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: pVF1726437775

3RP - 1054

WILLIAMS FOUR CORNERS, LLC

9/21/2017

3R-1054

Williams
Lowery Tank Battery

Remediation Plans

September 2017

79

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

OIL CONS. DIV DIST. 3
SEP 18 2017

Form C-141
Revised August 8, 2011
Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report (Subsequent) ☐ Final Report

Name of Company Williams Four Corners LLC	Contact Aaron Galer
Address 1755 Arroyo Drive, Bloomfield, NM 87413	Telephone No. 505-584-6746
Facility Name Lowery Tank Battery	Facility Type Storage Tank

Surface Owner State of New Mexico Lands	Mineral Owner	API No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
I	16	26N	6W					Rio Arriba

Latitude 36.484182° N **Longitude** 107.465462° W

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release Unknown	Volume Recovered Unknown
Source of Release Below-grade tank	Date and Hour of Occurrence 03/26/2013; 9:00 AM	Date and Hour of Discovery 03/26/2013; 9:00 AM
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
During removal/replacement of a below-grade tank from the location, hydrocarbon impacted soils were encountered. An investigation of the area beneath the below-grade tank was performed to determine the extent of hydrocarbon impacts. No remedial action has taken place at the location. The replacement below-grade tank has not been installed at this time.

9/12/2017 Update: Please see the attached Remediation Plan and Conditions of Approval, as requested.

Describe Area Affected and Cleanup Action Taken.*
The investigation findings are documented in the attached Investigation Report. Additional actions are proposed as documented in the attached Supplemental Site Investigation & Corrective Action Work Plan. It should be noted that groundwater was not encountered during the investigation.

9/12/2017 Update: Please see the attached Remediation Plan and Conditions of Approval, as requested.

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.

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Mitch Morris	Approved by Environmental Specialist:	
Title: Environmental Specialist	Approval Date: 9/21/2017	Expiration Date:
E-mail Address: Mitch.Morris@williams.com	Conditions of Approval:	Attached ☒
Date: 9/12/2017 Phone: 505-632-4708		

* Attach Additional Sheets If Necessary

nJK1331055855

From: Fields, Vanessa, EMNRD [mailto:Vanessa.Fields@state.nm.us]
Sent: Monday, September 11, 2017 3:52 PM
To: Galer, Aaron <Aaron.Galer@Williams.com>
Cc: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Subject: [EXTERNAL] RE: Lowery Tank Battery Status

Aaron,

Aaron,

OCD has approved Williams proposed delineation plan for the lowery Tank Battery received via email 8/29/17 with the following conditions of approval. These conditions of approval will be attached to the hard copy when received.

Conditions of Approval:

- Following the NMOCD Guidelines for Remediation's of Leaks, Spills and Releases the remediation's levels for soils at the Lowery Tank Battery are as follows 10 mg/kg Benzene, 50 mg/kg BTEX and 100 mg/kg TPH

    - Williams will fully delineate the release both horizontally and vertically. Boreholes that exceeded 100ppm OVM or exhibit heavy staining and/or apparent hydrocarbon impacts will be considered impacted until sampled.

    - Delineation must be completed by November 11, 2017.

    - Horizontal delineation of soil impacts 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; C6 thru C36). Soil sampling must be both within the impacted area and beyond.

    - Vertical delineation of soil impacts 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; C6 thru C36), 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 the sites closure standards must be demonstrated as existing above the water table.

- Composite sampling will not be allowed for delineation

- 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).

- Within 30 days of completion of delineation Williams will submit to the OCD a delineation report and proposed alternative remediation plan.

Please let me know if you have any questions.

Thank you,

Vanessa Fields
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 119
Cell: (505) 419-0463
vanessa.fields@state.nm.us

From: Galer, Aaron [mailto:Aaron.Galer@Williams.com]
Sent: Tuesday, August 29, 2017 9:45 AM
To: Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Subject: RE: Lowery Tank Battery Status

Good morning Vanessa,

I am taking over the project management duties for the Lowery Tank Battery. Have you had a chance to review the attached report, specifically section 8 which describes our delineation plan?

From: Fields, Vanessa, EMNRD [mailto:Vanessa.Fields@state.nm.us]
Sent: Friday, August 11, 2017 8:50 AM
To: Webre, Matt <Matt.Webre@Williams.com>
Cc: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Perrin, Charlie, EMNRD

<charlie.perrin@state.nm.us>; Powell, Brandon, EMNRD <Brandon.Powell@state.nm.us>
Subject: Lowery Tank Battery Status

Good morning Matt,

Could you provide the OCD with a status update on the Lowery Tank Battery?

Thank you,

Vanessa Fields
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 119
Cell: (505) 419-0463
vanessa.fields@state.nm.us

Environmental Affairs
188 County Road 4900
Bloomfield, NM 87413
505/632-4600
505/632-4781 Fax

July 9, 2015

Mr. Jonathan D. Kelly
New Mexico Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos
Aztec, NM 87410

RE: Interim Corrective Action and Supplemental Environmental Site Investigation Report
Lowery Tank Battery
Rio Arriba County, New Mexico

Dear Mr. Kelly:

Attached is a copy of the Interim Corrective Action and Supplemental Environmental Site Investigation Report for the Williams Four Corners LLC Lowery Tank Battery for your review.

If you have an questions or concerns please contact me at kelsey.christiansen@williams.com or at (505) 632-4606.

Sincerely,

Kelsey Christiansen
Environmental Specialist

INTERIM CORRECTIVE ACTION and SUPPLEMENTAL ENVIRONMENTAL SITE INVESTIGATION REPORT

Property:

Lowery Tank Battery
NE ¼ SE ¼ Sec 16, T26N, R6W
Rio Arriba County, New Mexico

June 16, 2015
Apex Project No. 7030413G001

Prepared for:

Williams Four Corners LLC
188 Road 4900
Bloomfield, New Mexico 87413
Attn: Mr. Matt Webre, P.G.

Prepared by:

Kyle Summers, CPG
Branch Manager / Senior Geologist

Elizabeth Scaggs, P.G.
Division Manager

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Lowery Tank Battery
NE ¼ SE ¼ Sec 16, T26N, R6W
Rio Arriba County, New Mexico

Apex Project No. 7030413G001

1.0 INTRODUCTION

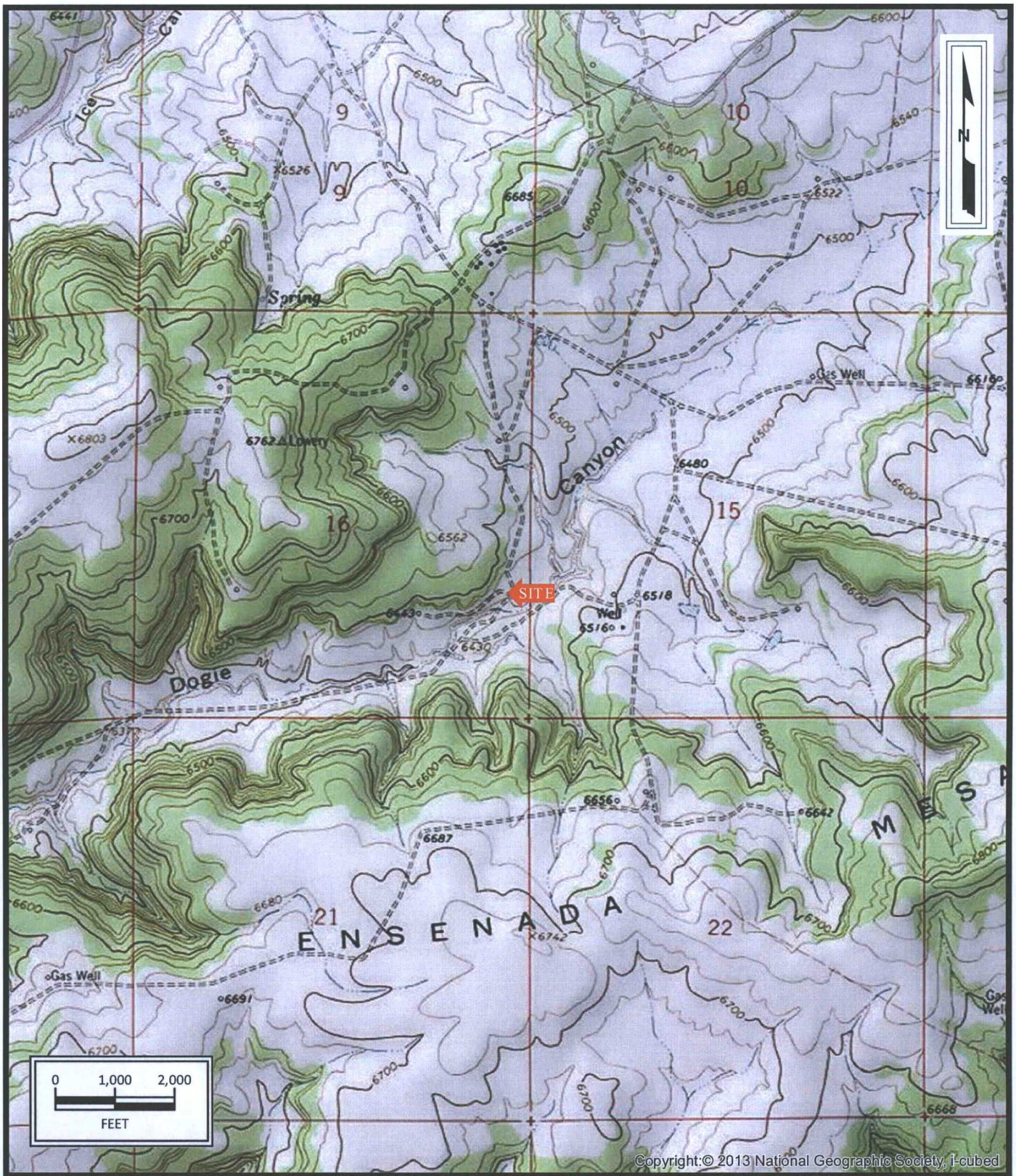
1.1 Site Description and Background

The Williams Four Corners LLC (Williams) Lowery Tank Battery is located in the NE ¼ of the SE ¼ of Section 16, Township 26 North, Range 6 West (36.48418 N, 107.46542 W), in Rio Arriba County, New Mexico, referred to hereinafter as the "Site". The property on which the Site is located is owned by the State of New Mexico and comprised primarily of native canyon rangeland periodically interrupted by oil and gas gathering and production facilities. The Site currently consists of one (1) 400-barrel (bbl) condensate/produced water tank, one (1) below grade tank (estimated at 250 bbl), two (2) small field-support tanks containing glycol and methanol, and related appurtenances, all situated within a lined secondary containment.

During 2013, while moving a below-grade tank (BGT) at the Williams Lowery Tank Battery, soil impacted by operations associated with natural gas gathering was observed underlying the tank. The observed impact is believed to be the result of a historic unlined pit.

A limited environmental site investigation was performed during March 2013 to further evaluate the extent of hydrocarbon impact to the substrate. Analytical results from the investigative soil samples identified elevated concentrations of constituents of concern (COCs) in soils at the Site. It appears that historically released liquids have drained down to the underlying bedrock and followed this surface away from the source area, affecting overlying subsurface soils in the process. These activities and associated results are described in the *Limited Site Investigation – Lowery Tank Battery*, revised September 3, 2013 - Southwest Geoscience (now Apex TITAN, Inc.).

A topographic map is included as Figure 1, a 2012 aerial photograph of the Site vicinity is included as Figure 2. Figure 3 is a Site Map, indicating the approximate location of the BGT, as well as the locations of all soil borings advanced during site investigation activities to date.



Lowery Tank Battery
SE1/4 S16 T26N R6W
Rural Rio Arriba County, New Mexico
36.484322N, 107.465311W

Project No. 7030413G001.001

Apex TITAN, Inc.
606 South Rio Grande, Suite A
Aztec, NM 87410
Phone: (505) 334-5200
www.apexcos.com
A Subsidiary of Apex Companies, LLC

FIGURE 1
Topographic Map
Gonzales Mesa, NM Quadrangle
1963

Lowery Tank Battery
SE1/4 S16 T26N R6W
Rural Rio Arriba County, New Mexico
36.484322N, 107.465311W

