Souder, Miller & Associates♦201 S. Halagueno St.♦Carlsbad, NM 88220
(575) 689-8801

APPROVED
By Olivia Yu at 11:00 am, Sep 14, 2018

May 29, 2018

#5E27122-BG5

NMOCD grants closure to 1RP-4776.

NMOCD District I
Olivia Yu
1625 N French Dr
Hobbs, NM 88240

SUBJECT: SOIL REMEDIATION CLOSURE REPORT FOR THE ABE UNIT #2 (2RP-4776), LEA COUNTY, NEW MEXICO

Dear Ms. Yu:

On behalf of Marathon Oil Company (Marathon), Souder, Miller & Associates (SMA) has prepared this CLOSURE REPORT that describes the assessment, and initial remediation for a release associated with the Abe Unit #2. The site is in UNIT H, SECTION 29, TOWNSHIP 21S, RANGE 33E, NMPM, Lea County, New Mexico, on State land. Figure 1 illustrates the vicinity and location of the site. Table 1, below, summarizes information regarding the release.

Table 1: Release information and Site Ranking

Name	Abe Unit #2
Company	Marathon Oil Company
Incident Number	1RP-4776
API Number	30-025-34146
Location	32.45256, -103.58819
Estimated Date of Release	7/17/2017
Date Reported to NMOCD	7/21/2017
Land Owner	State
Reported To	NMOCD District I
Source of Release	Flare Stack
Released Material	gas line fluids
Released Volume	unknown
Recovered Volume	unknown
Net Release	unknown
Nearest Waterway	an unnamed playa is 4.5 miles northeast of the location
Depth to Groundwater	Estimated to be greater than 100 feet
Nearest Domestic Water Source	Greater than 1,000 feet
NMOCD Ranking	0
SMA Response Dates	5/7/2018

1.0 Background

Due to equipment failure, liquids built up in the gas line. Liquids then traveled to the flare and caused a fire. The surface impact was approximately 60 feet wide and 150 feet long around the flare stack.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 25 miles west of Eunice, with an elevation of approximately 3,710 feet above sea level. SMA searched the New Mexico State Engineer's Office (NMOSE) online water well database for water wells in the vicinity of the release. Several wells are located within a three-mile radius of the site. After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to be greater than 100 feet below ground surface (bgs).

Recommended Remediation Action Levels (RRALs) are determined by the site ranking according to the NMOCD *Guidelines for Remediation of Leaks, Spills, and Releases* (1993). Below in Table 2 are the remediation standards and the site ranking for this location. Justification for this site ranking is found in Figure 1 and Appendix B.

Table 2.

Soil Remediation Standards	0 to 9	10 to 19	>19
Benzene	10 PPM	10 PPM	10 PPM
BTEX	50 PPM	50 PPM	50 PPM
TPH	5000 PPM	1000 PPM	100 PPM

Depth to Groundwater	NMOCD Numeric Rank
< 50 BGS = 20	
50' to 99' = 10	
>100' = 0	0
Distance to Nearest Surface Water	**NMOCD Numeric Rank**
< 200' = 20	
200' - 1000' = 10	
>1000' = 0	0
Well Head Protection	**NMOCD Numeric Rank**
<1000' (or <200' domestic) = 20	
> 1000' = 0	0
Total Site Ranking	**0**

3.0 Release Characterization

During emergency response actions, Marathon operations removed impacted soils and vegetation. On May 7, 2018, SMA field personnel assessed the release and effectiveness of remedial actions. Samples from four locations in the impacted area were collected at 6 inches bgs. All samples were collected and processed according to NMOCD soil sampling procedures. The samples were sent under chain-of-custody protocols to Hall Environmental Analysis Laboratory for analysis for MRO, DRO, and GRO by EPA Method 8015D, BTEX by EPA Method 8021, and Chlorides by Method 300. Sample

locations are depicted on Figure 2. All laboratory results are summarized in Table 3. Laboratory reports are included in Appendix C.

All samples returned chloride concentrations below laboratory detection limits, and hydrocarbons below laboratory detection limits, or below NMOCD RRALs.

4.0 Soil Remediation Summary

Sampling performed by SMA indicates that initial actions taken by Marathon effectively removed contaminated soils to within NMOCD RRAL's. No further action is recommended at this time.

5.0 Scope and Limitations

The scope of our services consisted of the performance of assessment sampling, verification of release stabilization, regulatory liaison, and preparation of this closure report. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact either Austin Weyant at 575-689-8801 or Shawna Chubbuck at 505-325-7535.

