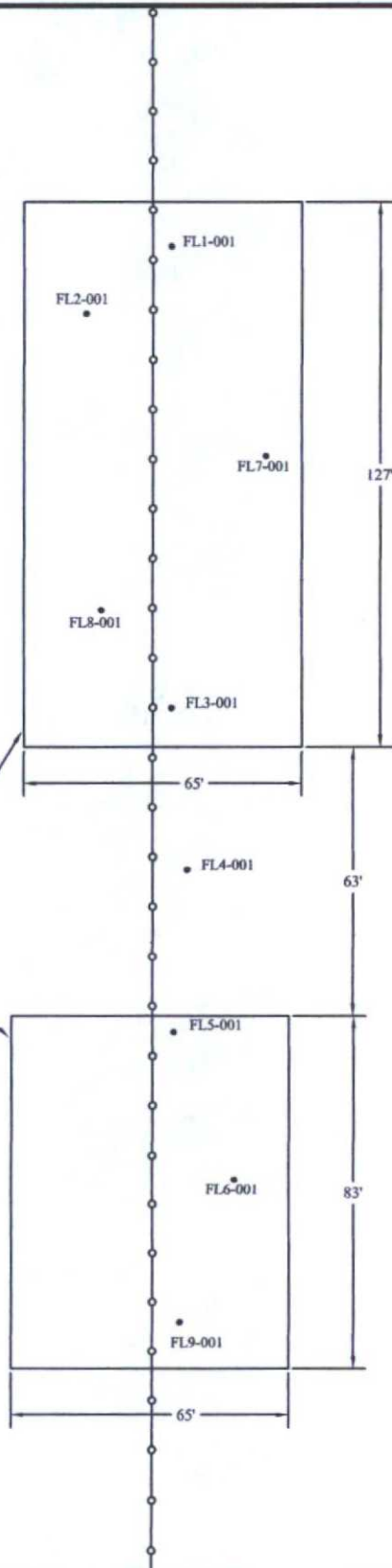
Corrective Action Taken: _____

Check all that apply: ☐ Cooling process has begun shortly after sampling event and out of temperature condition acceptable by NELAC 5.5.8.3.1.a.1.
☐ Initial and Backup Temperature confirm out of temperature conditions
☐ Client understands and would like to proceed with analysis

DRAFT



Heavily Stained Area



Peterson C Well #1	Endeavor Energy
Roosevelt County, New Mexico	
Drawn By: JDJ	Rev: A-2
August 31, 2010	Scale: 1" = 40'

Figure 1
Aerial Map



South Environmental Services, Inc.