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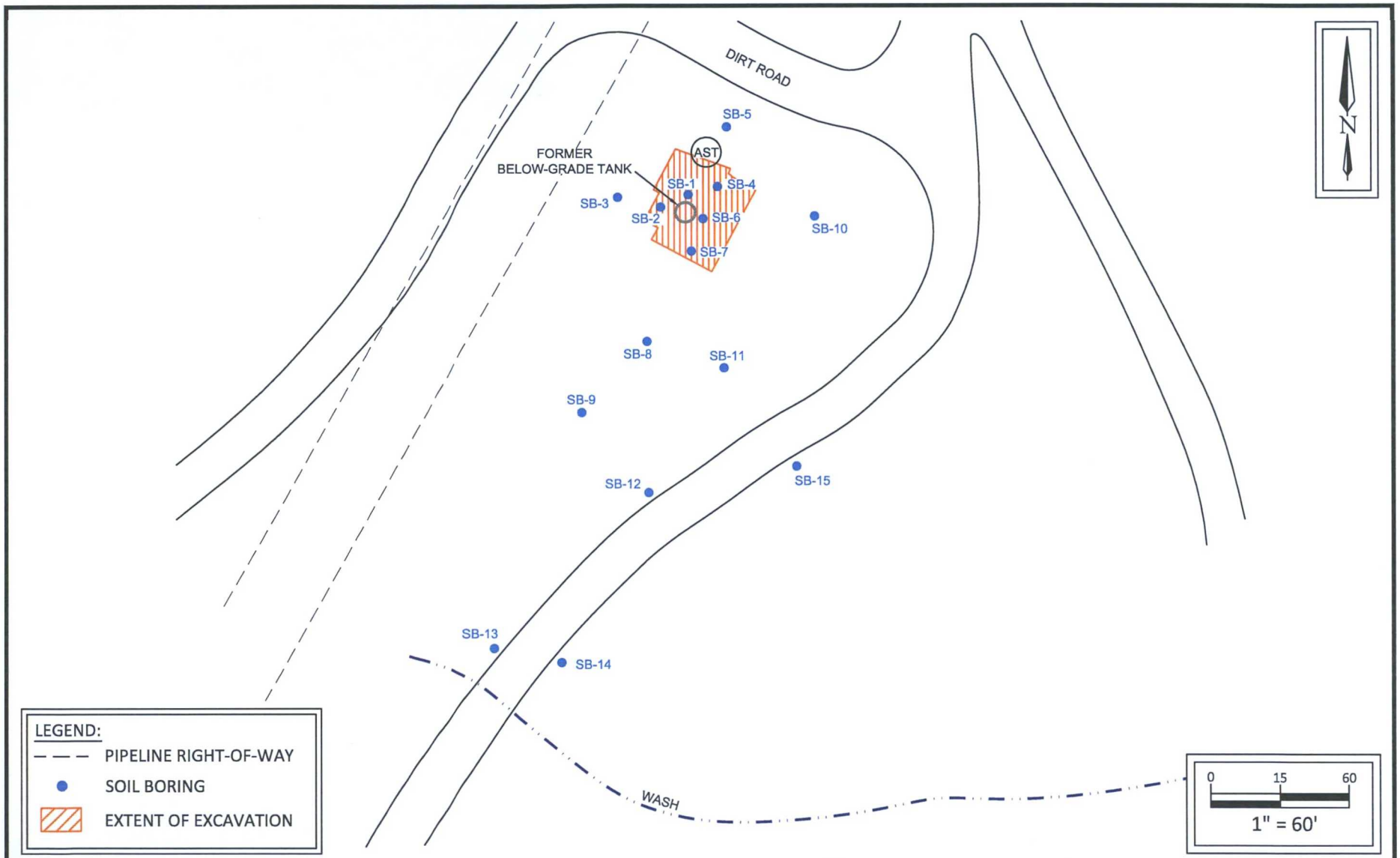
FIGURE 2
Site Vicinity Map



Lowery Tank Battery
SE1/4 S16 T26N R6W
Rural Rio Arriba County, New Mexico
36.484322N, 107.465311W

Project No. 7010413G001.001

Apex TITAN, Inc.
606 S. Rio Grande, Suite A
Aztec, New Mexico 87410
Phone: (505) 334-5200
www.apexcos.com
A Subsidiary of Apex Companies, LLC

FIGURE 3
Site Map

Z:\Houston South\Drafting\New Mexico 04\2013\7010413G001\Figure 3.dwg 04/15/15

1.2 Objectives

In accordance with the October 2, 2013 *Proposed Supplemental Environmental Site Investigation and Corrective Action Work Plan* – Southwest Geoscience, and with input from the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) New Mexico Oil Conservation Division (OCD) District 3, the objectives of the interim corrective action and supplemental environmental investigation activities included:

1.) Further evaluating the magnitude and extent of COCs in the on-site soil;

2.) Reducing the volume of affected material in the source area by physical removal of accessible impacted soil; and

3.) Treating soils in-situ with a chemical oxidizer, utilizing a gravity-induced application system and down-gradient injection points.

The in-situ chemical oxidation has not yet been initiated. The Geoprobe® rig was unable to advance the larger probes required to install the injection points which, in turn, are required for a portion of the chemical application. Treatment options will be re-evaluated after delineation activities have been completed.

1.3 Site Ranking

In accordance with the EMNRD OCD *Guidelines for Remediation of Leaks, Spills and Releases*, Apex Titan, Inc. (Apex) utilized the general site characteristics to determine the appropriate "ranking" for the Site. The ranking criteria and associated scoring are provided in the following table:

Ranking Criteria			Ranking Score
Depth to Groundwater	<50 feet	20	**10**
	50 to 99 feet	10	
	>100 feet	0	
Wellhead Protection Area • <1,000 feet from a water source, or; <200 feet from private domestic water source.	Yes	20	**0**
	No	0	
Distance to Surface Water Body	<200 feet	20	**20**
	200 to 1,000 feet	10	
	>1,000 feet	0	
Total Ranking Score			**30**

Based on Apex's evaluation of the scoring criteria and currently available data, the Site would earn a maximum Total Ranking Score of "30". This ranking is based on the following:

- A soil boring advanced adjacent to Dogie Canyon Wash reached a total depth of 44 feet below grade surface (bgs) without encountering groundwater. The depth to groundwater based on available information is estimated to be greater than 50

feet bgs at the Site. However, the depth to groundwater in this area may fluctuate seasonally, and will be further evaluated as more information is available.

- The nearest water well identified by a search of the New Mexico Water Rights Reporting System is located over 3,000 meters away from the Site.

- The Dogie Canyon Wash is less than 200 feet from the Site.

Based on a Total Ranking Score of 30, cleanup goals for soil located at the Site include: 10 milligrams per kilogram (mg/Kg) for benzene, 50 mg/Kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX), and 100 mg/Kg for total petroleum hydrocarbon (TPH).

1.4 Standard of Care & Limitations

The services of Apex were performed in accordance with standards customarily provided by a firm rendering the same or similar services in the area during the same time period. Apex makes no warranties, expressed or implied, as to the services performed hereunder. Additionally, Apex does not warrant the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties). This scope of services was performed in accordance with the scope of work agreed with the client.

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-Site activities and other services performed under this scope of work and it should be noted that this information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, or not present during these services, and Apex cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this scope of services. Environmental conditions at other areas or portions of the Site may vary from those encountered at actual sample locations. Apex's findings and recommendations are based solely upon data available to Apex at the time of these services.

This report has been prepared for the exclusive use of Williams Four Corners LLC, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the expressed written authorization of Williams Four Corners LLC and Apex. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in the proposal, the report, and Apex's Agreement. The limitation of liability defined in the agreement is the aggregate limit of Apex's liability to the client.

2.0 CORRECTIVE ACTION

Following discussions with local EMNRD OCD District 3 personnel, Williams initiated the removal of accessible source area affected soils. During November 2013, 954 cubic yards of soil was removed from the presumed historical pit area by excavation and subsequently transported to the Envirotech, Inc. Landfarm near Hilltop, New Mexico for disposal/treatment. Graham Stanke (Williams) and Johnathan Kelly (OCD - District 3) were present during the excavation activities, and Kyle Summers, an Apex environmental professional, provided environmental support.

The lithology encountered during the execution of corrective action activities consisted primarily of silty sands and silty clays. The overall average surface expression of the excavation measured approximately 37 feet long by 35 feet wide, with a total depth ranging from 16 to 19 feet bgs. The floor of the excavation was relatively flat, however the surrounding grade varied considerably.

The executed Form C-138 is provided in Appendix A. The excavation was backfilled with clean/unaffected fill and contoured to surrounding grade to facilitate the re-installation of the BGT system.

Figure 4 depicts the extents of the excavation and the corresponding confirmation sample locations and pertinent former soil boring locations. Photographic documentation of the field activities is included in Appendix B.

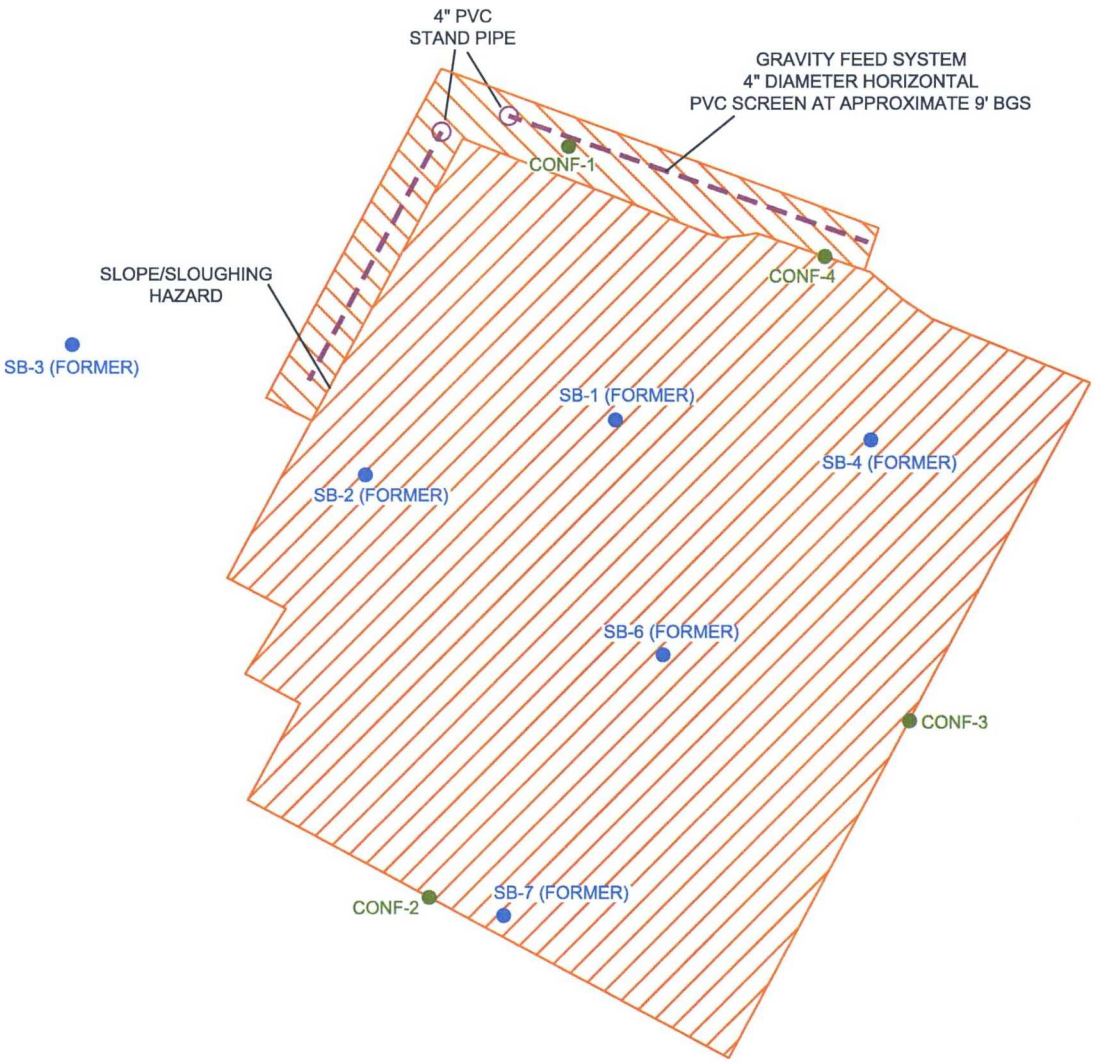
2.1 Excavation Sampling Program

To assist in determining the lateral limits of excavation and to identify target sampling zones, Apex screened head-space samples of Site soils with a photoionization detector (PID) fitted with a 10.6 eV lamp.

Apex's confirmation sampling program included the collection of four (4) final confirmation samples (Conf-1 through Conf-4) for laboratory analysis. Samples Conf-1 and Conf-2 were collected from potholes north and south of the early excavation at depths of approximately 12 feet to 13 feet bgs to assess potential lateral migration. The excavation was eventually extended to these locations, and they were ultimately utilized as extent samples for the excavation with approval from the OCD field representative. Samples Conf-3 and Conf-4 were collected from areas of the north and east sidewalls exhibiting possible staining. Samples were collected based on relative PID readings or other evidence of potential impact (and/or based on OCD field representative input), with consideration of pertinent soil boring data.

Due to the slope and the potential sloughing hazards, a final confirmation sample was not collected from the west wall (topographically upgradient). However, data from former soil boring SB-3 (located approximately 13 feet beyond the western excavation limits) and the associated analytical samples demonstrated no evidence of adverse impact from the ground surface to its total depth of 28 feet bgs.

Prior data from numerous former soil borings within the excavation footprint confirm that the soils at and below the floor of the excavation in the vicinity of the historic release exceed regulatory standards, and as such were not re-sampled.



LEGEND:

- HORIZONTAL SCREENING (9' BELOW GRADE)
- SOIL BORING (FORMER)
- CONFIRMATION SAMPLE
- EXTENT OF EXCAVATION (16'-19' DEEP)
- EXTENT OF EXCAVATION (10' DEEP)

0 5 10

1" = 10'

Lowery Tank Battery
SE1/4 S16 T26N R6W
Rural Rio Arriba County, New Mexico
36.484322N, 107.465311W

Project No. 7010413G001.001

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FIGURE 4
Excavation Extents and Sample Locations

Z:\Houston South\Drafting\New Mexico 04\2013\7010413G001\Figure 3.dwg 04/15/15

The confirmation soil samples were collected and placed in laboratory prepared glassware, labeled/sealed using the laboratory supplied labels, and placed on ice in a cooler, which was secured with a custody seal. The sample cooler and completed chain-of-custody form were relinquished to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico, for analysis.

2.2 Gravity-Induced Application System

To facilitate the projected in-situ application of a chemical oxidizer, a gravity-induced application system was installed immediately up-gradient (topographically) of the presumed historical source area.