Submitted by:
SOUDER, MILLER & ASSOCIATES

Austin Weyant
Project Scientist

Reviewed by:

Shawna Chubbuck
Senior Scientist

ATTACHMENTS:

Figures:

Figure 1: Vicinity and Well Head Protection Map
Figure 2: Site and Sample Location Map

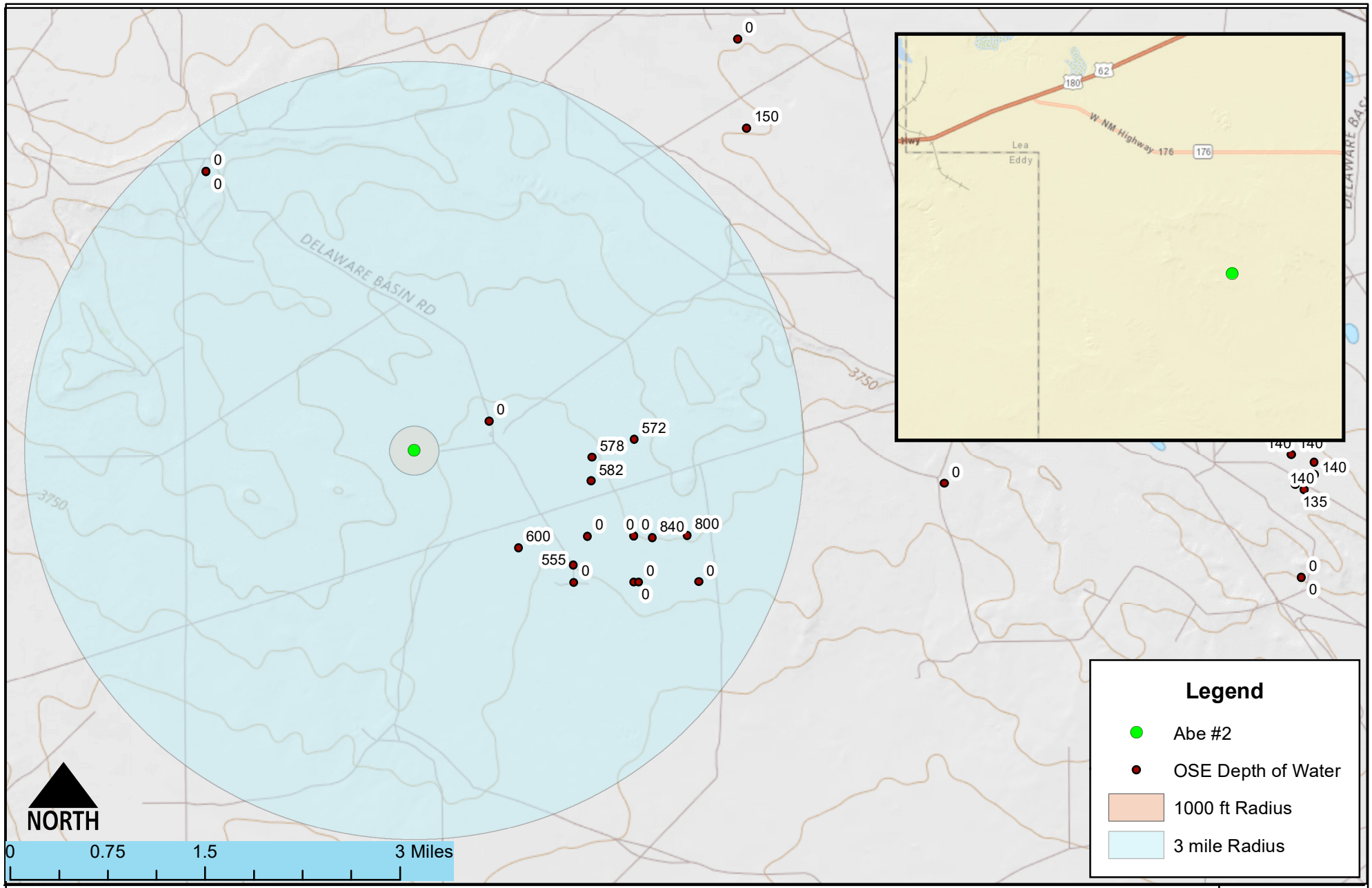
Tables:

Table 3: Summary of Sample Results

Appendices:

Appendix A: Form C141 Initial and Final
Appendix B: NMOSE Wells Report
Appendix C: Laboratory Analytical Reports

FIGURE 1
VICINITY AND NMOSE DATA MAP



Vicinity and Well Head Protection Map
Abe #2 - Marathon
S 29-T21S-R33E, New Mexico

Figure 1

Date Saved: 5/10/2018

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Heather Patterson
Checked
Approved

SMA
201 South Halagueña Street
Carlsbad, New Mexico 88221
(575) 689-7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

FIGURE 2
SITE AND SAMPLE LOCATION MAP

Site and Sample Location Map
Abe #2 - Marathon
S 29-T21S-R33E, New Mexico

Figure 2

Date Saved: 5/10/2018

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Heather Patterson
Checked
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TABLE 3
SUMMARY SAMPLE RESULTS

Abe Unit #2

Table 3.

Sample Number on Figure 2	Sample Date	Depth (feet bgs)	Action Taken	BTEX mg/Kg	Benzene mg/Kg	GRO mg/Kg	DRO mg/Kg	MRO mg/Kg	**Total TPH** mg/Kg	Cl- Laboratory mg/Kg
NMOCD RRAL's for Site Ranking 0				50 mg/Kg	10 mg/Kg				5000 mg/Kg	
L1	5/7/2018	0.5	in-situ	<0.21	<0.023	<4.6	<9.9	<50	<65	<30
L2	5/7/2018	0.5	in-situ	<0.21	<0.023	<4.7	<9.9	<49	<64	<30
L3	5/7/2018	0.5	in-situ	<0.21	<0.024	<4.7	110	140	250	<30
L4	5/7/2018	0.5	in-situ	<0.21	<0.025	<4.9	880	760	1640	<30

"--" = Not Analyzed

APPENDIX A
FORM C141 INITIAL AND FINAL

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Marathon Oil Company	Contact Wendy Gram
Address 5555 San Felipe Street, Houston, Texas 77056	Telephone No. 701-690-6519 (cell) 713-296-2862 (office)
Facility Name Abe Unit #2	Facility Type Gas well

Surface Owner State	Mineral Owner State of New Mexico	API No. 30-025-34146

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
H	29	21S	33E	1650	North	660	East	Lea

Latitude 32.4525604 **Longitude** -103.5881958 NAD83

NATURE OF RELEASE

Type of Release Spill/Fire	Volume of Release Unknown	Volume Recovered Unknown
Source of Release Flare	Date and Hour of Occurrence 7/17/2017	Date and Hour of Discovery 7/20/2017 2:48 PM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu with NMOCD and Shelly Tucker with BLM	
By Whom? Wendy Gram	Date and Hour 7/21/2017 7:21 AM CDST	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*
Not applicable.

RECEIVED
By Olivia Yu at 1:17 pm, Aug 04, 2017

Describe Cause of Problem and Remedial Action Taken.*
Impacted area 60 feet by 150 feet and 1 to 3 inches of penetration. Incident is still under investigation. Some failure in the heater treater (exact cause not yet determined) caused liquids to build up in the gas sales line which became blocked. Liquids then traveled to the flare and subsequently created burned vegetation. Well is a gas well and does not produce much liquids according to production history.

Describe Area Affected and Cleanup Action Taken.*
Removed impacted soils and vegetation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Wendy Gram Signature:	OIL CONSERVATION DIVISION Approved by Environmental Specialist:	
Printed Name: Wendy Gram		
Title: Sr. HES Professional	Approval Date: 8/4/2017	Expiration Date:
E-mail Address: wwgram@marathonoil.com	Conditions of Approval: see attached directive	Attached ☑
Date: August 1, 2017 Phone: 701-690-6519 (cell) 713-296-2862 (office)		

* Attach Additional Sheets If Necessary

1RP-4776

nOY1721648204

pOY1721648543

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _8/1/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4776__ has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before _9/4/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

● Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

● Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

● Nominal detection limits for field and laboratory analyses must be provided.

● Composite sampling is not generally allowed.

● Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

●Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

● If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

● Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

APPENDIX B
NMOSE WELLS REPORT

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00601 POD1	CP	LE		2	1	28	21S	33E	633502	3591791*	819	223		
CP 00854 POD1	CP	LE	1	1	2	33	21S	33E	633879	3590223	1708	950	600	350
CP 01357 POD1	CP	LE	4	3	1	27	21S	33E	634782	3591347	2049	1286	578	708
CP 01355 POD1	CP	LE	2	1	3	27	21S	33E	634773	3591061	2080	1192	582	610
CP 01356 POD1	CP	LE	4	2	2	33	21S	33E	634560	3590014	2347	1098	555	543
CP 01349 POD1	CP	LE	2	3	1	27	21S	33E	635304	3591576	2567	1188	572	616
CP 01411 POD2	CP	LE		1	2	34	21S	33E	635534	3590380	3010	1125		
CP 01411 POD1	CP	LE		2	2	34	21S	33E	635968	3590386	3415	1149		
CP 00794 POD1	CP	LE	4	1	1	18	21S	33E	629976	3594865*	4357	160		
CP 00795 POD1	CP	LE	4	1	1	18	21S	33E	629976	3594865*	4357	170		