Subsequent to backfilling the remediation excavation, two (2) trenches were installed at approximately 90 degrees to each other at the northern corner of the former excavation. Within the trenches, 4-inch diameter schedule-40 polyvinyl chloride (PVC) .020" machine-slotted well screen was placed horizontally (20 feet long on the northeast trench and 15 feet long on the northwest trench), at an approximate depth of 9 feet bgs, each with a blank PVC riser to the surface (see Figure 4). To allow the flow of chemical oxidizer while deterring an influx of sediment, the horizontal well screens were enveloped in a bed of pea gravel that is wrapped by a geotextile fabric. The trenches were then backfilled and contoured to surrounding grade.

The gravity-induced application system has not yet been utilized. It is part of an in-situ treatment system that includes down-gradient injection points that have not been installed. The full area of the hydrocarbon soil impact at the Site has not been fully delineated and treatment options will be re-evaluated after delineation activities have been completed.

3.0 SITE INVESTIGATION

3.1 Soil Borings

Apex's supplemental investigation activities were conducted on March 10, 2014 by Mr. Kyle Summers, an Apex environmental professional. Johnathan Kelly, (OCD - District 3) was present to witness three (3) of the four (4) soil boring advancements. As part of the approved scope of work, four (4) soil borings (SB-12 through SB-15) were advanced topographically down-gradient of the apparent source area to further define the lateral extent of the affected soil plume. Soil borings were advanced utilizing a direct push Geoprobe® rig.

Soil boring samples were collected continuously utilizing four-foot long core barrel samplers to the termination depth of each soil boring. Soil samples were observed to document soil lithology, color, moisture content, and visual and olfactory evidence of petroleum hydrocarbons. Field headspace analysis was conducted by placing a portion of each soil sample into a plastic ziplock bag. The plastic bag was sealed to permit the collection of any volatized gases. The air above the sample, the headspace, was then evaluated using a PID capable of detecting volatile organic compounds (VOCs). The PID was calibrated utilizing an isobutylene standard prior to use in the field.

The lithology encountered during the advancement of the soil borings generally included alternating silty sands and silty clays from the surface to the terminus of the boring. The borings were terminated at probe refusal in silty clay (SB-12, SB-14, SB-15) or sandstone (SB-13). Lithologic descriptions are presented on the soil boring logs included in Appendix C.

Petroleum hydrocarbon odors were detected in the field in soil samples collected from soil borings SB-12, SB-14, and SB-15. The PID readings from soil borings SB-12 through SB-15 ranged from below instrument detection to 1,242 parts per million (ppm) at depths ranging from the surface up to 44 feet bgs. Only soils collected from depths greater than 25 feet bgs exhibited evidence of hydrocarbon impact. Significant petroleum hydrocarbon odors and/or PID readings were not detected in the soil samples collected from soil boring SB-13. Field screening results are presented on soil boring logs included in Appendix C.

Groundwater was not encountered during the advancement of soil borings SB-12 through SB-15.

3.2 Investigation Sampling Program

Apex's soil sampling program involved submitting up to two (2) soil samples from each soil boring for laboratory analysis. Soil samples were collected from the zone exhibiting the highest PID reading, from a change in lithology, or from the bottom of the boring, based on the field professional's judgment. Soil sample intervals and analytical results are presented on Table 1, which also includes data from the initial Site investigation.

APEX

TABLE 1
Lowery Tank Battery
SOIL ANALYTICAL SUMMARY

Sample I.D.	Date	Sample Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO by 8015 (mg/kg)	TPH DRO by 8015 (mg/kg)	TPH by 418.1 (mg/kg)	Chloride (mg/kg)
New Mexico Entergy, Mineral & Natural Resources Department, Oil Conservation Division, Remediation Action Level			10	NE	NE	NE	50	100		100	250
Soil Boring Data from 2013 SSI											
SB-1	3.26.13	8.0	3.4	180	23	260	**466**	**4,700**	**520**	**1,600**	35
	3.26.13	30.0	**65**	330	24	240	**659**	**8,700**	**600**	**9,000**	140
	3.26.13	38.0	3.3	39	6	56	**104**	**1,600**	**250**	**1,200**	71
SB-2	3.26.13	10.0	<0.97	9.1	6.9	59	**75**	**1,700**	**1,000**	**3,000**	46
	3.26.13	26.0	<4.9	100	15	150	**265**	**3,800**	**540**	**4,200**	8.2
SB-3	3.26.13	6.0	<0.047	<0.047	<0.047	<0.094	<0.235	<4.7	<9.9	<20	53
	3.26.13	16.0	<0.048	<0.048	<0.048	<0.096	<0.24	<4.8	<9.7	<20	27
	3.26.13	28.0	<0.048	<0.048	<0.048	<0.096	<0.24	<4.8	<9.9	<20	13
SB-4	3.26.13	18.0	<0.47	1.7	1.5	16	19.2	**430**	**400**	**1,000**	140
	3.26.13	39.5	**83**	420	37	370	**910**	**13,000**	**890**	**12,000**	130
SB-5	3.26.13	32.0	<0.049	<0.049	<0.049	<0.097	<0.244	<4.9	<9.9	23	<7.5
	3.26.13	36.0	<0.048	<0.048	<0.048	<0.096	<0.24	<4.8	9.8	29	<7.5
SB-6	3.26.13	18.0	<2.4	38	12	130	**180**	**2,500**	**660**	**2,800**	43
	3.26.13	36.0	**19**	160	14	160	**353**	**4,300**	**530**	**4,300**	<15
SB-7	3.27.13	34.0	<0.048	<0.048	<0.048	<0.097	<0.241	<4.8	<9.7	<20	59
	3.27.13	40.0	<0.047	<0.047	<0.047	<0.094	<0.235	<4.7	14	35	22
SB-8	3.27.13	42.0	<0.047	1.0	0.33	3.1	4.4	**89**	**58**	**200**	<7.5
	3.27.13	44.0	1.0	32	3.8	45	**82**	**800**	**140**	**810**	<7.5

TABLE 1
Lowery Tank Battery
SOIL ANALYTICAL SUMMARY

Sample I.D.	Date	Sample Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO by 8015 (mg/kg)	TPH DRO by 8015 (mg/kg)	TPH by 418.1 (mg/kg)	Chloride (mg/kg)
New Mexico Entergy, Mineral & Natural Resources Department, Oil Conservation Division, Remediation Action Level			10	NE	NE	NE	50	100		100	250
Soil Boring Data from 2013 SSI											
SB-9	3.27.13	38.0	<0.046	<0.046	<0.046	<0.093	<0.231	<4.6	<10	<20	16
SB-10	3.27.13	36.0	<0.48	4.0	<0.97	8.8	12.8	**220**	**64**	**130**	<1.5
SB-11	3.27.13	32.0	<0.24	1.1	<0.47	2.9	4.0	82	15	34	<7.5
	3.27.13	36.0	**15**	93	7.8	80	**196**	**2,600**	**260**	**1,400**	7.9
Soil Boring Data from 2014 SSI											
SB-12	3.10.14	32.0	**13**	85	7.3	76	**181**	**2,600**	**130**	**2,400**	<7.5
SB-13	3.10.14	20.0	<0.049	<0.049	<0.049	<0.098	<0.245	<4.9	<9.9	<20	<7.5
SB-14	3.10.14	34.0	**11**	57	5.1	51	**124**	**1,900**	**210**	**2,000**	<7.5
	3.10.14	44.0	<0.047	<0.047	<0.047	<0.095	<0.236	<4.7	<10	<20	11.0
SB-15	3.10.14	34.0	**55**	290	24	250	**619**	**9,000**	**1,100**	**11,000**	<7.5
	3.10.14	40.0	<0.047	<0.047	<0.047	<0.095	<0.0236	6.7	<10	**110**	<7.5
Excavation Confirmation Samples											
Conf-1	11.14.13	12-13	<0.049	<0.049	<0.049	<0.098	<0.245	<4.9	<9.9	NA	NA
Conf-2	11.15.13	12-13	<0.048	<0.048	<0.048	<0.097	<0.241	<4.8	<10	NA	NA
Conf-3	11.18.13	12-13	<0.048	<0.048	<0.048	<0.096	<0.240	<4.8	<10	NA	NA
Conf-4	11.18.13	12-13	<0.047	<0.047	<0.047	<0.094	<0.235	<4.7	<9.9	NA	NA

Note: Concentrations in **bold** and/or yellow exceed the applicable OCD *Remediation Action Level*

Note: Samples in light blue were subsequently removed by excavation

NE = Not Established

NA=Not Analyzed

4.0 LABORATORY ANALYTICAL PROGRAM

4.1 Laboratory Analytical Methods

The soil samples collected from the corrective action excavation and investigative soil borings were analyzed for TPH Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) utilizing Environmental Protection Agency (EPA) SW-846 Method 8015, and benzene, toluene, ethylbenzene and xylenes (collectively BTEX) utilizing EPA SW-846 Method 8021. Soil samples collected from the soil borings were also analyzed for TPH utilizing EPA Method 418.1, and chlorides utilizing EPA Method 300. Laboratory analytical results are summarized in Table 1. The executed chain-of-custody form and laboratory data sheets are provided in Appendix D.

4.2 Quality Assurance/Quality Control (QA/QC)

All non-disposable sampling equipment was cleaned using an Alconox® wash and potable water rinse prior to the beginning of the project and before the collection of each sample.

Soil samples were collected and placed in laboratory prepared glassware, sealed with custody tape and placed on ice in a cooler, which was secured with a custody seal. The sample coolers and completed chain-of-custody forms were relinquished to HEAL for standard turnaround.

HEAL performed the analyses of samples under an adequate and documented quality assurance program to meet the project and data quality objectives. The laboratory's quality assurance program is generally consistent the quality standards outlined in the National Environmental Laboratory Accreditation Program, as amended. In addition, the data generated by HEAL meet the intralaboratory performance standards for the selected analytical method and the performance standards are sufficient to meet the bias, precision, sensitivity, representativeness, comparability, and completeness, as specified in the project data quality objectives. Sample results that resulted in Data Qualifier (DQ) flags are listed in the following table:

Table 2
Data Qualifier Flags

Sample ID	Data Qualifier Flag	Comments/Reactions
SB-15 (34')	SW-846 Method 8015 TPH Diesel Range Spike Recovery was outside the accepted recovery limits.	The surrogate recovery of "0" renders the accuracy of the analytical result questionable. However, the similarity of the combined GRO and DRO fraction concentrations when compared with the 418.1 TPH result (which exhibited no data qualifier flags) indicates the value should be suitable as an estimated value.
SB-15 (34')	SW-846 Method 8015 TPH Gasoline Range Spike Recovery was outside the accepted recovery limits.	The TPH GRO data is suitable for use as an estimated value. The surrogate recovery was slightly outside the accepted "high" limit of 129% with a recovery of 135%. The 418.1 TPH concentration (with no qualifier flags) correlates acceptably with the combined DRO/GRO fractions from the SW-846 Method 8015.

5.0 SITE CHARACTERIZATION

5.1 Geology & Hydrogeology

According to the New Mexico Bureau of Geology and Mineral Resources (Geologic Map of New Mexico 2003), the Site overlies the Eocene age San Jose geologic formation. The San Jose geologic formation contains a mixture of clastic sedimentary rocks varying from siltstone to conglomerate, dominated by rocks containing sand-sized particles. The lithology encountered at the Site during the advancement of soil borings consisted of silty sand deposits derived from erosion of the parent San Jose formation which comprises the surrounding hilltops and mesas. Based on the available soil boring samples, these alluvia generally consist of brown to olive silty sands and silty clays from the ground surface to at least 44 feet bgs.

The major aquifer underlying the Site vicinity is listed as the Colorado Plateaus Aquifer, which is made up of four smaller aquifers, the Uinta-Animas, the Mesa Verde, the Dakota-Glen, and the Coconino-De Chelly. The Uinta-Animas is the shallowest of these aquifers, and is present in the San Juan Basin. The general composition of the aquifers is moderately to well-consolidated sedimentary rocks of an age ranging from Permian to Tertiary. Each aquifer is separated from the others by an impermeable confining unit. Two of the confining units are completely impermeable and cover the entire area of the aquifers. The other two confining units are less extensive and are thinner. These units allow water to flow between the principal aquifers.

The initial groundwater-bearing units (GWBU) encountered in the Largo Canyon area are typically composed of unconsolidated to moderately consolidated silty sands located in or near the drainage channels. The initial GWBU at the Site was not encountered during investigation activities.

6.0 DATA EVALUATION

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. To address activities related to condensate releases, the New Mexico EMNRD OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the OCD rules, specifically New Mexico Administrative Code (NMAC) 19.15.29 and NMAC 19.15.30. These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

6.1 Excavation Confirmation Samples

Apex compared the BTEX and TPH concentrations associated with the final confirmation samples (Conf-1 through Conf-4) collected from the excavated area to the OCD *Remediation Action Levels* for sites having a total ranking score of "30".

Total Petroleum Hydrocarbons

The laboratory analyses of the confirmation samples (Conf-1 through Conf-4) collected from soils remaining in place at the excavation sidewalls do not indicate combined TPH GRO/DRO concentrations above the laboratory reporting limits (RLs), which are below the OCD *Remediation Action Level* for a Site ranking of "30".

Benzene

The laboratory analyses of confirmation samples (Conf-1 through Conf-4) collected from soils remaining in place at the excavation sidewalls do not indicate benzene concentrations above the laboratory RLs, which are below the OCD *Remediation Action Level.*

Total BTEX

The laboratory analyses of the confirmation samples (Conf-1 through Conf-4) collected from soils remaining in place at the excavation sidewalls do not indicate total BTEX concentrations above the laboratory RLs, which are below the OCD *Remediation Action Level.*

Confirmation sample results and pertinent supporting soil boring analytical results from the 2013 *Limited Site Investigation* are provided in Table 1.

Due to the slope and potential sloughing hazards, a final confirmation sample was not collected from the west wall. However, data from former soil boring SB-3 (located approximately 13 feet beyond the western excavation limits) demonstrated no indications of adverse impact from the ground surface to its total depth of 28 feet bgs.

Prior data from numerous former soil borings (SB-1, SB-2, SB-4, and SB-6) within the excavation footprint confirm that the soils at and below the floor of the excavation in the vicinity of the historic release exceed regulatory standards.

6.2 Soil Boring Samples

Apex compared the BTEX and TPH concentrations associated with the soil boring samples to the OCD *Remediation Action Levels* for sites having a total ranking score of "30".

Total Petroleum Hydrocarbons

Soil samples collected from soil borings SB-12, SB-14, and SB-15 exhibited combined TPH GRO/DRO and/or TPH 418.1 concentrations ranging from below the laboratory RLs to 11,000 mg/kg. Each of these soil borings exhibited TPH concentrations in at least one sampling interval that exceeded the OCD's *Remediation Action Level* of 100 mg/Kg for a Site ranking of "30".

The soil sample collected from soil boring SB-13 did not exhibit TPH GRO/DRO or TPH 418.1 concentrations above the laboratory RLs which are below the OCD's *Remediation Action Level* of 100 mg/Kg for a Site ranking of "30". Soil boring SB-13 was terminated at a depth of 20 feet bgs, due to probe refusal (sandstone).

Benzene

Soil samples collected from soil borings SB-12, SB-14, and SB-15 exhibited benzene concentrations ranging from below the laboratory RLs to 55 mg/kg. Each of these soil borings exhibited benzene concentrations in at least one sampling interval that exceeded the OCD's *Remediation Action Level* of 10 mg/Kg.

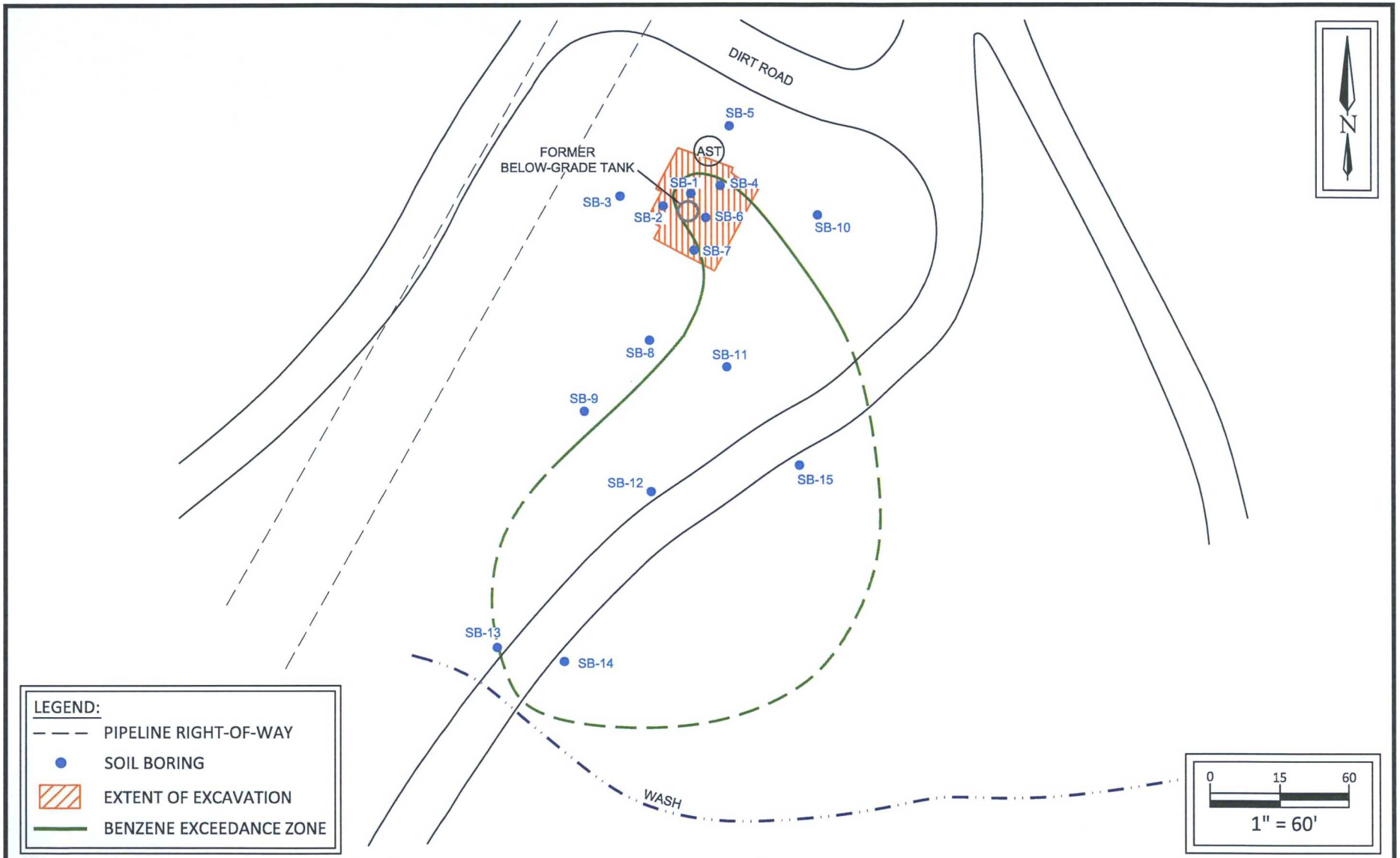
The soil sample collected from soil boring SB-13 did not exhibit benzene concentrations above the laboratory RLs which are below the OCD's *Remediation Action Level* of 10 mg/Kg. Soil boring SB-13 was terminated at a depth of 20 feet bgs, due to probe refusal (sandstone).

Total BTEX

Soil samples collected from soil borings SB-12, SB-14, and SB-15 exhibited total BTEX concentrations ranging from below the laboratory RLs to 619 mg/kg. Each of these soil borings exhibited total BTEX concentrations in at least one sampling interval that exceeded the OCD's *Remediation Action Level* of 50 mg/Kg.

The soil sample collected from soil boring SB-13 did not exhibit total BTEX concentrations above the laboratory RLs which are below the OCD's *Remediation Action Level* of 50 mg/Kg. Soil boring SB-13 was terminated at a depth of 20 feet bgs, due to probe refusal (sandstone).

The results of soil sample analyses are summarized in Table 1. Figures 5A (benzene), 5B (total BTEX), and 5C (TPH) provide a visual depiction of the estimated OCD *Remediation Action Level* Exceedance Zones in soil, based on available information.



Lowery Tank Battery
SE1/4 S16 T26N R6W
Rural Rio Arriba County, New Mexico
36.484322N, 107.465311W

Project No. 7010413G001.001

Apex TITAN, Inc.
606 S. Rio Grande, Suite A
Aztec, New Mexico 87410
Phone: (505) 334-5200
www.apexcos.com
A Subsidiary of Apex Companies, LLC

FIGURE 5A
Benzene Remediation Action Level Exceedance Map

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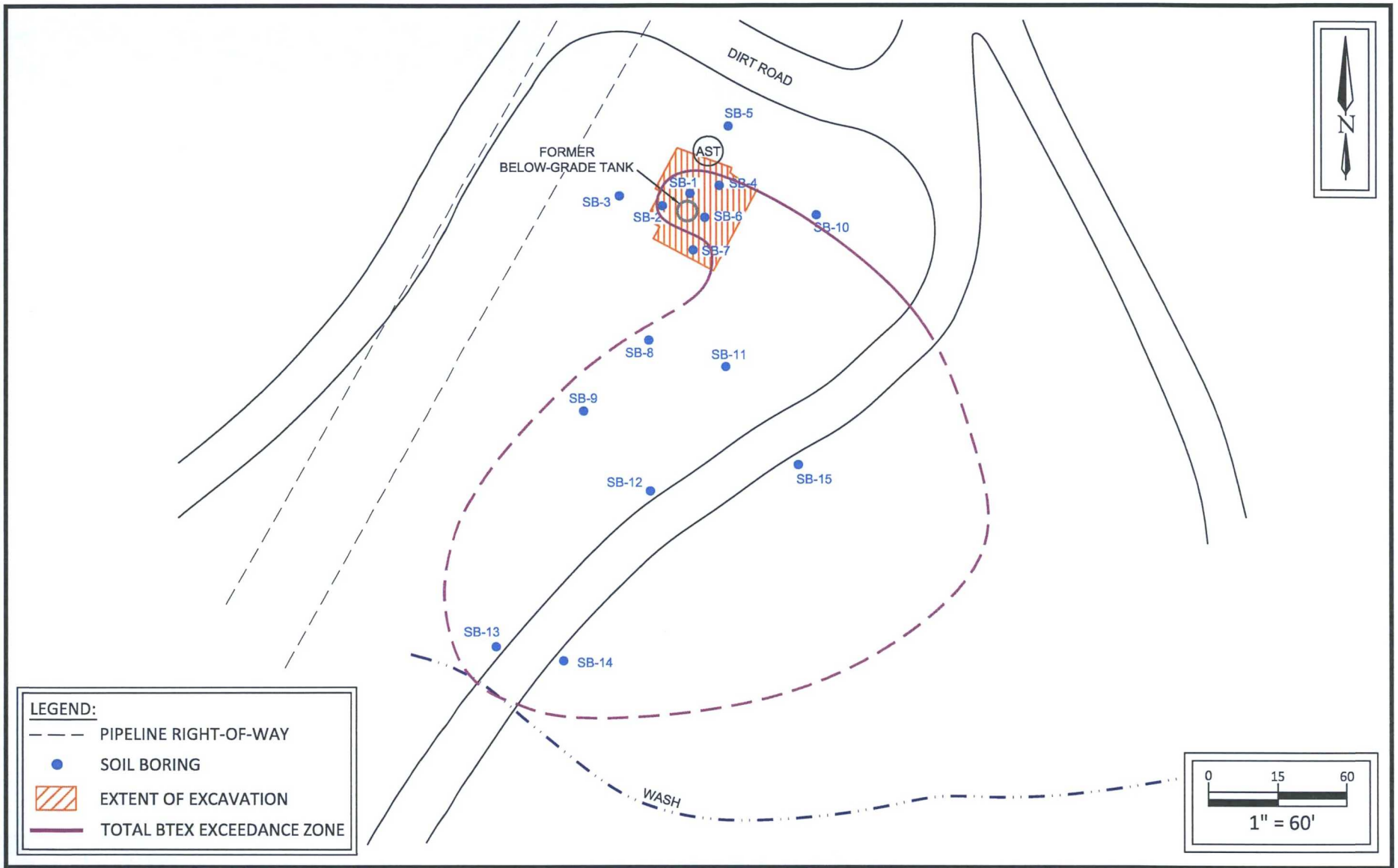

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FIGURE 5B
Total BTEX Remediation Action Level Exceedance Map

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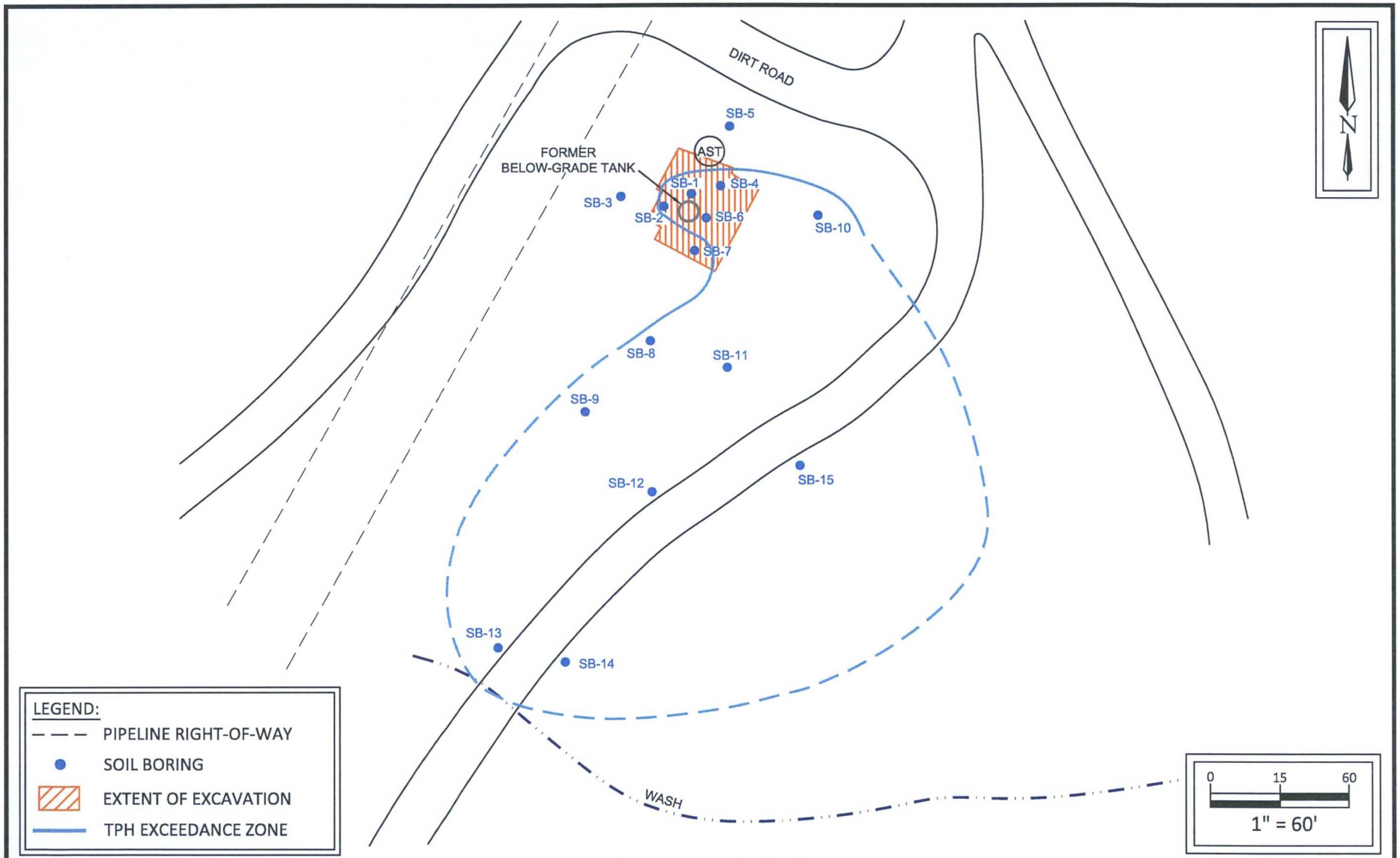

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FIGURE 5C
TPH Remediation Action Level Exceedance Map

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7.0 FINDINGS

The Williams Lowery Tank Battery is located in the NE ¼ of the SE ¼ of Section 16, Township 26 North, Range 6 West, in Rio Arriba County, New Mexico. The property on which the Site is located is owned by the State of New Mexico and comprised primarily of native canyon rangeland periodically interrupted by oil and gas gathering and production facilities. The Site currently consists of one (1) 400 bbl condensate/produced water tank, one (1) below grade tank (estimated at 250 bbl), two (2) small field-support tanks containing glycol and methanol, and related appurtenances, all situated within a lined secondary containment.

During November 2013, 954 cubic yards of soil was removed from the presumed historical pit area by excavation and subsequently transported to the Envirotech, Inc. Landfarm near Hilltop, New Mexico for disposal/treatment.

On March 10, 2014 Apex advanced four (4) soil borings topographically down-gradient of the apparent source area to further define the lateral extent of the affected soil plume. Soil borings were advanced utilizing a direct push Geoprobe® rig.

The soil samples collected from the corrective action excavation and investigative soil borings were analyzed for TPH GRO/DRO utilizing EPA SW-846 Method 8015, and BTEX) utilizing EPA SW-846 Method 8021. Soil samples collected from the soil borings were also analyzed for TPH utilizing EPA Method 418.1, and chlorides utilizing EPA Method 300.

The initial groundwater-bearing unit at the Site was not encountered during investigation activities.

The laboratory analyses of the confirmation samples collected from soils remaining in place at the excavation sidewalls do not indicate combined TPH GRO/DRO or BTEX concentrations above the OCD *Remediation Action Levels.*

Prior data from numerous former soil borings (SB-1, SB-2, SB-4, and SB-6) within the excavation footprint confirm that the soils at and below the floor of the excavation in the vicinity of the historic release exceed regulatory standards.

Soil samples collected from soil borings SB-12, SB-14, and SB-15 exhibited COC concentrations in at least one sampling interval that exceeded the OCD's *Remediation Action Level.* Affected soils appear to be present predominantly at depth greater than 25 feet bgs.

8.0 PROPOSED DELINEATION

Based on the results of Site investigation activities to date, Williams proposes to perform additional delineation activities at the Site to further evaluate the vertical and horizontal extent of hydrocarbon impact.

8.1 Proposed Soil Boring Program

Up to eight (8) soil borings will be advanced on-Site utilizing a hollow-stem auger drilling rig. The soil borings will be advanced at select locations topographically down-gradient from the previously installed soil borings SB-1 through SB-15. The soil borings will be advanced to a minimum estimated depth of 45 feet bgs, five (5) to ten (10) feet below the initial water table (if encountered), or auger refusal. If an identifiable confining layer is encountered during soil boring advancement, the boring will not extend through the unit, or will be plugged back to the unit. Sandstone is anticipated at most locations at approximately 40 to 45 feet bgs. Potential soil boring locations are presented on Figure 6. Actual locations and the number of soil borings advanced may vary, depending on field conditions and observations, and New Mexico State Land Office (NMSLO) approvals.

Reusable sampling and drilling equipment will be decontaminated using an Alconox® wash and potable water rinse prior to commencement of the project and between the advancement of each soil boring.

Soil samples will be collected continuously using core barrels to document lithology, color, relative moisture content and visual or olfactory evidence of impairment. In addition, the samples will be scanned with a PID to evaluate the presence of VOCs.

Any investigation-derived waste will be stored in 55-gallon steel drums pending characterization. Affected materials will be transported to an OCD-approved facility for disposal/treatment.

8.2 Proposed Soil Sampling Program

Apex's investigative soil sampling program will consist of the following:

1) Collection of up to three (3) soil samples from each of the soil borings from any of the following locations:

   a) the zone exhibiting the highest concentration of VOC's based on visual, olfactory or PID evidence,

   b) from the capillary fringe zone,

   c) from a change in lithology, or

   d) from the bottom of the boring.

The soil samples will be collected in laboratory prepared glassware and placed on ice in a cooler, which will be secured with a custody seal. The samples will be transported HEAL with a completed chain-of-custody form.

8.3 Optional Monitoring Well Installation

In the event that groundwater is encountered prior to the vertical delineation of hydrocarbon soil impact, one or more monitoring wells may be installed. The installation of monitoring wells would, in part, be dependent on the ability to obtain approvals from the New Mexico Office of the State Engineer and NMSLO. If installed, the appropriate monitoring well permit fees and paperwork would be submitted as soon as practicable following the installation(s).

Monitoring wells would be completed as follows:

- Installation of 10 to 20 feet of 2-inch diameter, machine slotted (0.010 inch) schedule 40 PVC well screen assembly with a threaded bottom plug;
- Installation of schedule 40 riser pipe to surface;
- Addition of graded silica sand for annular sand pack around the well screen from the bottom of the well to two feet above the top of the screen;
- Placement of two feet of hydrated bentonite pellets above the sand;
- Addition of cement/bentonite slurry to the surface; and
- Installation of an above-grade steel riser with an integrated padlock hasp.

The sampling and monitoring wells will be developed by surging and removing groundwater until the fluid appears free of fine-grained sediment.

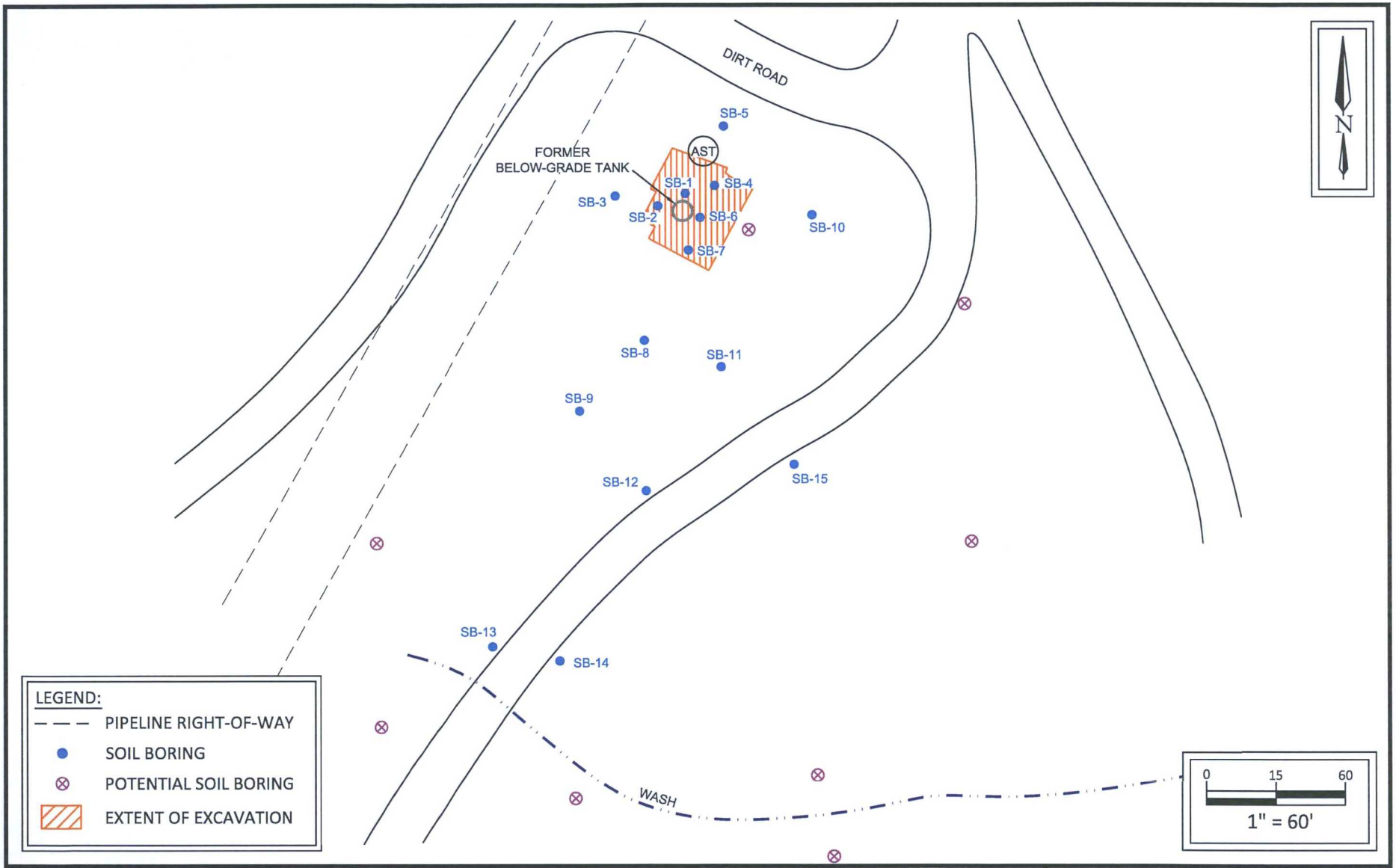
8.4 Proposed Groundwater Sampling Program

If one (1) or more monitoring wells is installed, one (1) groundwater sample will be collected from each monitoring well utilizing low-flow or bailer sampling techniques to evaluate potential COCs in on-site groundwater. Based on these results, a separate groundwater investigation may be warranted.

Low-flow refers to the velocity with which groundwater enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established site sampling objectives. Flow rates on the order of 0.1 to 0.5 liters per minute (L/min) will be maintained during the sampling activities using dedicated sampling equipment.

The utilization of low-flow minimal drawdown techniques enables the isolation of the screened interval groundwater from the overlying stagnant casing water. The pump intake is placed within the screened interval such that the groundwater pumped is drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone.

The monitoring wells will be purged until produced groundwater is consistent in color, clarity, pH, and conductivity. The general goal for stabilization of the monitored groundwater parameters of pH, temperature, and conductivity is three (3) consecutive readings at five (5) minute intervals that demonstrate less than 10% variation.



Lowery Tank Battery
SE1/4 S16 T26N R6W
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FIGURE 6
Potential Soil Boring Location Map

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The groundwater samples will be collected in laboratory prepared glassware and placed on ice in a cooler, which will be secured with a custody seal. The samples will be transported to HEAL with a completed chain-of-custody form.

8.5 Proposed Laboratory Analytical Program

The soil and/or groundwater samples collected during the investigation will be analyzed for BTEX utilizing EPA SW-846 Method 8021.

8.6 Supplemental Environmental Site Investigation Report

Upon completion of supplemental site investigation activities and receipt of the analytical results, a Supplemental Environmental Site Investigation Report will be prepared that will include documentation of the field activities, tabular data summaries, a site plan detailing pertinent site features, laboratory analytical reports, an evaluation of sampling results and recommendations concerning further action.

APEX

APPENDIX A

Executed C-138

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 00068-0289

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

Form C-138
Revised August 1, 2011

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. **Generator Name and Address:**
Williams Four Corners LLC., 188 Country Road 4900, Bloomfield, NM 87413

2. **Originating Site:**
Lowery Tank Battery

3. **Location of Material (Street Address, City, State or ULSTR):**
190 County Road 4980, Bloomfield, San Juan County, New Mexico
Unit I, Section 16, Township 26N, Range 6W

4. **Source and Description of Waste:**
Source/Description: Produced water/condensate release from below-grade tank located at field gathering tank battery/Soil impacted from release.

Estimated Volume 350 yd³ / bbls Known Volume (to be entered by the operator at the end of the haul) 954 yd³ bbls

5. **GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS**

I, Graham Stahnke, representative or authorized agent for Williams Four Corners LLC do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☒ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency* ☐ *Monthly* ☐ *Weekly* ☐ *Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, Graham Stahnke, representative for Williams Four Corners LLC authorize Envirotech, Inc. to complete the required testing/sign the Generator Waste Testing Certification.

I, Kendra Running, representative for Envirotech, Inc. do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. **Transporter:**
Triple F Construction, Envirotech

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #: Envirotech Remediation Facility Permit # NM-01-0011

Address of Facility: Hilltop, New Mexico

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☒ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☒ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: Kendra Running TITLE: Waste Coordinator DATE: 11/13/13

SIGNATURE: Kendra Running TELEPHONE NO.: Envirotech, Inc

Surface Waste Management Facility Authorized Agent

APPENDIX B

Photographic Documentation

Photograph 1

View of early stages of excavation facing south.

Photograph 2

View of early stages of excavation.

Photograph 3

View of excavation facing south.

Photograph 4

View of excavation facing north.

Photograph 5

View excavation floor facing north.

Photograph 6

View of gravity-induced application system facing south during pea gravel application.

APPENDIX C

Southwest Geoscience and Apex Soil Boring Logs

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

▼ Depth at Completion

▼ Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-1
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Casing Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	FILL		0			0%		0	
	SILTY CLAY, Dark Brown Grades to Dark Olive Brown, Slightly Moist, Hydrocarbon Odor		5	6-8		0%		545	
	SAND, Olive Gray, Slightly Moist, Hydrocarbon Odor		10			100%		399	
			15			100%		436	
						100%		277	
			20			100%		373	
	SILTY SAND, Olive Gray, Slightly Moist, Hydrocarbon Odor		25			100%		486	
						100%		376	
			30	29-30		100%		443	
	CLAY, Olive Gray, Grades to Purple @ 38 ft bgs, Silt @ 34 - 38 ft bgs, Slightly Moist, Hydrocarbon Odor					100%		425	
			35			100%		478	
				36-38		100%		520	
								557	
								411	
								522	
								510	
								548	Bottom of Boring @ 38 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

▼ Depth at Completion

⧖ Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-2
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY CLAY, Moderate Yellowish Brown, Dry, Hydrocarbon Odor @ 9 - 26 ft bgs		0					6	
			5			50%		4	
			10	9-10		50%		689	
			15			50%		683	
			20			50%		633	
			25	25-26		50%		633	
						100%		514	Bottom of Boring @ 28 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

▼ Depth at Completion

▽ Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-3
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry to Slightly Moist, Slight Musty Odor @ 6 ft bgs		0			50%		9	
			5	5-6		50%		87	
			10			50%		10	
			15	15-16		100%		9	
			20			50%		4	
			25			100%		2	
	SILTY CLAY, Moderate Yellowish Brown, Slightly Moist, No Odor			27-28		100%		1	
								1	
								5	
								5	Bottom of Boring @ 28 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-4
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SAND, Moderate Yellowish Brown, Moist, No Odor		0			50%		2	
	SANDY CLAY & SAND, Dark Yellowish Brown, Moist, No Odor		5			50%		4	
			10			100%		1	
								1	
			15			100%		1	
	SAND & CLAYEY SAND, Olive Brown, Moist, Hydrocarbon Odor							606	
				17-18		100%		945	
			20			100%		671	
								537	
						100%		465	
			25					525	
						100%		487	
			30					457	
	SAND, Moderate Yellowish Brown, Slightly Moist, Hydrocarbon Odor					100%		450	
								408	
			35			100%		414	
								367	
	CLAY & SANDY CLAY, Olive Gray, Moist, Hydrocarbon Odor			38.5-39.5				610	Bottom of Boring @ 39.5 ft

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-5
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Slightly Moist, Slight Degraded Hydrocarbon Odor @ 24 - 36 ft bgs		0 5 10 15 20 25 30 35	30-31 35-36		50% 50% 50% 50% 100% 50% 50% 50%		- 8 - 8 - 9 - 9 - 9 8 13 - 74 - 90 - 38	Bottom of Boring @ 36 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/26/2013
Date Completed:	3/26/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-6
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry, No Odor		0			50%		-	
	CLAY, Moderate Yellowish Brown, Moist, No Odor		5			50%		3	
						100%		-	
	SILTY SAND, Moderate Yellowish Brown, to Olive Brown, Moist, Hydrocarbon Odor		10			100%		6	
						100%		6	
			15			100%		343	
	SAND & SILTY SAND, Moderate Yellowish Brown, to Olive Brown, Slightly Moist, Hydrocarbon Odor			17-18		100%		896	
						100%		1032	
			20			100%		1111	
	SILTY/CLAYEY SAND, Light Olive Brown, Moist, No Odor					100%		922	
						100%		995	
			25			100%		921	
						100%		546	
						100%		651	
			30			100%		415	
						100%		430	
						100%		581	
			35	35-36		100%		528	Bottom of Boring @ 36 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/27/2013
Date Completed:	3/27/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-7
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry, No Odor		0			100%		1	
			5			100%		1	
			10			100%		0	
								0	
								0	
								0	
								1	
	SAND, Moderate Yellowish Brown, Dry, No Odor		15			100%		1	
								1	
								1	
	SILTY SAND, Moderate Yellowish Brown, Slightly Moist, No Odor		20			100%		2	
								22	
								7	
			25			100%		5	
								14	
								9	
			30			100%		12	
								12	
				33-34				12	
			35			100%		56	
	SILTY CLAY, Moderate Yellowish Brown, Dry, Hydrocarbon Odor							87	
			40	39-40				976	Bottom of Boring @ 40 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/27/2013
Date Completed:	3/27/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-8
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry, No Odor		0			100%		3	
			5			100%		3	
			10			100%		1	
			15			100%		3	
			20			100%		2	
	SILTY CLAY, Moderate Yellowish Brown, Dry, No Odor		25			50%		1	
	SANDY SILT & CLAY, Moderate Yellowish Brown, Sandstone Fragments @ 34 ft bgs, Dry, No Odor		30			100%		1	
			35			100%		1	
			40			100%		2	
						100%		1	
						100%		0	
						100%		0	
						100%		48	
						100%		99	
				41-42		100%		418	
	SILTY CLAY, Reddish Purple, Slightly Moist, Hydrocarbon Odor			43-44		100%		374	Bottom of Boring @ 44 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/27/2013
Date Completed:	3/27/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-9
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SAND & SILTY SAND, Moderate Yellowish Brown, Dry, No Odor		0			100%		1	
			5			100%		3	
			10			100%		1	
			15			100%		1	
			20			100%		1	
	WEATHERED SANDSTONE, Moderate Yellowish Brown, Cobbles, Dry, No Odor		25			50%		1	
	SILTY CLAY, Moderate Yellowish Brown, Dry, No Odor		30			100%		1	
	SILTY CLAY, Red with Gray Mottling, Dry, No Odor		35			100%		1	
	SILTY CLAY, Gray, Dry, Slight Hydrocarbon Odor @ 38 ft bgs			37-38		100%		1	
								3	
								148	Bottom of Boring @ 38 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/27/2013
Date Completed:	3/27/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

- Depth at Completion
- Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-10
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry @ 4 ft bgs, No Odor		0–15			100%, 75%, 100%, 100%, 100%		1, 1, -, 1, 1, 1, 0, 0, 0	
	SILTY CLAY, Moderate Yellowish Brown, Slightly Moist, No Odor		15–20			100%		0	
	CLAY, Moderate Brown, Stiff, Slightly Moist, No Odor to Slight Hydrocarbon Odor		20–25			50%		43, 154	
	SAND, Moderate Yellowish Brown, Slightly Moist, Slight Hydrocarbon Odor		25–30			100%		117, 323	
	CLAY & SILTY SANDY CLAY, Moderate Brown, Slightly Moist, Hydrocarbon Odor		30–35			100%		340, 143	
	CLAYEY SAND, Moderate Yellowish Brown to Olive Brown, Moist, Hydrocarbon Odor		35	35-36		100%		64, 823	Bottom of Borign @ 36 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Client:	Williams Four Corners
Project:	Lowery Tank
Project Location:	Rio Arriba County, NM
Project Manager:	K. Summers

DRILLING & SAMPLING INFORMATION

Date Started:	3/27/2013
Date Completed:	3/27/2013
Drilling Company:	Earth Worx
Driller:	L. Trujillo
Boring Method:	Direct Push
Geologist:	K. Summers
Bore Hole Diamter:	2.5"
Sampler Type:	NA

GROUNDWATER DEPTH

▼ Depth at Completion

▼ Depth at Stabilization

SOIL BORING LOG

Soil Boring Number:	SB-11
Project Number:	0413G001
Drawn By:	RDH
Approved by:	KS

WELL CONSTRUCTION INFORMATION

Well Diameter:	NA
Screen Size:	NA
Screen Length:	NA
Casing Length:	NA
Surface Completion:	NA

MONITORING WELL CONSTRUCTION DETAIL	SOIL CLASSIFICATION	STRATUM	DEPTH	SAMPLE NUMBER	SAMPLE INTERVAL	RECOVERY	GROUNDWATER DEPTH	PID (ppm)	COMMENTS
	SILTY SAND, Moderate Yellowish Brown, Dry, No Odor		0			100%		1	
			5			100%		1	
			10			100%		0	
	SILTY CLAY, Moderate Yellowish Brown, Slightly Moist & Slight Hydrocarbon Odor @ 22 - 24 ft bgs		15			100%		0	
			20			50%		0	
	CLAYEY SAND, Moderate Yellowish Brown, Slightly Moist, Hydrocarbon Odor		25			100%		11	
			30	31-32		100%		44	
	SILTY CLAY, Olive Gray, Moist, Hydrocarbon Odor		35	35-36		100%		61	
								73	
								175	
								239	
								829	
								397	
								432	Bottom of Boring @ 36 ft bgs

NOTE: This log is not to be used outside the original report.

Southwest GEOSCIENCE

Apex TITAN, Inc.
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A Subsidiary of Apex Companies, LLC

Client: WFC
Project Name: Lowery Tank Battery
Project Location: Rural Rio Arriba County, New Mexico
Project Manager: Kyle Summers

BORING LOG NUMBER
SB-12
Project # 7030413G001

Date Sampled: March 10, 2014
Drilled by: Earth Worx
Driller: L. Trujillo
Logged by: K. Summers
Sampler: K. Summers

Ground Surface Elevation: N/A
Top of Casing Elevation: N/A
North Coordinate: -
West Coordinate: -
Bench Mark Elevation: N/A
▽ At Completion
▽ At Well Stabilization

Borehole Diameter: 2"
Casing Diameter: -
Well Materials: -
Surface Completion: -
Boring Method: Geoprobe

DEPTH (ft)	SAMPLE INTERVAL	SAMPLE ID	RECOVERY (%)	FID/PID READING (ppm)	POTENTIO-METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING / WELL COMPLETION (GRAPHIC DEPICTION)
0				-			SILTY SAND: moderate yellowish brown, fine to very fine sand, moist, no hydrocarbon odor	
				0				
				-				
				0				
5				-				
				0				
				-			SILTY CLAY: moderate yellowish brown, moist, no hydrocarbon odor, 50% silt	
				0			SILTY SAND: moderate yellowish brown, fine to very fine sand, moist, no hydrocarbon odor	
				-				
10				0				
				-			SANDY CLAY/SILTY CLAY: fine to very fine sand, slight moist to dry, no hydrocarbon odor	
				0				
				-			-dry	
				0				
15				-				
				0				
				-				
				0				
				-				
20				0			-moist	
				-				
				20				
				-				
				170				
				-			SILTY SANDY CLAY: moderate yellowish brown, slightly moist, very fine sand and silt @ 30% to 40%	
25				485				
				-				
				747			-slight hydrocarbon odor, strong hydrocarbon odor below 28'	
				-			-grayish 28 to 32'	
				987				
30	X	30-32		-				
				987				
							TOTAL DEPTH OF BORING - 32.0 feet BGS	
35								
40								

Hydrated Bentonite

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Phone: (505) 334-5200
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Client: WFC
Project Name: Lowery Tank Battery
Project Location: Rural Rio Arriba County, New Mexico
Project Manager: Kyle Summers

BORING LOG NUMBER
SB-13
Project # 7030413G001

Date Sampled: March 10, 2014
Drilled by: Earth Worx
Driller: L. Trujillo
Logged by: K. Summers
Sampler: K. Summers

Ground Surface Elevation: N/A
Top of Casing Elevation: N/A
North Coordinate: -
West Coordinate: -
Bench Mark Elevation: N/A
▽ At Completion
▽ At Well Stabilization

Borehole Diameter: 2"
Casing Diameter: -
Well Materials: -
Surface Completion: -
Boring Method: Geoprobe

DEPTH (ft)	SAMPLE INTERVAL	SAMPLE ID	RECOVERY (%)	FID/PID READING (ppm)	POTENTIOMETRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING / WELL COMPLETION (GRAPHIC DEPICTION)
0				-			SILTY SAND: moderate yellowish brown, fine to very fine sand, slightly moist, no hydrocarbon odor	Hydrated Bentonite
				2				
				-				
				2			SILTY CLAY: moderate yellowish brown, no hydrocarbon odor	
5				-				
				2			-very moist	
				-			-moist, no hydrocarbon odor	
				2				
				-				
10				2				
				-				
				2				
				-				
				2				
				-			CLAYEY SILTY SAND: moderate yellowish brown, fine to very fine sand, moist, no hydrocarbon odor, very fine sand and silt @ 60%	
15				2				
				-				
				2				
				-				
	X	18-20		2			-sandstone, gray, hard, slightly moist	
20							TOTAL DEPTH OF BORING - 20.0 feet BGS	
25								

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Client: WFC
Project Name: Lowery Tank Battery
Project Location: Rural Rio Arriba County, New Mexico
Project Manager: Kyle Summers

BORING LOG NUMBER
SB-14
Project # 7030413G001

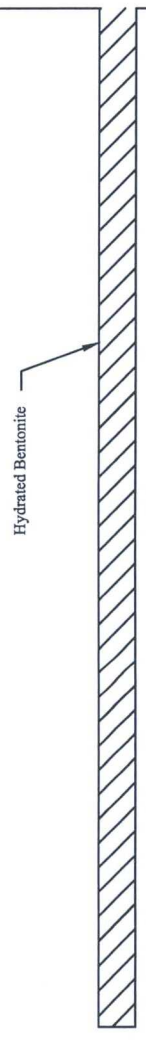
Date Sampled: March 10, 2014
Drilled by: Earth Worx
Driller: L. Trujillo
Logged by: K. Summers
Sampler: K. Summers

Ground Surface Elevation: N/A
Top of Casing Elevation: N/A
North Coordinate: -
West Coordinate: -
Bench Mark Elevation: N/A
At Completion
At Well Stabilization

Borehole Diameter: 2"
Casing Diameter: -
Well Materials: -
Surface Completion: -
Boring Method: Geoprobe

DEPTH (ft)	SAMPLE INTERVAL	SAMPLE ID	RECOVERY (%)	FID/PID READING (ppm)	POTENTIOMETRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION
0				-			SILTY SAND/SILTY CLAY: moderate yellowish brown, fine to very fine sand, moist, no hydrocarbon odor
				1			
				-			
				1			
				-			
				2			
				-			SILTY SAND: moderate yellowish brown, fine to very fine sand, moist, no hydrocarbon odor
				2			
				-			
				1			-very moist @ 10'
10				-			SILTY CLAY: moderate yellowish brown, moist, apparent fire remnants (burned brush)
				1			
				-			
				1			
				-			SILTY CLAY: dry to slightly moist, no hydrocarbon odor until 26.5', anhydrite xtals
				1			
				-			-silty layer (0.5' thick)
				1			
				-			
20				1			
				-			
				1			
				-			
				1			
				-			-sandier (24.5-28')
				1			
				-			
				1			-small stains
				-			
				112			
				-			SILTY CLAY: moderate yellowish brown, slightly moist to moist, hydrocarbon odor
				607			
30				-			
				1,058			
	X	32-34		-			
	X			1,242			
				-			
				872			
				-			
				772			-silt (1' thick at 37'), mostly clay
				-			
				680			
40				-			
				11			
	X	42-44		-			
	X			8			
							TOTAL DEPTH OF BORING - 44.0 feet BGS
50							

BORING / WELL COMPLETION (GRAPHIC DEPICTION)



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Client: WFC
Project Name: Lowery Tank Battery
Project Location: Rural Rio Arriba County, New Mexico
Project Manager: Kyle Summers

BORING LOG NUMBER
SB-15
Project # 7030413G001

Date Sampled: March 10, 2014
Drilled by: Earth Worx
Driller: L. Trujillo
Logged by: K. Summers
Sampler: K. Summers

Ground Surface Elevation: N/A
Top of Casing Elevation: N/A
North Coordinate: -
West Coordinate: -
Bench Mark Elevation: N/A
▽ At Completion
▽ At Well Stabilization

Borehole Diameter: 2"
Casing Diameter: -
Well Materials: -
Surface Completion: -
Boring Method: Geoprobe

DEPTH (ft)	SAMPLE INTERVAL	SAMPLE ID	RECOVERY (%)	FID/PID READING (ppm)	POTENTIOMETRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING / WELL COMPLETION (GRAPHIC DEPICTION)
0				-			SILTY SAND: moderate yellowish brown, fine to very fine sand, dry, no hydrocarbon odor	
				2				
				-				
				2				
5				-				
				2				
				-				
				2				
				-				
10				2				
				-				
				2				
				-				
				2				
15				-				
				2				
				-				
				2				
				-			SILTY CLAY: moderate yellowish brown, dry to slightly moist, no hydrocarbon odor until 27', anhydrite xtals	
20				2				
				-				
				2				
				-				
				2				
25				-				
				14				
				-				
				234				
				-				
				621				
30				-			SILTY CLAY: moderate yellowish brown, slightly moist to moist -hydrocarbon odor	
				730				
	X	32-34		-				
	X			952				
				-				
35				690				
				-				
				463				
	X	38-40		-				
	X			271			-less silt, more clay	
40							TOTAL DEPTH OF BORING - 40.0 feet BGS	

Hydrated Bentonite

Z:\Houston South\Drafting\New Mexico 04\2013\7010413G001\logs\Boring Logs.dwg 06/17/15

APEX

APPENDIX D

Laboratory Analytical Reports & Chain of Custody Documentation

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

November 26, 2013

Kyle Summers
Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX

RE: Lowery Tank OrderNo.: 1311884

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 4 sample(s) on 11/20/2013 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 qualifers 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 **1311884**
Date Reported: **11/26/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: Conf-1
Project: Lowery Tank
Collection Date: 11/14/2013 1:00:00 PM
Lab ID: 1311884-001 **Matrix:** SOIL **Received Date:** 11/20/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/22/2013 9:44:12 AM	10459
Surr: DNOP	88.4	66-131		%REC	1	11/22/2013 9:44:12 AM	10459
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/22/2013 1:22:48 PM	10465
Surr: BFB	92.2	74.5-129		%REC	1	11/22/2013 1:22:48 PM	10465
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.049		mg/Kg	1	11/22/2013 1:22:48 PM	10465
Toluene	ND	0.049		mg/Kg	1	11/22/2013 1:22:48 PM	10465
Ethylbenzene	ND	0.049		mg/Kg	1	11/22/2013 1:22:48 PM	10465
Xylenes, Total	ND	0.098		mg/Kg	1	11/22/2013 1:22:48 PM	10465
Surr: 4-Bromofluorobenzene	110	80-120		%REC	1	11/22/2013 1:22:48 PM	10465

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: Conf-2
Project: Lowery Tank
Collection Date: 11/15/2013 8:45:00 AM
Lab ID: 1311884-002 **Matrix:** SOIL **Received Date:** 11/20/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	11/22/2013 10:49:36 AM	10459
Surr: DNOP	122	66-131		%REC	1	11/22/2013 10:49:36 AM	10459
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/22/2013 1:51:26 PM	10465
Surr: BFB	92.7	74.5-129		%REC	1	11/22/2013 1:51:26 PM	10465
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.048		mg/Kg	1	11/22/2013 1:51:26 PM	10465
Toluene	ND	0.048		mg/Kg	1	11/22/2013 1:51:26 PM	10465
Ethylbenzene	ND	0.048		mg/Kg	1	11/22/2013 1:51:26 PM	10465
Xylenes, Total	ND	0.097		mg/Kg	1	11/22/2013 1:51:26 PM	10465
Surr: 4-Bromofluorobenzene	111	80-120		%REC	1	11/22/2013 1:51:26 PM	10465

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Project: Lowery Tank
Lab ID: 1311884-003 **Matrix:** SOIL

Client Sample ID: Conf-3
Collection Date: 11/18/2013 10:00:00 AM
Received Date: 11/20/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	11/22/2013 11:11:29 AM	10459
Surr: DNOP	93.4	66-131		%REC	1	11/22/2013 11:11:29 AM	10459
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/22/2013 2:20:01 PM	10465
Surr: BFB	90.2	74.5-129		%REC	1	11/22/2013 2:20:01 PM	10465
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.048		mg/Kg	1	11/22/2013 2:20:01 PM	10465
Toluene	ND	0.048		mg/Kg	1	11/22/2013 2:20:01 PM	10465
Ethylbenzene	ND	0.048		mg/Kg	1	11/22/2013 2:20:01 PM	10465
Xylenes, Total	ND	0.096		mg/Kg	1	11/22/2013 2:20:01 PM	10465
Surr: 4-Bromofluorobenzene	106	80-120		%REC	1	11/22/2013 2:20:01 PM	10465

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: Conf-4
Project: Lowery Tank
Collection Date: 11/18/2013 1:10:00 PM
Lab ID: 1311884-004 **Matrix:** SOIL **Received Date:** 11/20/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/22/2013 11:56:52 AM	10459
Surr: DNOP	103	66-131		%REC	1	11/22/2013 11:56:52 AM	10459
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	11/22/2013 2:48:38 PM	10465
Surr: BFB	92.3	74.5-129		%REC	1	11/22/2013 2:48:38 PM	10465
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.047		mg/Kg	1	11/22/2013 2:48:38 PM	10465
Toluene	ND	0.047		mg/Kg	1	11/22/2013 2:48:38 PM	10465
Ethylbenzene	ND	0.047		mg/Kg	1	11/22/2013 2:48:38 PM	10465
Xylenes, Total	ND	0.094		mg/Kg	1	11/22/2013 2:48:38 PM	10465
Surr: 4-Bromofluorobenzene	110	80-120		%REC	1	11/22/2013 2:48:38 PM	10465

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1311884**

26-Nov-13

Client: Southwest Geoscience

Project: Lowery Tank

Sample ID **MB-10435**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **10435**	RunNo: **14949**
Prep Date: **11/20/2013**	Analysis Date: **11/21/2013**	SeqNo: **431804** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.9		10.00		98.6	66	131			

Sample ID **LCS-10435**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **10435**	RunNo: **14949**
Prep Date: **11/20/2013**	Analysis Date: **11/21/2013**	SeqNo: **432076** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.4		5.000		88.5	66	131			

Sample ID **MB-10459**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **10459**	RunNo: **14949**
Prep Date: **11/21/2013**	Analysis Date: **11/21/2013**	SeqNo: **432083** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Surr: DNOP	8.5		10.00		84.9	66	131			

Sample ID **LCS-10459**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **10459**	RunNo: **14949**
Prep Date: **11/21/2013**	Analysis Date: **11/21/2013**	SeqNo: **432084** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	10	50.00	0	111	62.1	127			
Surr: DNOP	4.9		5.000		97.0	66	131			

Sample ID **1311884-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **Conf-1**	Batch ID: **10459**	RunNo: **14985**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **432659** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.20	0	95.8	47.4	148			
Surr: DNOP	4.8		5.020		95.1	66	131			

Sample ID **1311884-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **Conf-1**	Batch ID: **10459**	RunNo: **14985**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **432680** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.15	0	100	47.4	148	4.71	22.7	
Surr: DNOP	5.0		5.015		100	66	131	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1311884**

26-Nov-13

Client: Southwest Geoscience

Project: Lowery Tank

Sample ID **MB-10465**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **10465**	RunNo: **14998**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **434062** 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	920		1000		92.3	74.5	129			

Sample ID **LCS-10465**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **10465**	RunNo: **14998**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **434063** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.3	74.5	126			
Surr: BFB	1000		1000		100	74.5	129			

Sample ID **1311884-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Conf-2**	Batch ID: **10465**	RunNo: **14998**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **434066** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	4.8	24.20	0	115	76	156			
Surr: BFB	970		968.1		100	74.5	129			

Sample ID **1311884-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Conf-2**	Batch ID: **10465**	RunNo: **14998**
Prep Date: **11/21/2013**	Analysis Date: **11/22/2013**	SeqNo: **434067** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	4.8	24.13	0	113	76	156	1.73	17.7	
Surr: BFB	960		965.3		99.7	74.5	129	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1311884**

26-Nov-13

Client: Southwest Geoscience

Project: Lowery Tank

Sample ID **MB-10465** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **10465** RunNo: **14998**

Prep Date: **11/21/2013** Analysis Date: **11/22/2013** SeqNo: **434092** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		111	80	120			

Sample ID **LCS-10465** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **10465** RunNo: **14998**

Prep Date: **11/21/2013** Analysis Date: **11/22/2013** SeqNo: **434093** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.050	1.000	0	99.0	80	120			
Toluene	0.97	0.050	1.000	0	96.9	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.1	0.10	3.000	0	104	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		117	80	120			

Sample ID **1311884-001AMS** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **Conf-1** Batch ID: **10465** RunNo: **14998**

Prep Date: **11/21/2013** Analysis Date: **11/22/2013** SeqNo: **434095** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.049	0.9756	0	113	67.3	145			
Toluene	1.1	0.049	0.9756	0.006585	110	66.8	144			
Ethylbenzene	1.2	0.049	0.9756	0	121	61.9	153			
Xylenes, Total	3.6	0.098	2.927	0	123	65.8	149			
Surr: 4-Bromofluorobenzene	1.2		0.9756		118	80	120			

Sample ID **1311884-001AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **Conf-1** Batch ID: **10465** RunNo: **14998**

Prep Date: **11/21/2013** Analysis Date: **11/22/2013** SeqNo: **434096** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.049	0.9775	0	99.1	67.3	145	12.9	20	
Toluene	0.96	0.049	0.9775	0.006585	97.6	66.8	144	11.9	20	
Ethylbenzene	1.0	0.049	0.9775	0	105	61.9	153	14.3	20	
Xylenes, Total	3.1	0.098	2.933	0	106	65.8	149	14.9	20	
Surr: 4-Bromofluorobenzene	1.1		0.9775		114	80	120	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

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: Southwest Geoscience A Work Order Number: 1311884 RcptNo: 1

Received by/date: MB/AT 11/20/13

Logged By: Anne Thorne 11/20/2013 10:00:00 AM Anne Thorne

Completed By: Anne Thorne 11/20/2013 Anne Thorne

Reviewed By: AT 11/20/13 /IO 11/21/2013

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

CHAIN OF CUSTODY RECORD

Southwest GEOSCIENCE
Environmental & Hydrogeologic Consultants

Office Location: Aztec
Project Manager: Summers

Laboratory: Hall
Address: ABQ
Contact: Freeman
Phone:
PO/SO #:

Sampler's Name: Kyle Summers
Sampler's Signature:

Proj. No: 04136001
Project Name: Lowery Tank

Lab use only
Due Date:
Temp. of coolers when received (C°): 1.0
1 | 2 | 3 | 4 | 5
Page 1 of 1

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No/Type of Containers: VOA	A/G 1 Lt.	250 ml	P/O	ANALYSIS REQUESTED: BTEX 8021	TPH 8015 GRO DRO	Lab Sample ID (Lab Use Only)
S	11/14/13	1300		X	Conf-1		12'				1	X	X	1311884-001
↓	11/15/13	0845		↓	Conf-2		↓				↓	↓	↓	-002
	11/18/13	1000			Conf-3									-003
↓	11/18/13	1310		↓	Conf-4		↓				↓	↓	↓	-004

NFS
KS

Turn around time: ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	11/19/13	1148	Christie Walker	11/19/13	1148
Christie Walker	11/19/13	1754		11/20/13	1000

NOTES: Bill Williams Four Corners

Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - sludge; O - Oil
Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other

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

March 20, 2014

Kyle Summers
Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX (214) 350-2914

RE: Lowery Tank Battery OrderNo.: 1403547

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 6 sample(s) on 3/12/2014 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 qualifers 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 **1403547**
Date Reported: **3/20/2014**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Project: Lowery Tank Battery
Lab ID: 1403547-001 **Matrix:** SOIL

Client Sample ID: SB-12 (32")
Collection Date: 3/10/2014 11:00:00 AM
Received Date: 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	130	10		mg/Kg	1	3/17/2014 7:10:20 PM	12173
Surr: DNOP	107	66-131		%REC	1	3/17/2014 7:10:20 PM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	2600	240		mg/Kg	50	3/17/2014 10:28:57 PM	12163
Surr: BFB	115	74.5-129		%REC	50	3/17/2014 10:28:57 PM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	13	2.4		mg/Kg	50	3/17/2014 10:28:57 PM	12163
Toluene	85	2.4		mg/Kg	50	3/17/2014 10:28:57 PM	12163
Ethylbenzene	7.3	2.4		mg/Kg	50	3/17/2014 10:28:57 PM	12163
Xylenes, Total	76	4.9		mg/Kg	50	3/17/2014 10:28:57 PM	12163
Surr: 4-Bromofluorobenzene	109	80-120		%REC	50	3/17/2014 10:28:57 PM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	ND	7.5		mg/Kg	5	3/18/2014 8:36:11 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	2400	200		mg/Kg	10	3/17/2014	12172

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Project: Lowery Tank Battery
Lab ID: 1403547-002 **Matrix:** SOIL

Client Sample ID: SB-13 (20')
Collection Date: 3/10/2014 12:10:00 PM
Received Date: 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	3/14/2014 11:18:44 PM	12173
Surr: DNOP	101	66-131		%REC	1	3/14/2014 11:18:44 PM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/17/2014 10:57:30 PM	12163
Surr: BFB	87.3	74.5-129		%REC	1	3/17/2014 10:57:30 PM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.049		mg/Kg	1	3/17/2014 10:57:30 PM	12163
Toluene	ND	0.049		mg/Kg	1	3/17/2014 10:57:30 PM	12163
Ethylbenzene	ND	0.049		mg/Kg	1	3/17/2014 10:57:30 PM	12163
Xylenes, Total	ND	0.098		mg/Kg	1	3/17/2014 10:57:30 PM	12163
Surr: 4-Bromofluorobenzene	99.6	80-120		%REC	1	3/17/2014 10:57:30 PM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	ND	7.5		mg/Kg	5	3/18/2014 9:50:39 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	3/17/2014	12172

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Project: Lowery Tank Battery
Lab ID: 1403547-003 **Matrix:** SOIL

Client Sample ID: SB-14 (34')
Collection Date: 3/10/2014 1:45:00 PM
Received Date: 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	210	10		mg/Kg	1	3/17/2014 8:16:38 PM	12173
Surr: DNOP	107	66-131		%REC	1	3/17/2014 8:16:38 PM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1900	240		mg/Kg	50	3/17/2014 11:26:09 PM	12163
Surr: BFB	112	74.5-129		%REC	50	3/17/2014 11:26:09 PM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	11	2.4		mg/Kg	50	3/17/2014 11:26:09 PM	12163
Toluene	57	2.4		mg/Kg	50	3/17/2014 11:26:09 PM	12163
Ethylbenzene	5.1	2.4		mg/Kg	50	3/17/2014 11:26:09 PM	12163
Xylenes, Total	51	4.8		mg/Kg	50	3/17/2014 11:26:09 PM	12163
Surr: 4-Bromofluorobenzene	109	80-120		%REC	50	3/17/2014 11:26:09 PM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	ND	7.5		mg/Kg	5	3/18/2014 10:15:28 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	2000	200		mg/Kg	10	3/17/2014	12172

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Project: Lowery Tank Battery
Lab ID: 1403547-004 **Matrix:** SOIL

Client Sample ID: SB-14 (44')
Collection Date: 3/10/2014 2:00:00 PM
Received Date: 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/15/2014 12:02:40 AM	12173
Surr: DNOP	104	66-131		%REC	1	3/15/2014 12:02:40 AM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/17/2014 11:54:43 PM	12163
Surr: BFB	86.7	74.5-129		%REC	1	3/17/2014 11:54:43 PM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.047		mg/Kg	1	3/17/2014 11:54:43 PM	12163
Toluene	ND	0.047		mg/Kg	1	3/17/2014 11:54:43 PM	12163
Ethylbenzene	ND	0.047		mg/Kg	1	3/17/2014 11:54:43 PM	12163
Xylenes, Total	ND	0.095		mg/Kg	1	3/17/2014 11:54:43 PM	12163
Surr: 4-Bromofluorobenzene	99.0	80-120		%REC	1	3/17/2014 11:54:43 PM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	11	7.5		mg/Kg	5	3/18/2014 10:40:18 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	3/17/2014	12172

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: SB-15 (34')
Project: Lowery Tank Battery
Collection Date: 3/10/2014 4:00:00 PM
Lab ID: 1403547-005 **Matrix:** SOIL **Received Date:** 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	1100	99		mg/Kg	10	3/17/2014 8:38:44 PM	12173
Surr: DNOP	0	66-131	S	%REC	10	3/17/2014 8:38:44 PM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	9000	490		mg/Kg	100	3/18/2014 12:23:15 AM	12163
Surr: BFB	135	74.5-129	S	%REC	100	3/18/2014 12:23:15 AM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	55	4.9		mg/Kg	100	3/18/2014 12:23:15 AM	12163
Toluene	290	4.9		mg/Kg	100	3/18/2014 12:23:15 AM	12163
Ethylbenzene	24	4.9		mg/Kg	100	3/18/2014 12:23:15 AM	12163
Xylenes, Total	250	9.9		mg/Kg	100	3/18/2014 12:23:15 AM	12163
Surr: 4-Bromofluorobenzene	108	80-120		%REC	100	3/18/2014 12:23:15 AM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	ND	7.5		mg/Kg	5	3/18/2014 11:05:08 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	11000	2000		mg/Kg	100	3/17/2014	12172

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: SB-15 (40')
Project: Lowery Tank Battery
Collection Date: 3/10/2014 4:30:00 PM
Lab ID: 1403547-006 **Matrix:** SOIL **Received Date:** 3/12/2014 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE ORGANICS						Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/15/2014 12:46:18 AM	12173
Surr: DNOP	104	66-131		%REC	1	3/15/2014 12:46:18 AM	12173
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	6.7	4.7		mg/Kg	1	3/18/2014 12:51:57 AM	12163
Surr: BFB	95.2	74.5-129		%REC	1	3/18/2014 12:51:57 AM	12163
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.047		mg/Kg	1	3/18/2014 12:51:57 AM	12163
Toluene	ND	0.047		mg/Kg	1	3/18/2014 12:51:57 AM	12163
Ethylbenzene	ND	0.047		mg/Kg	1	3/18/2014 12:51:57 AM	12163
Xylenes, Total	ND	0.095		mg/Kg	1	3/18/2014 12:51:57 AM	12163
Surr: 4-Bromofluorobenzene	98.6	80-120		%REC	1	3/18/2014 12:51:57 AM	12163
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	ND	7.5		mg/Kg	5	3/18/2014 11:29:58 AM	12222
EPA METHOD 418.1: TPH						Analyst: **BCN**	
Petroleum Hydrocarbons, TR	110	20		mg/Kg	1	3/17/2014	12172

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403547**

20-Mar-14

Client: Southwest Geoscience

Project: Lowery Tank Battery

Sample ID	**MB-12222**	SampType: **MBLK**			TestCode: **EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID: **12222**			RunNo: **17414**					
Prep Date:	**3/18/2014**	Analysis Date: **3/18/2014**			SeqNo: **501540**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-12222**	SampType: **LCS**			TestCode: **EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID: **12222**			RunNo: **17414**					
Prep Date:	**3/18/2014**	Analysis Date: **3/18/2014**			SeqNo: **501541**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.0	90	110			

Sample ID	**1403547-001AMS**	SampType: **MS**			TestCode: **EPA Method 300.0: Anions**					
Client ID:	**SB-12 (32")**	Batch ID: **12222**			RunNo: **17414**					
Prep Date:	**3/18/2014**	Analysis Date: **3/18/2014**			SeqNo: **501547**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	18	7.5	15.00	4.746	87.3	71.3	115			

Sample ID	**1403547-001AMSD**	SampType: **MSD**			TestCode: **EPA Method 300.0: Anions**					
Client ID:	**SB-12 (32")**	Batch ID: **12222**			RunNo: **17414**					
Prep Date:	**3/18/2014**	Analysis Date: **3/18/2014**			SeqNo: **501548**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	18	7.5	15.00	4.746	87.8	71.3	115	0.425	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403547**

20-Mar-14

Client: Southwest Geoscience

Project: Lowery Tank Battery

Sample ID **MB-12172**	SampType: **MBLK**	TestCode: **EPA Method 418.1: TPH**
Client ID: **PBS**	Batch ID: **12172**	RunNo: **17320**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **498786** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID **LCS-12172**	SampType: **LCS**	TestCode: **EPA Method 418.1: TPH**
Client ID: **LCSS**	Batch ID: **12172**	RunNo: **17320**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **498795** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	100	20	100.0	0	104	80	120			

Sample ID **LCSD-12172**	SampType: **LCSD**	TestCode: **EPA Method 418.1: TPH**
Client ID: **LCSS02**	Batch ID: **12172**	RunNo: **17320**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **498802** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	100	20	100.0	0	99.6	80	120	4.19	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403547**

20-Mar-14

Client: Southwest Geoscience

Project: Lowery Tank Battery

Sample ID **MB-12173**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **12173**	RunNo: **17309**
Prep Date: **3/13/2014**	Analysis Date: **3/14/2014**	SeqNo: **499649** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Surr: DNOP	8.4		10.00		83.6	66	131			

Sample ID **1403547-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **SB-12 (32")**	Batch ID: **12173**	RunNo: **17357**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500543** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	370	9.9	49.55	128.9	492	47.4	148			S
Surr: DNOP	5.9		4.955		118	66	131			

Sample ID **1403547-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **SB-12 (32")**	Batch ID: **12173**	RunNo: **17357**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500553** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	340	10	49.75	128.9	429	47.4	148	8.44	22.7	S
Surr: DNOP	5.9		4.975		119	66	131	0	0	

Sample ID **LCS-12173**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **12173**	RunNo: **17357**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500720** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	101	60.8	145			
Surr: DNOP	5.0		5.000		99.3	66	131			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403547**

20-Mar-14

Client: Southwest Geoscience

Project: Lowery Tank Battery

Sample ID **MB-12163**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **12163**	RunNo: **17371**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500261** 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	870		1000		87.2	74.5	129			

Sample ID **LCS-12163**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **12163**	RunNo: **17371**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500262** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	71.7	134			
Surr: BFB	930		1000		92.7	74.5	129			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403547**

20-Mar-14

Client: Southwest Geoscience

Project: Lowery Tank Battery

Sample ID **MB-12163**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **12163**	RunNo: **17371**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500288** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		102	80	120			

Sample ID **LCS-12163**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **12163**	RunNo: **17371**
Prep Date: **3/13/2014**	Analysis Date: **3/17/2014**	SeqNo: **500289** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.050	1.000	0	97.4	80	120			
Toluene	0.96	0.050	1.000	0	96.5	80	120			
Ethylbenzene	0.97	0.050	1.000	0	97.5	80	120			
Xylenes, Total	3.0	0.10	3.000	0	98.5	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		107	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

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: Southwest Geoscience Work Order Number: 1403547 RcptNo: 1

Received by/date: LM 03/12/14

Logged By: **Michelle Garcia** 3/12/2014 10:00:00 AM Michelle Garcia

Completed By: **Michelle Garcia** 3/13/2014 12:00:43 PM Michelle Garcia

Reviewed By: 03/13/14

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

CHAIN OF CUSTODY RECORD

Southwest GEOSCIENCE
Environmental & Hydrogeologic Consultants

Office Location: AZTEC, NM
Project Manager: KYLE SUMNERS

Laboratory: HALL
Address: ABQ
Contact: FREEMAN
Phone:
PO/SO #: 04136001

Sampler's Name: AARON BRYANT, KYLE SUMNERS
Sampler's Signature:

Proj. No.: 04136001
Project Name: LOURY TANK BATTERY
No/Type of Containers: 4 OZ

ANALYSIS REQUESTED: BTEX 8021, TPH 8015 DRO/GRO, TPH 418.1, CHLORIDES

Lab use only
Due Date:
Temp. of coolers when received (C°): 1.2
Page 1 of 1

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	BTEX	TPH 8015	TPH 418.1	CHLORIDES	Lab Sample ID (Lab Use Only)
S	3-10-14	1100		X	SB-12 (32')						1	X	X	X	X	1403547-001
S	3-10-14	1210		X	SB-13 (20')						1	X	X	X	X	002
S	3-10-14	1345		X	SB-14 (34')						1	X	X	X	X	003
S	3-10-14	1400		X	SB-14 (44')						1	X	X	X	X	004
S	3-10-14	1600		X	SB-15 (34')						1	X	X	X	X	005
S	3-10-14	1630		X	SB-15 (46')						1	X	X	X	X	006

NFS
AB

Turn around time: ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	3/11/14	1415	Heather Walker	3/11/14	1415
Heather Walker	3/11/14	1744		03/12/14	1000

NOTES: Williams 4 Corners

Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - sludge; O - Oil
Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other