Average Depth to Water: **577 feet**

Minimum Depth: **555 feet**

Maximum Depth: **600 feet**

Record Count: 10

UTMNAD83 Radius Search (in meters):

Easting (X): 632737.81 **Northing (Y):** 3591494.47 **Radius:** 5000

***UTM location was derived from PLSS - see Help**

APPENDIX C

LABORATORY ANALYTICAL REPORTS

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 18, 2018

Austin Weyant
Souder, Miller & Associates
201 S Halagueno
Carlsbad, NM 88221
TEL: (575) 689-7040
FAX

RE: Abe 2 OrderNo.: 1805566

Dear Austin Weyant:

Hall Environmental Analysis Laboratory received 4 sample(s) on 5/9/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1805566**
Date Reported: **5/18/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: L1-0.5
Project: Abe 2
Collection Date: 5/7/2018 1:57:00 PM
Lab ID: 1805566-001 **Matrix:** SOIL **Received Date:** 5/9/2018 9:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/15/2018 11:47:44 PM	38135
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/17/2018 10:32:40 AM	38089
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/17/2018 10:32:40 AM	38089
Surr: DNOP	107	70-130		%Rec	1	5/17/2018 10:32:40 AM	38089
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Surr: BFB	84.9	15-316		%Rec	1	5/12/2018 7:04:41 AM	38051
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Methyl tert-butyl ether (MTBE)	ND	0.093		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Benzene	ND	0.023		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Toluene	ND	0.046		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Ethylbenzene	ND	0.046		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Xylenes, Total	ND	0.093		mg/Kg	1	5/12/2018 7:04:41 AM	38051
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	5/12/2018 7:04:41 AM	38051

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: L2-0.5
Project: Abe 2
Collection Date: 5/7/2018 2:00:00 PM
Lab ID: 1805566-002
Matrix: SOIL
Received Date: 5/9/2018 9:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/16/2018 12:49:47 AM	38135
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/17/2018 10:56:36 AM	38089
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/17/2018 10:56:36 AM	38089
Surr: DNOP	100	70-130		%Rec	1	5/17/2018 10:56:36 AM	38089
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Surr: BFB	86.1	15-316		%Rec	1	5/12/2018 7:28:18 AM	38051
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Methyl tert-butyl ether (MTBE)	ND	0.093		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Benzene	ND	0.023		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Toluene	ND	0.047		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Ethylbenzene	ND	0.047		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Xylenes, Total	ND	0.093		mg/Kg	1	5/12/2018 7:28:18 AM	38051
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	5/12/2018 7:28:18 AM	38051

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: L3-0.5
Project: Abe 2
Collection Date: 5/7/2018 2:04:00 PM
Lab ID: 1805566-003 **Matrix:** SOIL **Received Date:** 5/9/2018 9:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/16/2018 1:02:12 AM	38135
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	110	9.9		mg/Kg	1	5/17/2018 11:20:34 AM	38089
Motor Oil Range Organics (MRO)	140	49		mg/Kg	1	5/17/2018 11:20:34 AM	38089
Surr: DNOP	106	70-130		%Rec	1	5/17/2018 11:20:34 AM	38089
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Surr: BFB	85.7	15-316		%Rec	1	5/12/2018 7:51:48 AM	38051
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Methyl tert-butyl ether (MTBE)	ND	0.095		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Benzene	ND	0.024		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Toluene	ND	0.047		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Ethylbenzene	ND	0.047		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Xylenes, Total	ND	0.095		mg/Kg	1	5/12/2018 7:51:48 AM	38051
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	5/12/2018 7:51:48 AM	38051

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: L4-0.5
Project: Abe 2
Collection Date: 5/7/2018 2:07:00 PM
Lab ID: 1805566-004 **Matrix:** SOIL **Received Date:** 5/9/2018 9:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/16/2018 1:14:36 AM	38135
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	880	9.9		mg/Kg	1	5/17/2018 11:44:25 AM	38089
Motor Oil Range Organics (MRO)	760	50		mg/Kg	1	5/17/2018 11:44:25 AM	38089
Surr: DNOP	121	70-130		%Rec	1	5/17/2018 11:44:25 AM	38089
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Surr: BFB	99.2	15-316		%Rec	1	5/12/2018 8:15:18 AM	38051
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Methyl tert-butyl ether (MTBE)	ND	0.099		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Benzene	ND	0.025		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Toluene	ND	0.049		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Ethylbenzene	ND	0.049		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Xylenes, Total	ND	0.099		mg/Kg	1	5/12/2018 8:15:18 AM	38051
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	5/12/2018 8:15:18 AM	38051

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1805566**

18-May-18

Client: Souder, Miller & Associates

Project: Abe 2

Sample ID	**MB-38135**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**38135**	RunNo:	**51301**					
Prep Date:	**5/15/2018**	Analysis Date:	**5/15/2018**	SeqNo:	**1667780**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-38135**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**38135**	RunNo:	**51301**					
Prep Date:	**5/15/2018**	Analysis Date:	**5/15/2018**	SeqNo:	**1667781**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.1	90	110			

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1805566**

18-May-18

Client: Souder, Miller & Associates

Project: Abe 2

Sample ID **1805566-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **L1-0.5**	Batch ID: **38089**	RunNo: **51331**
Prep Date: **5/14/2018**	Analysis Date: **5/17/2018**	SeqNo: **1669944** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	9.9	49.26	4.404	87.6	55.8	125			
Surr: DNOP	5.2		4.926		106	70	130			

Sample ID **1805566-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **L1-0.5**	Batch ID: **38089**	RunNo: **51331**
Prep Date: **5/14/2018**	Analysis Date: **5/17/2018**	SeqNo: **1669945** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.9	49.41	4.404	93.0	55.8	125	5.76	20	
Surr: DNOP	5.4		4.941		108	70	130	0	0	

Sample ID **LCS-38089**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **38089**	RunNo: **51331**
Prep Date: **5/14/2018**	Analysis Date: **5/17/2018**	SeqNo: **1669950** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	97.5	70	130			
Surr: DNOP	5.1		5.000		102	70	130			

Sample ID **MB-38089**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **38089**	RunNo: **51331**
Prep Date: **5/14/2018**	Analysis Date: **5/17/2018**	SeqNo: **1669951** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		100	70	130			

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1805566**

18-May-18

Client: Souder, Miller & Associates

Project: Abe 2

Sample ID	**MB-38051**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**38051**	RunNo:	**51207**					
Prep Date:	**5/10/2018**	Analysis Date:	**5/11/2018**	SeqNo:	**1664656**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	900		1000		89.8	15	316			

Sample ID	**LCS-38051**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**38051**	RunNo:	**51207**					
Prep Date:	**5/10/2018**	Analysis Date:	**5/11/2018**	SeqNo:	**1664657**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	104	75.9	131			
Surr: BFB	1100		1000		109	15	316			

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1805566**

18-May-18

Client: Souder, Miller & Associates

Project: Abe 2

Sample ID **MB-38051**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **38051**	RunNo: **51207**
Prep Date: **5/10/2018**	Analysis Date: **5/11/2018**	SeqNo: **1664717** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10								
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		110	80	120			

Sample ID **LCS-38051**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **38051**	RunNo: **51207**
Prep Date: **5/10/2018**	Analysis Date: **5/11/2018**	SeqNo: **1664718** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.94	0.10	1.000	0	94.5	70.1	121			
Benzene	0.95	0.025	1.000	0	95.1	77.3	128			
Toluene	0.98	0.050	1.000	0	98.2	79.2	125			
Ethylbenzene	0.97	0.050	1.000	0	96.8	80.7	127			
Xylenes, Total	3.0	0.10	3.000	0	98.9	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		110	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: SMA-CARLSBAD | Work Order Number: 1805566 | RcptNo: 1

Received By: Michelle Garcia 5/9/2018 9:50:00 AM Michelle Garcia

Completed By: Michelle Garcia 5/10/2018 8:55:20 AM Michelle Garcia

Reviewed By: LB 5/10

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 10 (<2 or >12 unless noted)
Adjusted? 5/10
Checked by:

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.9	Good	Yes			

Chain-of-Custody Record

Client:

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:

Project #:

Project Manager:

Sampler:

On Ice: ☑ Yes ☐ No

Sample Temperature:

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
5/7/18		Soil	21-05			001
						002
						003
			6'-6.5			004

Date	Time	Relinquished by:	Received by:	Date	Time
Date	Time	Relinquished by:	Received by:	Date	Time
				05/09/18	0950

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					
X		X					X								
X		X					X								
X		X					X								
X		X					X								

Remarks: