



November 20, 2020

Vertex Project #: 20E-00141-019

**Spill Closure Report:** Thistle Unit #048H  
Unit N, Section 34, Township 23 South, Range 33 East  
County: Lea  
API 30-0254-41253  
Incident Tracking Number: NRM1929549356

**Prepared For:** Devon Energy Production Company  
6488 Seven Rivers Highway  
Artesia, New Mexico 88210

**New Mexico Oil Conservation Division – District 1 – Hobbs**

1625 North French Drive  
Hobbs, New Mexico 88240

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a produced water release that occurred on September 8, 2019, at Thistle Unit #048H (hereafter referred to as “Thistle 48”). Devon provided notification of the release to New Mexico Oil Conservation Division (NM OCD) District 1 and the New Mexico State Land Office (SLO), who own the land, on September 13, 2019, via submission of an initial C-141 Release Notification (Attachment 1). The NM OCD tracking number assigned to this incident is NRM1929549356.

This letter provides a description of the spill assessment and remediation activities, and demonstrates that closure criteria established in 19.15.29.12 *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) have been met and all applicable regulations are being followed. This document is intended to serve as the final report to obtain approval from NM OCD for closure of this release.

## Incident Description

On September 8, 2019, a release occurred at Devon’s Thistle 48 site when a valve on a stuffing box was left open. This incident resulted in the release of approximately 6.06 barrels (bbls) of produced water onto the wellpad. Upon discovery of the incident, the valve was closed to stop the release. No produced water was recovered from the impacted area. The spill was contained on-lease; no produced water was released into undisturbed areas or waterways.

## Site Characterization

The release at Thistle 48 occurred on state-owned land, N 32.2546959, W 103.5604095, approximately 24 miles northwest of Jal, New Mexico. The legal description for the site is Unit N, Section 34, Township 23 South, Range 33 East, Lea County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production, and rangeland. An aerial photograph and site schematic are included in Attachment 2 (Figure 1).

[vertex.ca](http://vertex.ca)

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3101 Boyd Drive, Carlsbad, New Mexico 88220 | P 575.725.5001

Thistle 48 is typical of oil and gas exploration and production sites in the western portion of the Permian Basin, and is currently used for oil and gas production, and storage. The following sections specifically describe the area surrounding the constructed wellpad.

The surrounding landscape is associated with plains and sandy eolian deposits at elevations of 3,000 to 3,900 feet above sea level. The climate is semi-arid, with average annual precipitation ranging between 10 and 12 inches. The plant community has historically had the aspect of a grassland/shrub mix, dominated by dropseed grass species, bluestems and black grama, with mesquite, scattered shinnery oak and sand sage common throughout. Bare ground and litter make up between 20 to 25 percent of the ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted wellpad.

*The Geological Map of New Mexico* indicates the surface geology at Thistle 48 is comprised primarily of Qep – interlaid eolian sands and piedmont-slope deposits from the Holocene to middle Pleistocene ages (New Mexico Bureau of Geology and Mineral Resources, 2020). The National Resources Conservation Service Web Soil Survey characterizes the soil at the site as Berino-Cacique loamy fine sands, which are comprised of fine sand over deep layers of sandy clay loam. This type of soil tends to be well-drained with low runoff and moderate available moisture in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2020). There is low potential for karst geology to be present near Thistle 48 (United States Department of the Interior, Bureau of Land Management, 2020).

There is no surface water located at Thistle 48. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 1.1 miles southwest of the site (United States Fish and Wildlife Service, 2020). At Thistle 48, there are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest recent well to Thistle 48 is a New Mexico Office of the State Engineer well from 2013 located approximately 1.2 miles north of the release. Data for that well show a depth to groundwater of 400 feet below ground surface (bgs; New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2020). A United States Geologic Survey well, located approximately 1.9 miles northeast of Thistle 48, shows a depth to groundwater of 190 feet bgs (United States Department of the Interior, United States Geologic Survey, 2020). Documentation pertaining to site characterization and depth to groundwater determination is included in Attachment 3.

## Closure Criteria Determination

Using site characterization information, a closure criteria determination worksheet (Attachment 3) was completed to determine if the release is subject to any of the special case scenarios outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Based on data included in the closure criteria determination worksheet, the release at Thistle 48 is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC. As the nearest groundwater well is farther than 0.5 miles from the release site, the depth to groundwater at Thistle 48 cannot be accurately determined. The closure criteria for the site are determined to be associated with the following constituent concentration limits.

Devon Energy Production Company  
Thistle Unit #048H

2020 Spill Assessment and Closure  
November 2020

<b>Depth to Groundwater</b>	<b>Constituent</b>	<b>Limit</b>
<50 feet	Chloride	600 mg/kg
	TPH <sup>1</sup> (GRO + DRO + MRO)	100 mg/kg
	BTEX <sup>2</sup>	50 mg/kg
	Benzene	10 mg/kg

<sup>1</sup>Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)

<sup>2</sup>Benzene, toluene, ethylbenzene and xylenes (BTEX)

## Remedial Actions

An initial spill inspection, completed by Vertex on March 18 2020, identified and mapped the boundaries of the release using field screening methods, including a photoionization detector (PID) to determine the presence of volatile organics, the Petroflag system to estimate the level of hydrocarbons and an electroconductivity (EC) meter to approximate chloride levels in the soil. Daily Field Reports (DFRs) and field screening data associated with the site visit are included in Attachment 4. Additional release delineation was completed on June 9, 2020. The release was delineated as presented on Figure 1 (Attachment 2) using initial field screening and soil sampling laboratory data as presented in Table 2 (Attachment 5). The impacted area was determined to be approximately 140 feet long and 132 feet wide; the total affected area was determined to be 4,881 square feet.

On October 20, 2020, Vertex provided 48-hour notification of confirmatory sampling to NM OCD (Attachment 6), as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC. Excavation of impacted soils began on October 21, 2020, with a Vertex representative on-site to conduct field screening to guide the excavation and determine the final horizontal and vertical extents of the excavation area as presented on Figure 2 (Attachment 2). On October 23, 2020, as remediation activities were concluding, Vertex collected a total of 32 five-point composite samples from the base and side walls of the excavation, at depths ranging between 1 and 2 feet bgs. Each composite sample was representative of no more than 200 square feet per the alternate sampling method outlined in Subparagraph (c) of Paragraph (1) of Subsection D 19.15.29.12 NMAC, which does not require prior NM OCD approval. The confirmatory samples were placed into laboratory-provided containers, preserved on ice and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sampling analytical data are summarized in Table 3 (Attachment 5). Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble GPS unit, or equivalent, was used to map the approximate center of each of the five-point composite samples. The confirmatory sampling locations are presented on Figure 2 (Attachment 2). Relevant equipment and prominent features/reference points at the site are mapped as well.

Devon Energy Production Company  
Thistle Unit #048H

2020 Spill Assessment and Closure  
November 2020

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## Closure Request

Vertex recommends no additional remediation action to address the release at Thistle 48. Laboratory analyses of the confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where depth to groundwater is less than 50 feet or cannot be determined. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

The excavation was backfilled with non-waste-containing, uncontaminated earthen material, sourced locally, and placed to meet the site's existing grade to prevent water ponding and erosion.

Vertex requests that this incident (NRM1929549356) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Devon certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NM OCD requirements to obtain closure on the September 8, 2019, release at Thistle 48.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 505.506.0040 or ngordon@vertex.ca.

Sincerely,



Natalie Gordon  
PROJECT MANAGER

## Attachments

- Attachment 1. NM OCD C-141 Initial Notification
- Attachment 2. Figures
- Attachment 3. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
- Attachment 4. Daily Field Report(s) with Photographs
- Attachment 5. Characterization and Confirmatory Sampling Laboratory Results
- Attachment 6. Required 48-hr Notification of Confirmatory Sampling to Regulatory Agencies
- Attachment 7. Laboratory Data Reports/Chain of Custody Forms

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Devon Energy Production Company  
Thistle Unit #048H

2020 Spill Assessment and Closure  
November 2020

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## References

- New Mexico Bureau of Geology and Mineral Resources. (2020). *Interactive Geologic Map*. Retrieved from <http://geoinfo.nmt.edu>.
- New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2020). *Water Column/Average Depth to Water Report*. Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html>
- New Mexico Oil Conservation Division. (2018). *New Mexico Administrative Code – Natural Resources and Wildlife Oil and Gas Releases*. Santa Fe, New Mexico.
- United States Department of Agriculture, Natural Resources Conservation Service. (2020). *Web Soil Survey*. Retrieved from <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.
- United States Department of the Interior, Bureau of Land Management. (2020). *New Mexico Cave/Karsts*. Retrieved from <https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico>.
- United States Department of the Interior, United States Geological Survey. (2020). *National Water Information System*. Retrieved from <https://maps.waterdata.usgs.gov/mapper/index.html?state=nm>
- United States Fish and Wildlife Service. (2020). *National Wetlands Inventory*. Retrieved from <https://www.fws.gov/wetlands/data/Mapper.html>

Devon Energy Production Company  
Thistle Unit #048H

2020 Spill Assessment and Closure  
November 2020

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## Limitations

This report has been prepared for the sole benefit of Devon Energy Production Company (Devon). This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division, without the express written consent of Vertex Resource Services Inc. (Vertex) and Devon. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

**ATTACHMENT 1**

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

Form C-141  
 Revised August 24, 2018  
 Submit to appropriate OCD District office

Incident ID	NRM1929549356
District RP	IRP-5763
Facility ID	
Application ID	pRM1929549418

## Release Notification

### Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # (assigned by OCD)
Contact mailing address	

### Location of Release Source

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 (NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# (if applicable)

Unit Letter	Section	Township	Range	County

Surface Owner:  State  Federal  Tribal  Private (Name: \_\_\_\_\_)

### Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

State of New Mexico  
Oil Conservation Division

Incident ID	NRM1929549356
District RP	1RP-5763
Facility ID	
Application ID	pRM1929549418

Was this a major release as defined by 19.15.29.7(A) NMAC?  <input type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release?
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If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

### Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

<input type="checkbox"/> The source of the release has been stopped. <input type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.
--

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_  
 Signature: Kendra DeHoyos Date: \_\_\_\_\_  
 email: \_\_\_\_\_ Telephone: \_\_\_\_\_

**OCD Only**  
 Received by: Ramona Marcus Date: 10/22/2019

Incident ID	NRM1929549356
District RP	1RP-5763
Facility ID	
Application ID	pRM1929549418

## Site Assessment/Characterization

*This information must be provided to the appropriate district office no later than 90 days after the release discovery date.*

What is the shallowest depth to groundwater beneath the area affected by the release?	< 50 (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

**Characterization Report Checklist:** *Each of the following items must be included in the report.*

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- Field data
- Data table of soil contaminant concentration data
- Depth to water determination
- Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- Boring or excavation logs
- Photographs including date and GIS information
- Topographic/Aerial maps
- Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico  
Oil Conservation Division

Page 4

Incident ID	NRM1929549356
District RP	1RP-5763
Facility ID	
Application ID	pRM1929549418

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Tom Bynum Title: EHS Consultant

Signature: *Tom Bynum* Date: 11/21/2020

email: tom.bynum@dn.com Telephone: 575-748-2663

**OCD Only**

Received by: Cristina Eads Date: 11/24/2020

Incident ID	NRM1929549356
District RP	1RP-5763
Facility ID	
Application ID	pRM1929549418

## Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist:** *Each of the following items must be included in the closure report.*

- A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Tom Bynum Title: EHS Consultant  
 Signature: *Tom Bynum* Date: 11/21/2020  
 email: tom.bynum@dvn.com Telephone: 575-748-2663

**OCD Only**

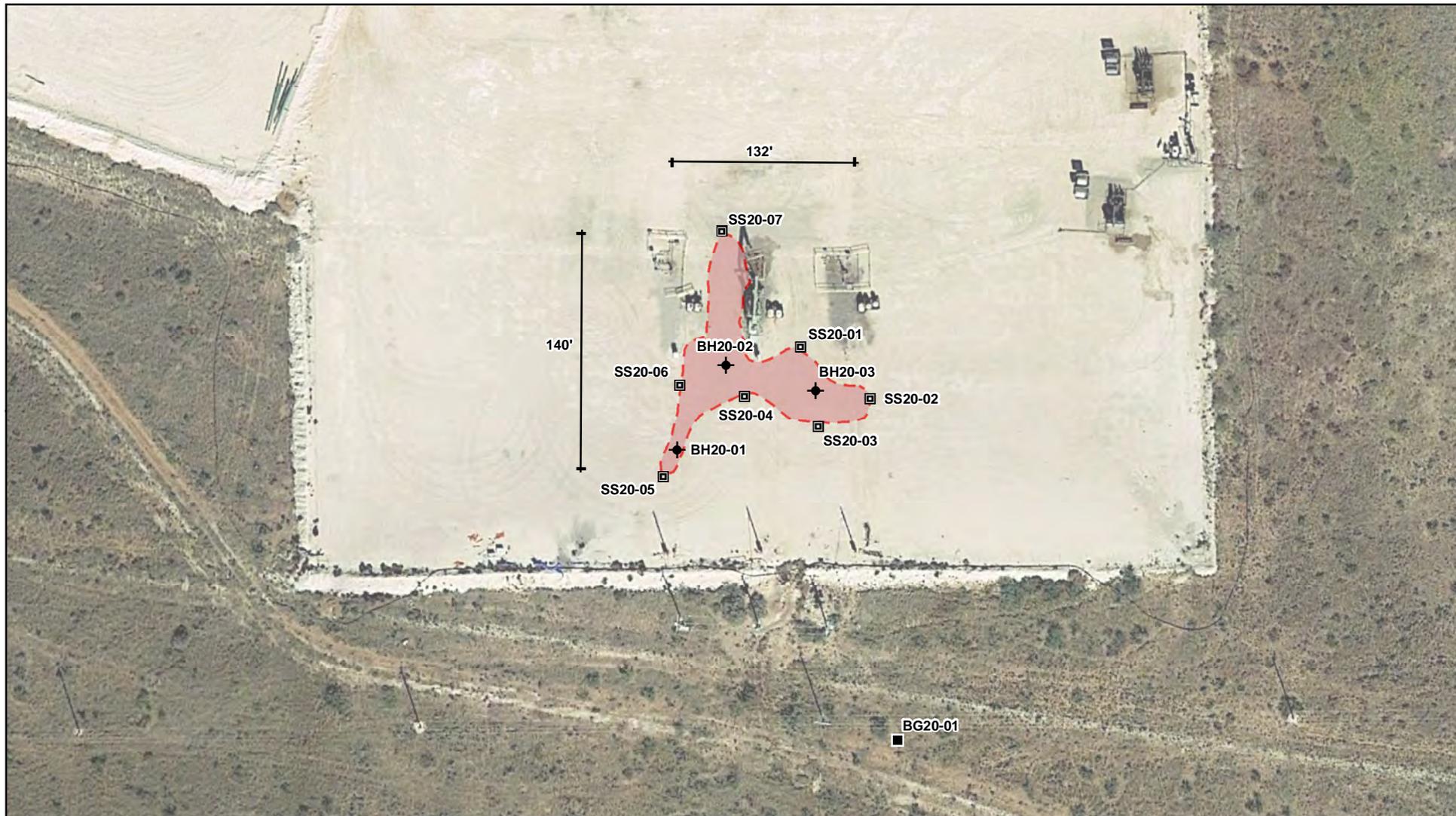
Received by: Cristina Eads Date: 11/24/2020

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

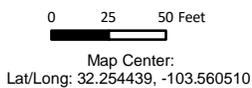
Closure Approved by: *Cristina Eads* Date: 02/03/2021  
 Printed Name: Cristina Eads Title: Environmental Specialist

## **ATTACHMENT 2**

Document Path: G:\1-Projects\US PROJECTS\Devon Energy Corporation\20E-00141019 - Thistle Unit #048H\Fig 1 Thistle Unit #048H Initial Characterization.mxd



- Background Sample
- ◆ Borehole
- Surface Sample
- ▭ Approximate Spill Extent (~ 4,881 sq. ft.)



NAD 1983 UTM Zone 13N  
Date: Jun 10/20



**Site Characterization and Sampling Locations**  
**Thistle Unit #048H**

FIGURE:

**1**

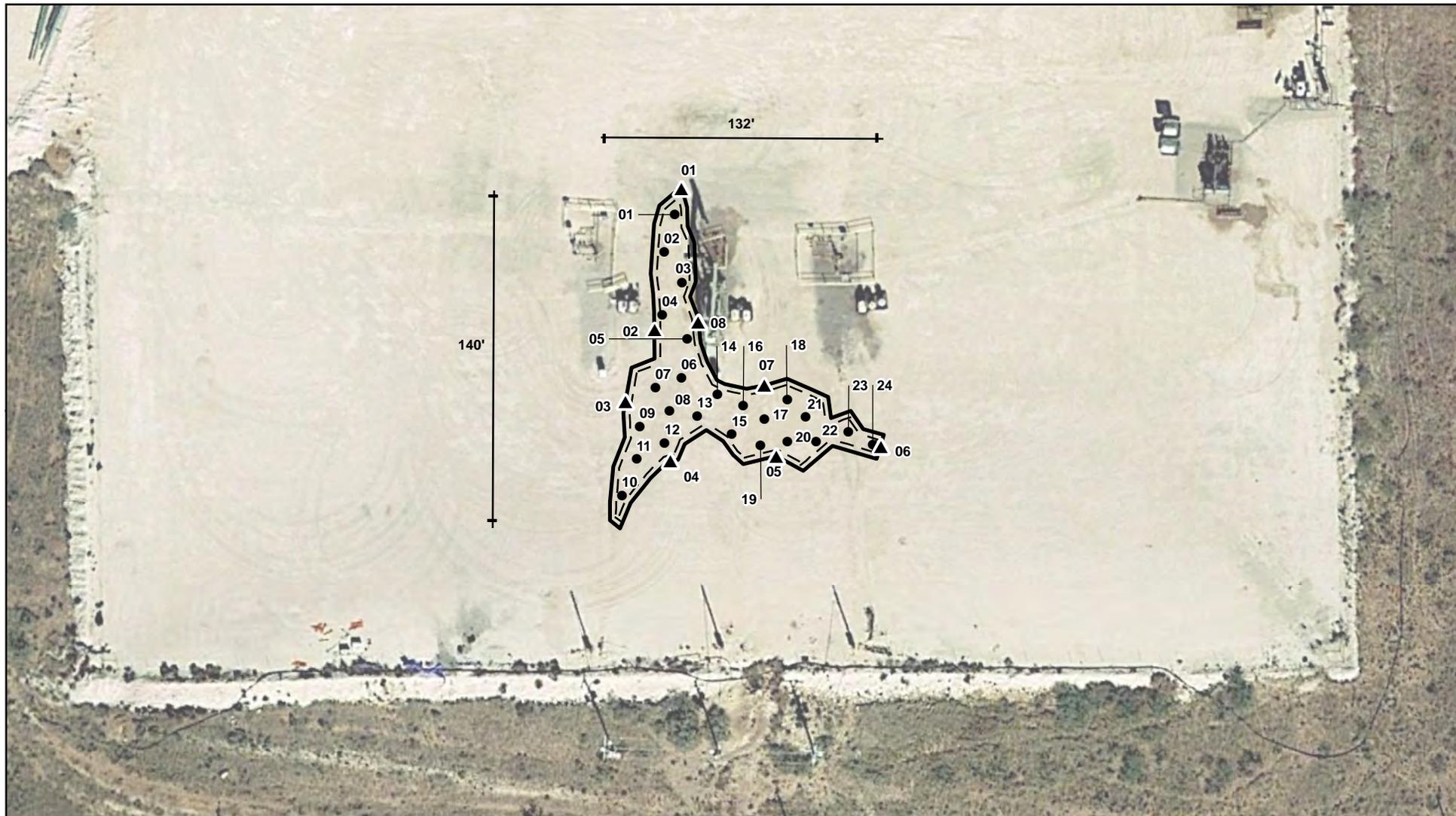


Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

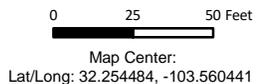
Note: Imagery from Google, 2017.

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Document Path: G:\Projects\US PROJECTS\Devon Energy Corporation\20E-00141019 - Thistle Unit #048H\Figure 2\_Thistle Unit #048H Confirmatory Schematic.mxd



- Base Sample (Prefixed by "BS20-")
- ▲ Wall Sample (Prefixed by "WS20-")
- ▭ Excavation ( 4,540 sq. ft. )



NAD 1983 UTM Zone 13N  
Date: Oct 23/20



**Confirmatory Schematic  
Thistle Unit #048H**

FIGURE:

2



Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Imagery from Google, 2017.

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## **ATTACHMENT 3**

<b>Closure Criteria Determination Worksheet</b>			
<b>Site Name: Thistle Unit 48</b>			
<b>Spill Coordinates:</b>		<b>X: 32.25470</b>	<b>Y: -103.56040</b>
<b>Site Specific Conditions</b>		<b>Value</b>	<b>Unit</b>
1	Depth to Groundwater	400	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	6,089	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	2,024	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	8,602	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, <b>or</b>	10,052	feet
	ii) Within 1000 feet of any fresh water well or spring		feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	5,351	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)		Critical High Medium Low
10	Within a 100-year Floodplain	undetermined	year
<b>NMAC 19.15.29.12 E (Table 1) Closure Criteria</b>		<50'	<50' 51-100' >100'

# Thistle Unit #048H

DTGW: 190 ft  
 Distance: 1.88 miles  
 USGS Well: 321611103321601  
 Latest Log: 2015  
 Elevation: 3641  
 Site Elevation: 3640

**Legend**

- Feature 1
- 📌 Thistle Unit #048H

321611103321601 321627103321601

32161910331

321609103321701

X-L Rd

Thistle Unit #048H

Co Rd 2-A

Google Earth



# Black Mamba 15 State Com 2H

Nearest USGS Well: 321611103321601  
Distance to well: 3.02 miles (15942 ft)  
Last measurement: 2015  
Elevation: 3641

## Legend

-  Black Mamba 15 St Com 2H CTB
-  Feature 1

 Black Mamba 15 St Com 2H CTB

321903

321805103352301

321746103352301

321611103321601 321627103321601

321619103315801

321609103321701

Delaware Basin Rd







## New Mexico Office of the State Engineer Point of Diversion Summary

		(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)				(NAD83 UTM in meters)	
<b>Well Tag</b>	<b>POD Number</b>	<b>Q64 Q16 Q4 Sec Tws Rng</b>	<b>X</b>	<b>Y</b>			
C 04014 POD5		1 4 2 01 24S 33E	639284	3569086			

<b>Driller License:</b>	1186	<b>Driller Company:</b>	ENVIRO-DRILL, INC.				
<b>Driller Name:</b>	HAMMER, RODNEY						
<b>Drill Start Date:</b>	02/13/2017	<b>Drill Finish Date:</b>	02/17/2017	<b>Plug Date:</b>			
<b>Log File Date:</b>	03/03/2017	<b>PCW Rev Date:</b>		<b>Source:</b>	Shallow		
<b>Pump Type:</b>		<b>Pipe Discharge Size:</b>		<b>Estimated Yield:</b>			
<b>Casing Size:</b>	2.00	<b>Depth Well:</b>	95 feet	<b>Depth Water:</b>	85 feet		

Water Bearing Stratifications:	Top	Bottom	Description
	70	95	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	80	95

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6/8/20 1:47 PM

POINT OF DIVERSION SUMMARY



# New Mexico Office of the State Engineer

## Active & Inactive Points of Diversion

(with Ownership Information)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	(quarters are smallest to largest)			(NAD83 UTM in meters)		Distance				
											q	q	q	X	Y					
<a href="#">C 02281</a>	CUB	COM	11.3	HUGHES PROPERTIES LLC	LE	<a href="#">C 02281</a>				Shallow	3	4	4	28	23S	33E	634495	3571183*		1953
<a href="#">C 02280</a>	CUB	COM	64.5	HUGHES PROPERTIES LLC	LE	<a href="#">C 02280</a>				Shallow	3	2	4	28	23S	33E	634489	3571586*		2298
<a href="#">C 02308</a>	CUB	STK	3	NGL WATER SOLUTIONS PERMIAN	LE	<a href="#">C 02308</a>					1	3	1	10	24S	33E	634953	3567364*		2307
<a href="#">C 02279</a>	CUB	COM	64.5	BRININSTOOL XL RANCH LLC	LE	<a href="#">C 02279</a>				Shallow	3	4	3	28	23S	33E	633691	3571173*		2493
<a href="#">C 02278</a>	CUB	COM	64.5	HUGHES PROPERTIES LLC	LE	<a href="#">C 02278</a>				Shallow	3	4	2	28	23S	33E	634484	3571989*		2660
<a href="#">LWD 01213</a>	CUB	PLS	3.7	DIAMOND & HALF INC	LE	<a href="#">LWD 01213 POD1</a>					4	3	1	01	24S	33E	638347	3568818*		2843
<a href="#">C 03591</a>	CUB	EXP	0	INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03591 POD1</a>				Artesian	2	1	4	05	24S	33E	632731	3568518		3064
<a href="#">C 02284</a>	CUB	STK	4.8	HUGHES PROPERTIES LLC	LE	<a href="#">C 02284</a>					4	2	4	26	23S	33E	637907	3571626*		3080
<a href="#">C 03565</a>	CUB	EXP	0	INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03565 POD4</a>					4	1	09	24S	33E	633672	3567057		3176	
					LE	<a href="#">C 03565 POD6</a>					3	3	10	24S	33E	635022	3566373		3256	
					LE	<a href="#">C 03565 POD5</a>					3	4	09	24S	33E	634135	3566496		3414	
<a href="#">C 02283</a>	CUB	STK	4.8	BRININSTOOL XL RANCH LLC	LE	<a href="#">C 02283</a>					4	2	2	26	23S	33E	637896	3572431*		3658
<a href="#">C 04014</a>	CUB	MON	0	GHD SERVICES, INC.	LE	<a href="#">C 04014 POD5</a>			NON	Shallow	1	4	2	01	24S	33E	639284	3569086		3709
					LE	<a href="#">C 04014 POD4</a>			NON	Shallow	3	4	2	01	24S	33E	639295	3568859		3757
<a href="#">C 02282</a>	CUB	STK	4.8	HUGHES PROPERTIES LLC	LE	<a href="#">C 02282</a>					3	1	1	25	23S	33E	638098	3572436*		3791
<a href="#">C 04014</a>	CUB	MON	0	GHD SERVICES, INC.	LE	<a href="#">C 04014 POD3</a>			NON	Shallow	2	4	2	01	24S	33E	639497	3569007		3931
<a href="#">C 03585</a>	CUB	EXP	0	INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03585 POD4</a>					4	4	1	15	24S	33E	635485	3565610		3968
<a href="#">C 03565</a>	CUB	EXP	0	INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03565 POD8</a>					4	1	15	24S	33E	635484	3565610		3968	

(R=POD has been replaced and no longer serves this file, (quarters are 1=NW 2=NE 3=SW 4=SE)  
 C=the file is closed) (quarters are smallest to largest) (NAD83 UTM in meters)

(acre ft per annum)

\*UTM location was derived from PLSS - see Help

(R=POD has been replaced and no longer serves this file, (quarters are 1=NW 2=NE 3=SW 4=SE)  
 C=the file is closed) (quarters are smallest to largest) (NAD83 UTM in meters)

(acre ft per annum)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q	q	q	Sec	Tws	Rng	X	Y	Distance	
<a href="#">C 03585</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03585 POD1</a>					3	4	1	15	24S	33E	635368	3565544		4039
<a href="#">C 04014</a>	CUB	MON		0 TRANSWESTERN PIPELINE CO LLC	LE	<a href="#">C 04014 POD2</a>		NON		Shallow	4	4	2	01	24S	33E	639655	3568917		4102
<a href="#">C 03565</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03565 POD3</a>					3	4	08	24S	33E		632763	3566546		4155
<a href="#">C 03585</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03585 POD2</a>					1	2	3	15	24S	33E	635418	3565363		4217
					LE	<a href="#">C 03585 POD5</a>					1	2	4	15	24S	33E	636245	3565387		4238
<a href="#">C 03565</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03565 POD7</a>					2	2	06	24S	33E		631361	3569250		4257
<a href="#">C 04014</a>	CUB	MON		0 TRANSWESTERN PIPELINE CO LLC	LE	<a href="#">C 04014 POD1</a>		NON		Shallow	1	1	3	06	24S	34E	639811	3568638		4307
<a href="#">C 03585</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03585 POD3</a>					1	2	3	15	24S	33E	635393	3565270		4311
<a href="#">C 02277</a>	CUB	COM	64.5	BRININSTOOL XL RANCH LLC	LE	<a href="#">C 02277</a>				Shallow	2	3	4	20	23S	33E	632663	3572970*		4491
<a href="#">C 03585</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03585 POD6</a>					2	4	4	15	24S	33E	636431	3565007		4643
<a href="#">C 03565</a>	CUB	EXP		0 INTERCONTINENTAL POTASH CORP	LE	<a href="#">C 03565 POD9</a>					4	4	15	24S	33E		636429	3565005		4645
					LE	<a href="#">C 03565 POD1</a>					1	4	06	24S	33E		630870	3568316		4901
<a href="#">C 03564</a>	C	STK		3 LIMESTONE BASIN PROPERTIES	LE	<a href="#">C 03564 POD1</a>					3	3	4	31	23S	34E	640513	3569695		4908

Record Count: 31

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 635606.86      **Northing (Y):** 3569577.14      **Radius:** 5000

**Sorted by:** Distance

\*UTM location was derived from PLSS - see Help

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USGS Water Resources

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 Geographic Area:

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# USGS 321348103340401 24S.33E.10.13123

Available data for this site

### Well Site

#### DESCRIPTION:

Latitude 32°14'04.9", Longitude 103°34'02.4" NAD83  
 Lea County, New Mexico , Hydrologic Unit 13070007  
 Well depth: 36 feet  
 Land surface altitude: 3,592 feet above NAVD88.  
 Well completed in "Ogallala Formation" (121OGLL) local aquifer

#### AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
<a href="#">Field groundwater-level measurements</a>	1953-11-27	2015-12-18	8
<a href="#">Revisions</a>	Unavailable (site:0) (timeseries:0)		

#### OPERATION:

Record for this site is maintained by the USGS New Mexico Water Science Center

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**Title: NWIS Site Information for USA: Site Inventory**

**URL: [https://waterdata.usgs.gov/nwis/inventory?agency\\_code=USGS&site\\_no=321348103340401](https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=321348103340401)**



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0.43 0.42 caww02



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## National Water Information System: Web Interface

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# USGS 321609103321701 23S.33E.26.421342

Available data for this site

### Well Site

#### DESCRIPTION:

Latitude 32°16'09", Longitude 103°32'17" NAD27  
 Lea County, New Mexico , Hydrologic Unit 13070007  
 Well depth: 173 feet  
 Land surface altitude: 3,648 feet above NAVD88.  
 Well completed in "Chinle Formation" (231CHNL) local aquifer

#### AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
<a href="#">Field groundwater-level measurements</a>	1972-09-21	1976-12-16	2
<a href="#">Revisions</a>	Unavailable (site:0) (timeseries:0)		

#### OPERATION:

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**Title: NWIS Site Information for USA: Site Inventory**

**URL: [https://waterdata.usgs.gov/nwis/inventory?agency\\_code=USGS&site\\_no=321609103321701](https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=321609103321701)**



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# USGS 321611103321601 23S.33E.26.42100

Available data for this site

### Well Site

#### DESCRIPTION:

Latitude 32°16'28.0", Longitude 103°32'15.6" NAD83  
 Lea County, New Mexico , Hydrologic Unit 13070007  
 Well depth: 190 feet  
 Land surface altitude: 3,641 feet above NAVD88.  
 Well completed in "Chinle Formation" (231CHNL) local aquifer

#### AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
<a href="#">Field groundwater-level measurements</a>	1972-09-21	2015-12-18	6
<a href="#">Revisions</a>	Unavailable (site:0) (timeseries:0)		

#### OPERATION:

Record for this site is maintained by the USGS New Mexico Water Science Center

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**Title: NWIS Site Information for USA: Site Inventory**

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0.5 0.44 caww01



# New Mexico Office of the State Engineer

## Water Column/Average Depth to Water

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
<a href="#">C 02281</a>	CUB	LE		3	4	4	28	23S	33E	634495	3571183*	1953	545	400	145
<a href="#">C 02280</a>	CUB	LE		3	2	4	28	23S	33E	634489	3571586*	2298	650	400	250
<a href="#">C 02308</a>	CUB	LE		1	3	1	10	24S	33E	634953	3567364*	2307	40	20	20
<a href="#">C 02279</a>	CUB	LE		3	4	3	28	23S	33E	633691	3571173*	2493	650	400	250
<a href="#">C 02278</a>	CUB	LE		3	4	2	28	23S	33E	634484	3571989*	2660	650	400	250
<a href="#">C 03591 POD1</a>	CUB	LE		2	1	4	05	24S	33E	632731	3568518	3064			
<a href="#">C 02284</a>	CUB	LE		4	2	4	26	23S	33E	637907	3571626*	3080	325	225	100
<a href="#">C 02283</a>	CUB	LE		4	2	2	26	23S	33E	637896	3572431*	3658	325	225	100
<a href="#">C 04014 POD5</a>	CUB	LE		1	4	2	01	24S	33E	639284	3569086	3709	95	85	10
<a href="#">C 04014 POD4</a>	CUB	LE		3	4	2	01	24S	33E	639295	3568859	3757	96	86	10
<a href="#">C 02282</a>	CUB	LE		3	1	1	25	23S	33E	638098	3572436*	3791	325	225	100
<a href="#">C 04014 POD3</a>	CUB	LE		2	4	2	01	24S	33E	639497	3569007	3931	95	87	8
<a href="#">C 04014 POD2</a>	CUB	LE		4	4	2	01	24S	33E	639656	3568917	4102	95	81	14
<a href="#">C 03565 POD3</a>	CUB	LE			3	4	08	24S	33E	632763	3566546	4155		1533	
<a href="#">C 04014 POD1</a>	CUB	LE		1	1	3	06	24S	34E	639811	3568638	4307	91	81	10
<a href="#">C 02277</a>	CUB	LE		2	3	4	20	23S	33E	632663	3572970*	4491	550	400	150

Average Depth to Water: **309 feet**  
 Minimum Depth: **20 feet**  
 Maximum Depth: **1533 feet**

Record Count: 16

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 635606.86

**Northing (Y):** 3569577.14

**Radius:** 5000

\*UTM location was derived from PLSS - see Help

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# New Mexico Office of the State Engineer

## Wells with Well Log Information

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

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

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

(NAD83 UTM in meters)

(in feet)

POD Number	POD Sub-Code	basin	County	Source	q	q	q	Sec	Tws	Rng	X	Y	Distance	Start Date	Finish Date	Log File Date	Depth Well	Depth Water	Driller	License Number
<a href="#">C 03591 POD1</a>	CUB	LE	Artesian	2	1	4	05	24S	33E	632731	3568518		3064	12/08/2012	01/10/2013	01/25/2013			PHILLIP STEWART	331
<a href="#">C 04014 POD5</a>	CUB	LE	Shallow	1	4	2	01	24S	33E	639284	3569086		3709	02/13/2017	02/17/2017	03/03/2017	95	85	HAMMER, RODNEY	1186
<a href="#">C 04014 POD4</a>	CUB	LE	Shallow	3	4	2	01	24S	33E	639295	3568859		3757	02/13/2017	02/17/2017	03/03/2017	96	86	HAMMER, RODNEY	1186
<a href="#">C 04014 POD3</a>	CUB	LE	Shallow	2	4	2	01	24S	33E	639497	3569007		3931	02/13/2017	02/17/2017	03/03/2017	95	87	HAMMER, RODNEY	1186
<a href="#">C 03565 POD8</a>	CUB	LE			4	1	15	24S	33E	635485	3565610		3968			04/02/2013				
<a href="#">C 04014 POD2</a>	CUB	LE	Shallow	4	4	2	01	24S	33E	639656	3568917		4102	02/13/2017	02/17/2017	03/03/2017	95	81	HAMMER, RODNEY	1186
<a href="#">C 03565 POD3</a>	CUB	LE			3	4	08	24S	33E	632763	3566546		4155	09/27/2012	10/21/2012	12/11/2012		1533	STEWART, PHILLIP D. (LD)	331
<a href="#">C 04014 POD1</a>	CUB	LE	Shallow	1	1	3	06	24S	34E	639811	3568638		4307	02/13/2017	02/17/2017	03/03/2017	91	81	HAMMER, RODNEY	1186
<a href="#">C 03565 POD9</a>	CUB	LE			4	4	15	24S	33E	636430	3565005		4645			04/02/2013				

Record Count: 9

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 635606.86

**Northing (Y):** 3569577.14

**Radius:** 5000

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# Thistle Unit 48: Pond 2,024 ft



February 6, 2020

### Wetlands

- |   |                                |   |                                   |   |          |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland       |  | Lake     |
|  | Estuarine and Marine Wetland   |  | Freshwater Forested/Shrub Wetland |  | Other    |
|   |                                |  | Freshwater Pond                   |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



# Thistle Unit 48: Watercourse 6,089 ft



February 6, 2020

### Wetlands

- |                                |                                   |          |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland       | Lake     |
| Estuarine and Marine Wetland   | Freshwater Forested/Shrub Wetland | Other    |
|                                | Freshwater Pond                   | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



# Thistle Unit 48: Wetland 5,351 ft



February 6, 2020

### Wetlands

- Estuarine and Marine Deepwater
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Estuarine and Marine Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

# National Flood Hazard Layer FIRMette



32°15'32.13"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- |                             |  |   |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS  |  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99  |
|                             |  | With BFE or Depth Zone AE, AO, AH, VE, AR   |
|                             |  | Regulatory Floodway   |
| OTHER AREAS OF FLOOD HAZARD |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
|                             |  | Future Conditions 1% Annual Chance Flood Hazard Zone X  |
|                             |  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X  |
|                             |  | Area with Flood Risk due to Levee Zone D  |
| OTHER AREAS                 |  | NO SCREEN Area of Minimal Flood Hazard Zone X   |
|                             |  | Effective LOMRs   |
| GENERAL STRUCTURES          |  | Area of Undetermined Flood Hazard Zone D  |
|                             |  | Channel, Culvert, or Storm Sewer  |
|                             |  | Levee, Dike, or Floodwall   |
| OTHER FEATURES              |  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation   |
|                             |  | 17.5 Coastal Transect   |
|                             |  | Base Flood Elevation Line (BFE)   |
|                             |  | Limit of Study  |
|                             |  | Jurisdiction Boundary   |
|                             |  | Coastal Transect Baseline   |
| MAP PANELS                  |  | Digital Data Available  |
|                             |  | No Digital Data Available   |
|                             |  | Unmapped  |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/6/2020 at 5:43:37 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map: Orthoimagery, Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

32°15'1.71"N

103°33'18.71"W

103°33'56.17"W

Document Path: G:\Projects\US PROJECTS\Devon Energy Corporation\20E-00141019 - Thistle Unit #048H\Figure X\Thistle Unit #048H Karst.mxd



**Karst Potential**

- Critical
- High
- Medium
- Low



Site



Site Buffer ( 1000 ft. )

**Overview Map**

0 0.25 0.5 1 mi

**Detail Map**

0 600 1,200 ft.



Map Center:  
Lat/Long: 32.254544, -103.560389

NAD 1983 UTM Zone 13N  
Date: Jun 08/20



**Karst Potential Map  
Thistle Unite #048H**

FIGURE:

**X**



Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

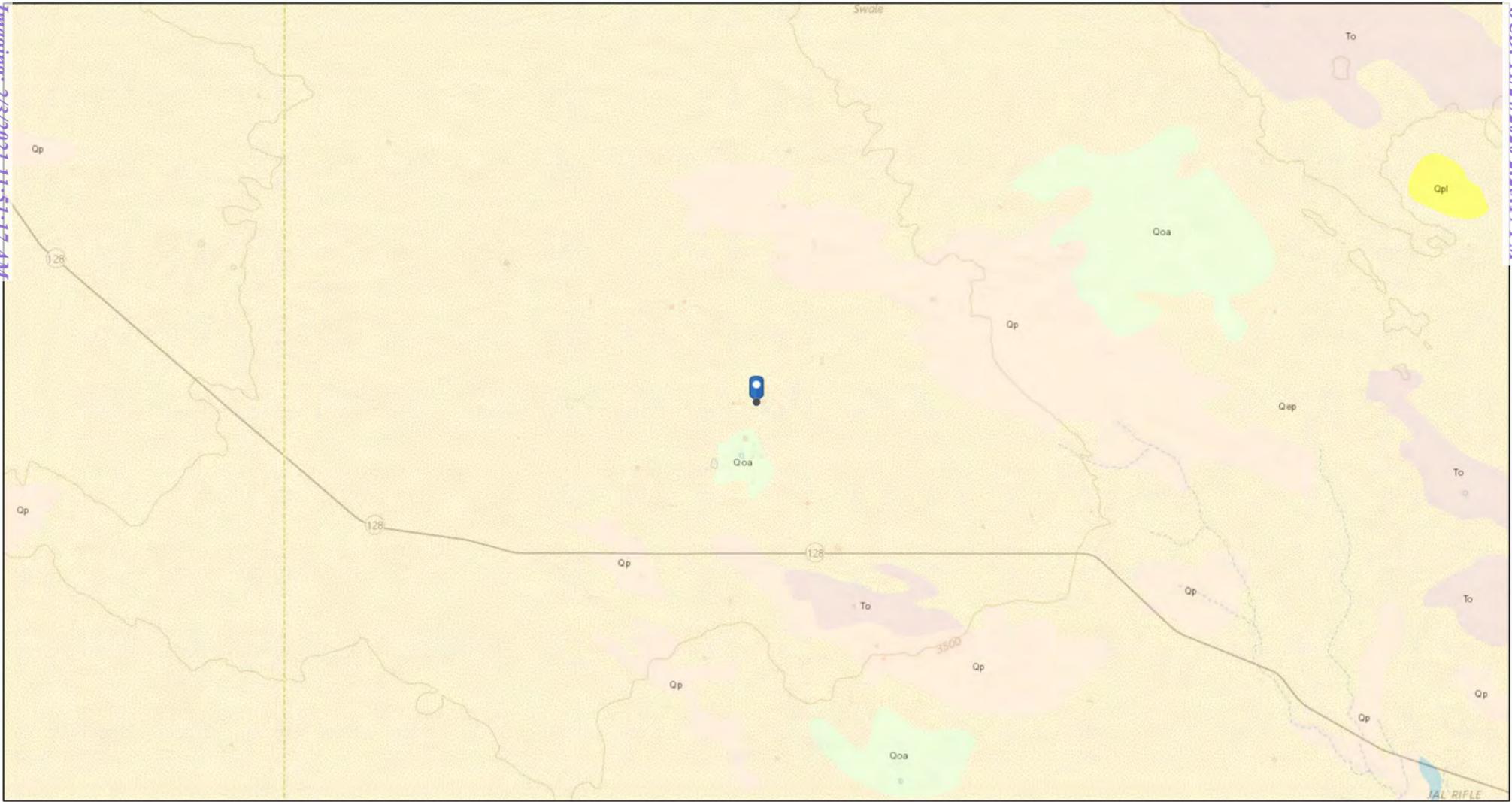
Note: Inset Map - ESRI 2018; Overview Map - ESRI World Topographic

**VERSATILITY. EXPERTISE.**

# Thistle Unit #048H Qep Geology

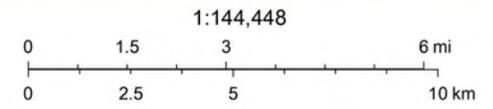
Released to Imaging: 2/3/2021 11:51:17 AM

Received by OCD: 11/24/2020 2:25:17 PM



6/8/2020, 1:38:58 PM

- |                           |                           |  |
|---------------------------|---------------------------|--|
| <b>Faults</b>             | <b>Dikes</b>              | <b>STATEMAP (1993 to Present) [Publications]</b> |
| — Fault, Exposed          | — <all other values>      | ■ Mapping in Complete                            |
| - - - Fault, Intermittent | — Dike                    | ■ Mapping in Progress                            |
| ..... Fault, Concealed    | ++++ Dike intruding fault |  |
| ~ Shere Zone              | * Volcanic Vents          |  |



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS

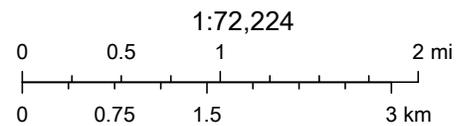
# Active Mines Near Thistle Unit 48



2/6/2020, 11:42:30 AM

Registered Mines

X Aggregate, Stone etc.



U.S. Bureau of Land Management - New Mexico State Office, Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS

EMNRD MMD GIS Coordinator

# Thistle Unit #048H

Nearest Town: Jal, NM  
Distance 23.53 miles

- Jal
- 📌 Thistle Unit #048H

Thistle Unit #048H 📌

18

128

Jal

205

3

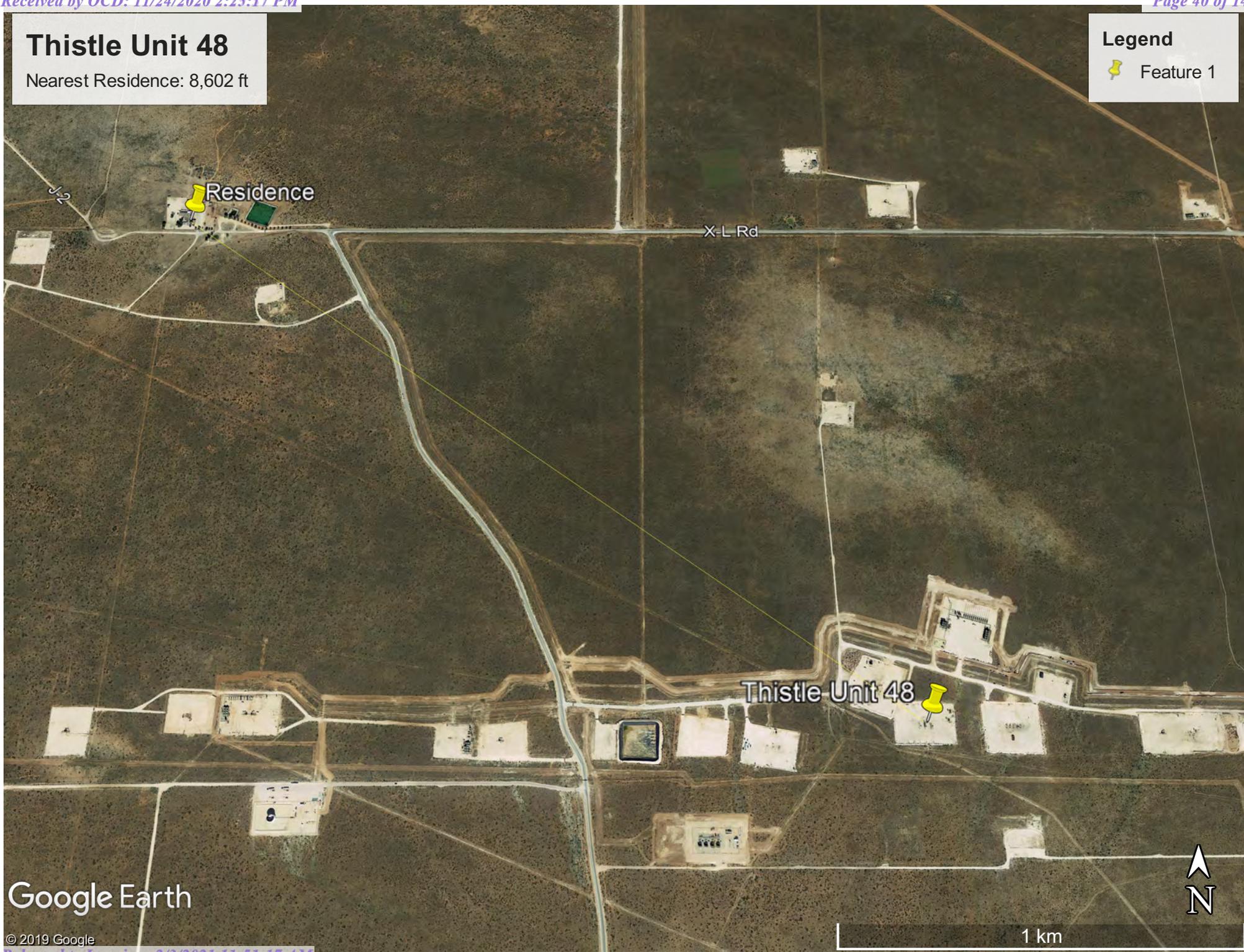


# Thistle Unit 48

Nearest Residence: 8,602 ft

## Legend

 Feature 1



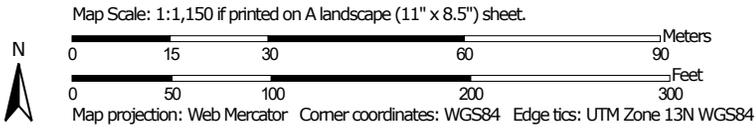
Google Earth

© 2019 Google

Soil Map—Lea County, New Mexico  
(Thistle Unit 48 Soil Map)



Soil Map may not be valid at this scale.



Soil Map—Lea County, New Mexico  
(Thistle Unit 48 Soil Map)

**MAP LEGEND**

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

**MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lea County, New Mexico  
Survey Area Data: Version 16, Sep 15, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BE	Berino-Cacique loamy fine sands association	5.7	100.0%
<b>Totals for Area of Interest</b>		<b>5.7</b>	<b>100.0%</b>

## Lea County, New Mexico

### BE—Berino-Cacique loamy fine sands association

#### Map Unit Setting

*National map unit symbol:* dmpd  
*Elevation:* 3,000 to 3,900 feet  
*Mean annual precipitation:* 10 to 13 inches  
*Mean annual air temperature:* 60 to 62 degrees F  
*Frost-free period:* 190 to 205 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Berino and similar soils:* 50 percent  
*Cacique and similar soils:* 40 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Berino

##### Setting

*Landform:* Plains  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Sandy eolian deposits derived from sedimentary rock over calcareous sandy alluvium derived from sedimentary rock

##### Typical profile

*A - 0 to 6 inches:* loamy fine sand  
*Btk - 6 to 60 inches:* sandy clay loam

##### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):*  
 Moderately high to high (0.60 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 40 percent  
*Gypsum, maximum in profile:* 1 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 2.0  
*Available water storage in profile:* Moderate (about 8.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7c

*Hydrologic Soil Group:* B

*Ecological site:* Loamy Sand (R042XC003NM)

*Hydric soil rating:* No

**Description of Cacique****Setting**

*Landform:* Plains

*Landform position (three-dimensional):* Rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Calcareous eolian deposits derived from sedimentary rock

**Typical profile**

*A - 0 to 12 inches:* loamy fine sand

*Bt - 12 to 28 inches:* sandy clay loam

*Bkm - 28 to 38 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* 20 to 40 inches to petrocalcic

*Natural drainage class:* Well drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 5 percent

*Gypsum, maximum in profile:* 1 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 2.0

*Available water storage in profile:* Low (about 3.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7c

*Hydrologic Soil Group:* C

*Ecological site:* Sandy (R042XC004NM)

*Hydric soil rating:* No

**Minor Components****Maljamar**

*Percent of map unit:* 6 percent

*Ecological site:* Limy Upland 16-21" PZ (R077CY028TX)

*Hydric soil rating:* No

**Palomas**

*Percent of map unit:* 4 percent

*Ecological site:* Loamy Sand (R042XC003NM)

*Hydric soil rating:* No

**Data Source Information**

Soil Survey Area: Lea County, New Mexico

Survey Area Data: Version 16, Sep 15, 2019

## **ATTACHMENT 4**



# Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	11/12/2020
Site Location Name:	Thistle Unit #048H	Report Run Date:	11/13/2020 12:58 AM
Client Contact Name:	Amanda Davis	API #:	30-025-41253
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Thistle Unit #048H	Project Owner:	Amanda Davis
Project Reference #	09/08/2019 PW Release	Project Manager:	Natalie Gordon

## Summary of Times

Arrived at Site	11/12/2020 7:45 AM
Departed Site	11/12/2020 4:00 PM

## Field Notes

- 8:48** Arrived on site and completed all related safety paperwork.  
Conducted Tailgate with 2 representatives from Pecos River before beginning backfill.
- 8:50** All T-post and safety fence removed to accommodate backfill material into excavation
- 15:46** Completed backfill

## Next Steps & Recommendations

- 1 Close job



# Daily Site Visit Report

## Site Photos

Viewing Direction: North



Excavation before backfill

Viewing Direction: North



Backfill completed

Viewing Direction: South



Backfill completed

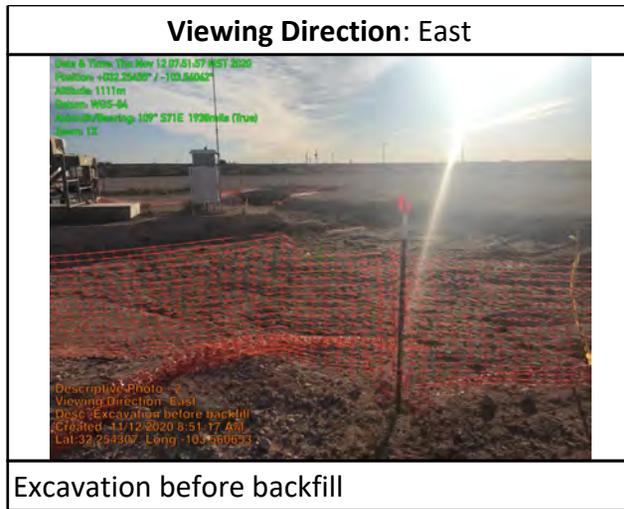
Viewing Direction: West



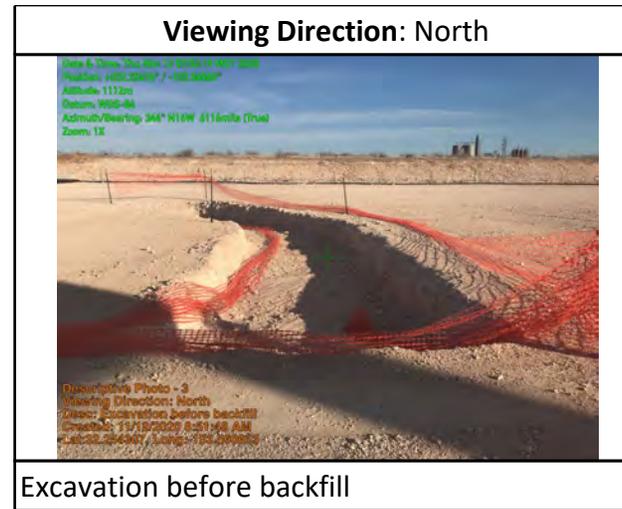
Backfill completed



# Daily Site Visit Report



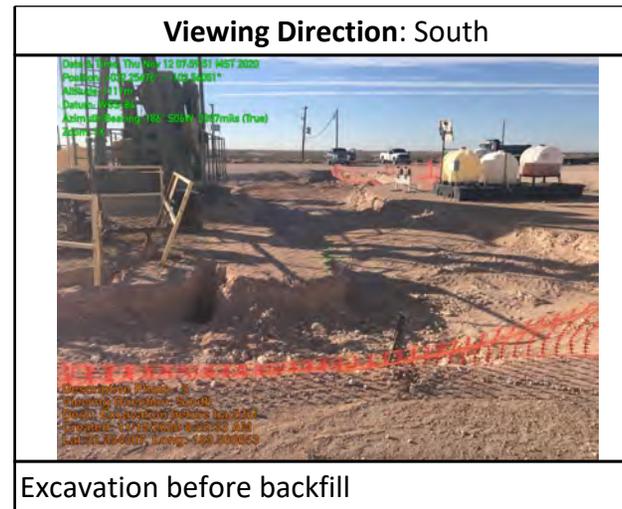
Excavation before backfill



Excavation before backfill



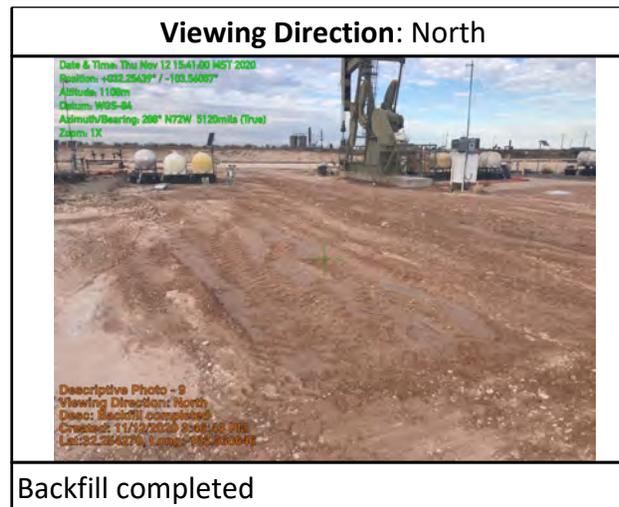
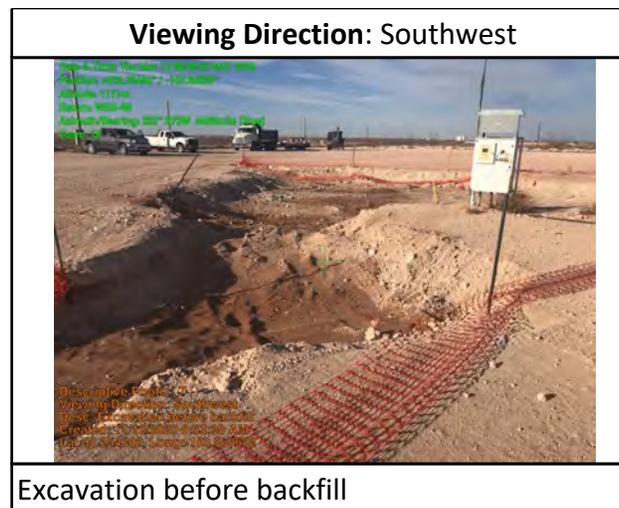
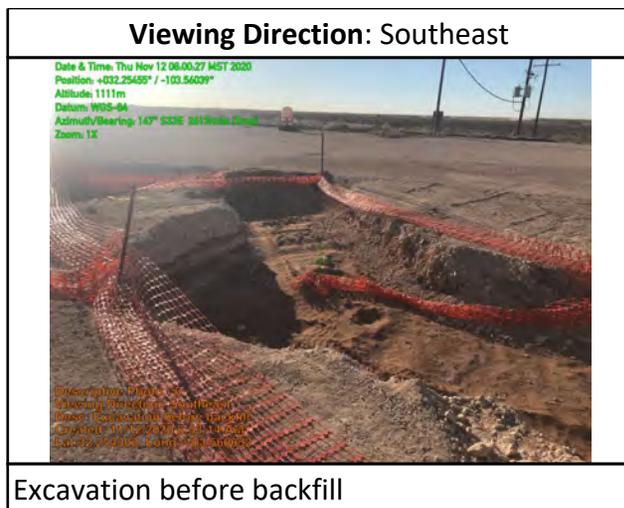
Excavation before backfill



Excavation before backfill



# Daily Site Visit Report



# Daily Site Visit Report



Daily Site Visit Signature

**Inspector:** Austin Harris

**Signature:**

A handwritten signature in black ink, appearing to be 'A. Harris', written over a horizontal line.

Signature

Spill Response and Sampling

Client: Devon  
 Date: 10/23/2020  
 Site Name: Thistle Unit 048  
 Site Location: 100  
 Project Owner: \_\_\_\_\_  
 Project Manager: \_\_\_\_\_  
 Project #: \_\_\_\_\_

Initial Spill Information - Record on First Visit  
 Spill Date: \_\_\_\_\_  
 Spill Volume: \_\_\_\_\_  
 Spill Cause: \_\_\_\_\_  
 Spill Product: \_\_\_\_\_  
 Recovered Spill Volume: \_\_\_\_\_  
 Recovery Method: \_\_\_\_\_

		Field Screening			Data Collection (Check for Yes)			
Sample ID	Depth (ft)	VOC (PID)	PetroFlag TPH (ppm)	Quantab (High/Low) + or -	Lab Analysis	Picture	Trimble Coordinates	Marked on Site Sketch
SS/TP/BH - Year - Number Ex. BH18-01	Ex. 2ft	Ex. 400 ppm	200 ppm	EC Ex. High +	Ex. Hydrocarbon Chloride			
BS20-01	1'	0	10	0.21/19°	No odor			
-02	1'	0		0.23/18.2°				
-03	1'	0	7	0.24/16°				
-04	1'	0		0.30/17°				
-05	1'	0		0.19/17.3°				
-06	1'	0	5	0.22/18.1°				
-07	1'	0		0.26/18.3°				
-08	2'	0		0.24/17.1°				
-09	2'	0	12	0.29/18.2°				
-10	2'	0		0.33/17.2°				
11	2'	0		0.33/17°				
12	2'	0	10	0.21/17.3°				
13	2'	0		0.28/17.9°				
14	2'	0		0.24/16.1				
15	2'	0	7	0.27/17.2				
16	2'	0		0.21/18.9°				
17	2'	0		0.23/18°				
18	2'	0		0.25/19°				
19	2'	0		0.17/18.5°				
20	2'	0		0.19/17.2°				
21	2'	0		0.23/15.6				
22	2'	0		0.29/17.2°				



# Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/22/2020
Site Location Name:	Thistle Unit #048H	Report Run Date:	11/6/2020 4:09 PM
Client Contact Name:	Amanda Davis	API #:	30-025-41253
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Thistle Unit #048H	Project Owner:	Amanda Davis
Project Reference #	09/08/2019 PW Release	Project Manager:	Natalie Gordon

## Summary of Times

Arrived at Site	10/22/2020 9:04 AM
Departed Site	10/22/2020 3:57 PM

## Field Notes

- 8:39** Continue excavation to 1-2' bgs. Continue field screening to ensure footprint and sidewall are below NMOCD <50' DTGW criteria.
- 8:40** Prepare confirmatory sample plan when excavation is completed so samples are placed every 200 square feet.

## Next Steps & Recommendations

- 1 Collect confirmation samples for lab submission.
- 2 Await sample results for site closure and backfill.



# Daily Site Visit Report

## Site Photos

Viewing Direction: West



Site-Data Photo - 1  
Viewing Direction: West  
Desc: Remediation in progress  
Created: 11/6/2020 8:41:26 AM  
Lat:33.419483, Long:-104.580636

Remediation in progress

Viewing Direction: South



Site-Data Photo - 2  
Viewing Direction: South  
Desc: Remediation in progress  
Created: 11/6/2020 8:42:18 AM  
Lat:33.419483, Long:-104.580636

Remediation in progress

Viewing Direction: East



Site-Data Photo - 3  
Viewing Direction: East  
Desc: Excavation  
Created: 11/6/2020 8:43:00 AM  
Lat:33.419483, Long:-104.580636

Excavation

Viewing Direction: North



Site-Data Photo - 4  
Viewing Direction: North  
Desc: Excavation  
Created: 11/6/2020 8:43:24 AM  
Lat:33.419483, Long:-104.580636

Excavation



# Daily Site Visit Report

**Viewing Direction: South**



Description Photo:  
Viewing Direction: South  
Date: 11/24/2020  
Created: 11/24/2020 2:41:22 AM  
Latitude: 31.19497, Longitude: 104.33627

**Excavation**

**Viewing Direction: West**



Description Photo:  
Viewing Direction: West  
Date: 11/24/2020  
Created: 11/24/2020 2:42:04 AM  
Latitude: 31.19476, Longitude: 104.33627

**Excavation**

**Viewing Direction: West**



Description Photo:  
Viewing Direction: West  
Date: 11/24/2020  
Created: 11/24/2020 2:42:11 AM  
Latitude: 31.19497, Longitude: 104.33627

**Excavation**

# Daily Site Visit Report



Daily Site Visit Signature

**Inspector:** Kevin Smith

**Signature:**

  
Signature



# Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/20/2020
Site Location Name:	Thistle Unit #048H	Report Run Date:	10/27/2020 5:52 PM
Client Contact Name:	Amanda Davis	API #:	30-025-41253
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Thistle Unit #048H	Project Owner:	Amanda Davis
Project Reference #	09/08/2019 PW Release	Project Manager:	Natalie Gordon

### Summary of Times

Arrived at Site	10/20/2020 8:35 AM
Departed Site	10/20/2020 3:54 PM

### Field Notes

**14:07** Remediation will begin at site. Cleanup will be to below 50 feet DTGW criteria. Excavation will be field screened as digging takes place.

### Next Steps & Recommendations

- 1 Continue excavation tomorrow.



# Daily Site Visit Report

## Site Photos

Viewing Direction: South



Descriptive Photo - 1  
Viewing Direction: South  
Date: 10/21/2020 2:55:40 PM  
Caption: 10/21/2020 2:55:40 PM  
Lat: 32.254589, Long: 103.500586

Excavation in progress

Viewing Direction: Southwest



Descriptive Photo - 2  
Viewing Direction: Southwest  
Date: 10/21/2020 2:55:41 PM  
Caption: 10/21/2020 2:55:41 PM  
Lat: 32.254590, Long: 103.500586

Excavation in progress

Viewing Direction: North



Descriptive Photo - 3  
Viewing Direction: North  
Date: 10/21/2020 2:55:41 PM  
Caption: 10/21/2020 2:55:41 PM  
Lat: 32.254589, Long: 103.500586

Excavation in progress

Viewing Direction: North



Descriptive Photo - 4  
Viewing Direction: North  
Date: 10/21/2020 2:55:41 PM  
Caption: 10/21/2020 2:55:41 PM  
Lat: 32.254589, Long: 103.500586

Impacted area prior to remediation

# Daily Site Visit Report



Daily Site Visit Signature

**Inspector:** Kevin Smith

**Signature:**

  
Signature



# Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	3/18/2020
Site Location Name:	Thistle Unit #048H	Report Run Date:	3/19/2020 1:53 AM
Project Owner:	Amanda Davis	File (Project) #:	20E-00141
Project Manager:	Natalie Gordon	API #:	30-025-41253
Client Contact Name:	Amanda Davis	Reference	09/08/2019 PW Release
Client Contact Phone #:	(575) 748-0176		

## Summary of Times

Left Office	3/18/2020 7:45 AM
Arrived at Site	3/18/2020 8:49 AM
Departed Site	3/18/2020 5:06 PM
Returned to Office	3/18/2020 6:15 PM

## Summary of Daily Operations

- 8:49** Arrive on site.  
 Complete safety paperwork.  
 Conduct initial site visit and obtain characterization soil samples.  
 Document and complete DFR.  
 Return to office.
- 19:47** Spill area in middle of Pad around middle pump jack.  
 Spill extends southeast approximately 50'.  
 Spill extends southwest approach 75'.  
 Locates would be preferred on entirety of pad.

## Next Steps & Recommendations

- 1 Schedule remediation



# Daily Site Visit Report

## Sampling

### Background20-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.		88 ppm	Low (30-600 ppm)	0.1 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25391828, - 103.56022253	Yes
1 ft.		18 ppm	Low (30-600 ppm)	0.1 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25391828, - 103.56022253	Yes
2 ft.		14 ppm	Low (30-600 ppm)	0.1 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25391828, - 103.56022253	Yes

### BH20-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0.5 ft.			Low (30-600 ppm)	493 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25438034, - 103.56062472	Yes
1 ft.			Low (30-600 ppm)	103 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25438034, - 103.56062472	Yes

### BH20-02

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0.5 ft.			High (300- 6000ppm)	8936 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW- 4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25451501, - 103.56053743	Yes



# Daily Site Visit Report

1 ft.			High (300-6000ppm)	6338 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25451501, -103.56053743	Yes
1.5 ft.			High (300-6000ppm)	2831 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25451501, -103.56053743	Yes
2 ft.			High (300-6000ppm)	998 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25451501, -103.56053743	Yes

**BH20-03**

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0.5 ft.			High (300-6000ppm)	2629 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25447359, -103.56036405	Yes
1 ft.			High (300-6000ppm)	1185 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25447359, -103.56036405	Yes

**SS20-01**

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.		77 ppm	Low (30-600 ppm)	132 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25454395, -103.56038861	Yes



## Daily Site Visit Report

SS20-02									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.			Low (30-600 ppm)	406 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25446859, -103.56029139	Yes	
SS20-03									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.			Low (30-600 ppm)	0.1 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25441962, -103.56036220	Yes	
SS20-04									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.			Low (30-600 ppm)	117 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25446381, -103.56050166	Yes	
SS20-05									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.		110 ppm	Low (30-600 ppm)	60 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25434674, -103.56065188	Yes	



# Daily Site Visit Report

SS20-06									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.			Low (30-600 ppm)	0.1 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25448565, -103.56062381	Yes	
SS20-07									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.			High (300-6000ppm)	750 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (SW-4500 Cl), TPH (EPA SW-846 Method 8015M)		32.25472752, -103.56053548	Yes	



# Daily Site Visit Report

## Site Photos

Viewing Direction: East



Descriptive Photo  
Viewing Direction: East  
Spec: Spill area southeast of pump jack  
Created: 3/19/2020 10:18:08 AM  
Lat:32.254444, Long:-103.252222

Spill area southeast of pump jack

Viewing Direction: Southeast



Descriptive Photo  
Viewing Direction: Southeast  
Spec: Spill area southeast of pump jack  
Created: 3/19/2020 10:20:56 AM  
Lat:32.254444, Long:-103.252222

Spill area southeast of pump jack

Viewing Direction: Southwest



Descriptive Photo  
Viewing Direction: Southwest  
Spec: Spill area southeast of pump jack  
Created: 3/19/2020 10:21:14 AM  
Lat:32.254444, Long:-103.252222

Spill area southeast of pump jack

Viewing Direction: Northwest



Descriptive Photo  
Viewing Direction: Northwest  
Spec: Spill area southeast of pump jack  
Created: 3/19/2020 10:21:08 AM  
Lat:32.254444, Long:-103.252222

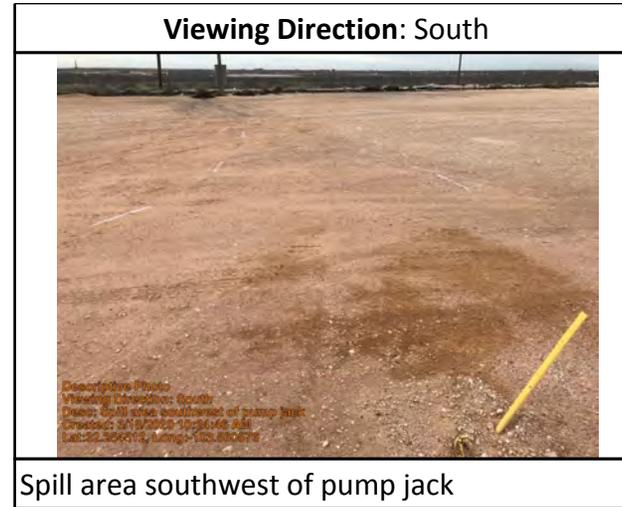
Spill area southeast of pump jack



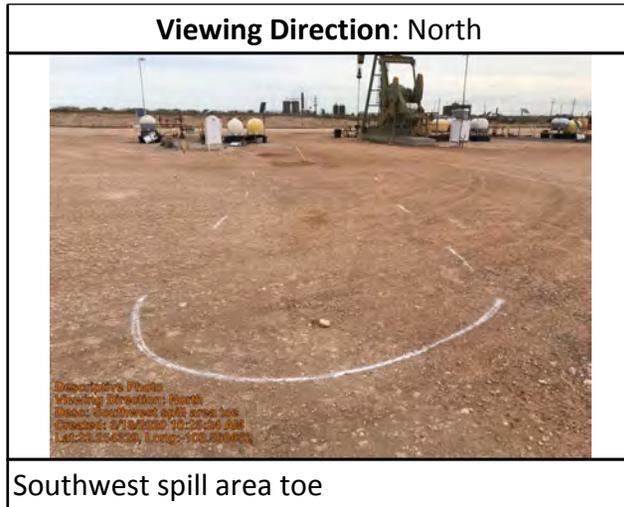
# Daily Site Visit Report



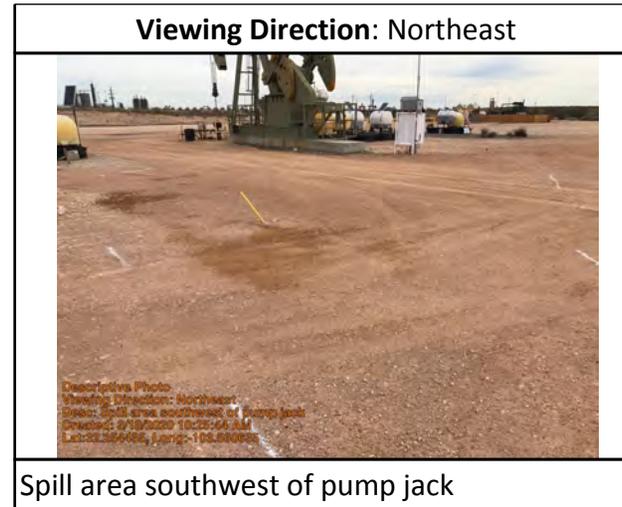
Spill area southwest of pump jack



Spill area southwest of pump jack



Southwest spill area toe



Spill area southwest of pump jack



# Daily Site Visit Report

Viewing Direction: North



Descriptive Photo  
Viewing Direction: North  
Desc: Spill area west of pump jack between western most well head  
Created: 3/18/2020 10:26:27 AM  
Lat:32.284665, Long:-103.590608

Spill area west of pump jack between western most well head

Viewing Direction: South



Descriptive Photo  
Viewing Direction: South  
Desc: Spill area west of pump jack between western most well head  
Created: 3/18/2020 10:27:33 AM  
Lat:32.284779, Long:-103.590473

Spill area west of pump jack between western most well head

Viewing Direction: North



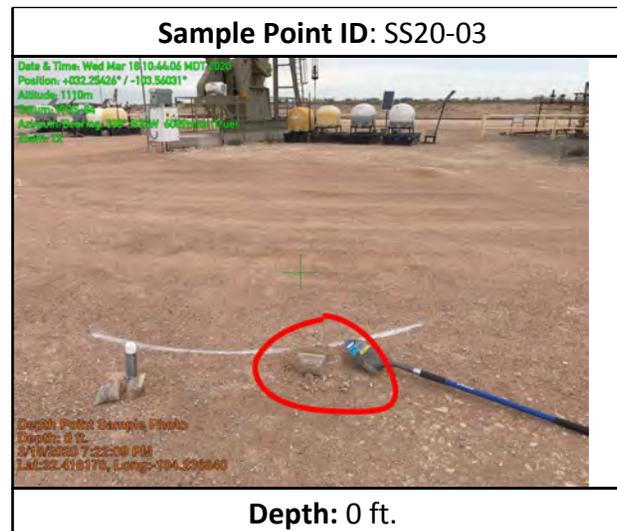
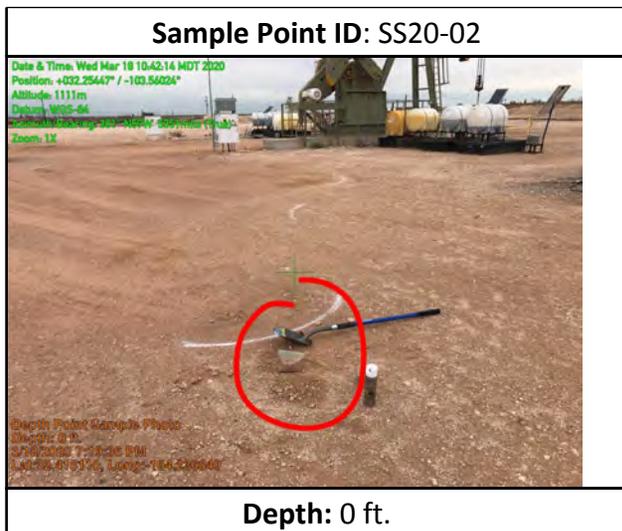
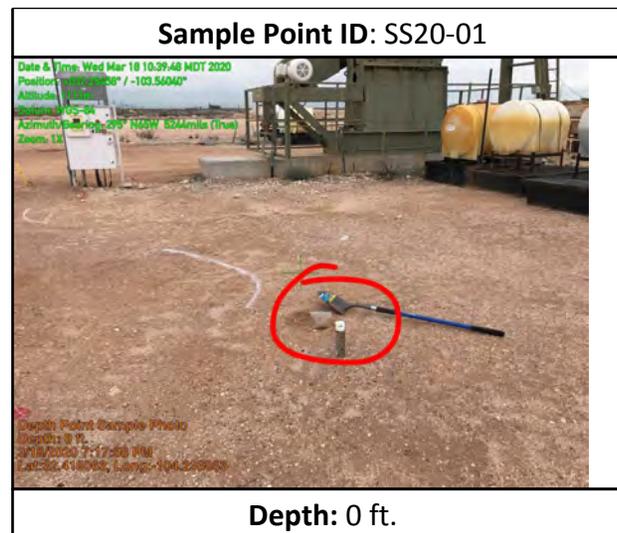
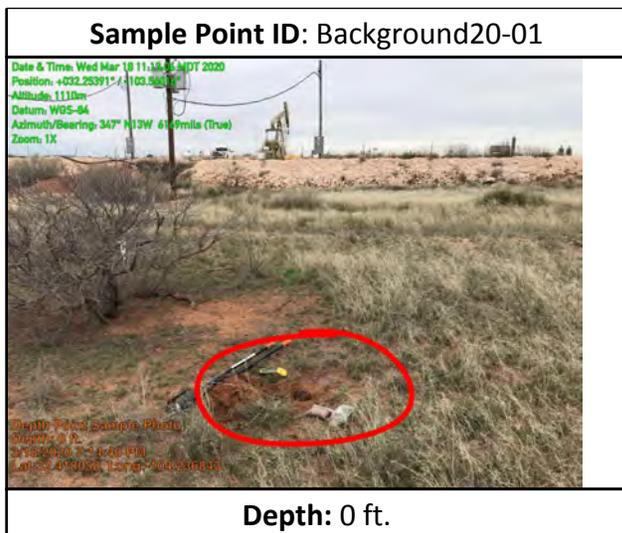
Descriptive Photo  
Viewing Direction: North  
Desc: Field screen form  
Created: 3/18/2020 6:46:17 PM  
Lat:32.254447, Long:-103.591096

Field screen form



# Daily Site Visit Report

## Depth Sample Photos





# Daily Site Visit Report

**Sample Point ID: SS20-04**

Date & Time: Wed Mar 18 10:46:39 MDT 2020  
 Position: +032.25445° / -103.56052°  
 Altitude: 1111m  
 Datum: WGS-84  
 Azimuth/Bearing: 013° N103° 00' 00" W  
 Zone: 12

Depth Point Sample Photo  
 Depth: 0 ft.  
 3/18/2020 7:04:07 PM  
 Lat: 32.4718184, Long: -104.238288

**Depth: 0 ft.**

**Sample Point ID: SS20-05**

Date & Time: Wed Mar 18 10:49:03 MDT 2020  
 Position: +032.25427° / -103.56066°  
 Altitude: 1111m  
 Datum: WGS-84  
 Azimuth/Bearing: 047° N072° 00' 00" W  
 Zone: 12

Depth Point Sample Photo  
 Depth: 0 ft.  
 3/18/2020 7:20:48 PM  
 Lat: 32.4718184, Long: -104.238288

**Depth: 0 ft.**

**Sample Point ID: SS20-06**

Date & Time: Wed Mar 18 10:50:11 MDT 2020  
 Position: +032.25449° / -103.56052°  
 Altitude: 1113m  
 Datum: WGS-84  
 Azimuth/Bearing: 003° N40E 100mils  
 Zone: 12

Depth Point Sample Photo  
 Depth: 0 ft.  
 3/18/2020 7:28:14 PM  
 Lat: 32.4718184, Long: -104.238288

**Depth: 0 ft.**

**Sample Point ID: SS20-07**

Date & Time: Wed Mar 18 10:55:58 MDT 2020  
 Position: +032.25469° / -103.56055°  
 Altitude: 1114m  
 Datum: WGS-84  
 Azimuth/Bearing: 03° S27E 720mils  
 Zone: 12

Depth Point Sample Photo  
 Depth: 0 ft.  
 3/18/2020 7:38:08 PM  
 Lat: 32.4718184, Long: -104.238288

**Depth: 0 ft.**



# Daily Site Visit Report

**Sample Point ID: BH20-01**

Date & Time: Wed Mar 18 14:11:55 MDT 2020  
Position: +032.25444° / -103.56066°  
Altitude: 1103m  
Datum: WGS-84  
Azimuth/Bearing: 318° N42W 565mils (True)  
Zoom: 1X

Depth Point Sample Photo  
Depth: 0.5 ft.  
3/19/2020 7:29:05 PM  
Lat:32.418104, Long:-104.238888

**Depth: 0.5 ft.**

**Sample Point ID: BH20-02**

Date & Time: Wed Mar 18 14:32:50 MDT 2020  
Position: +032.25444° / -103.56066°  
Altitude: 1116m  
Datum: WGS-84  
Azimuth/Bearing: 318° N42W 565mils (True)  
Zoom: 1X

Depth Point Sample Photo  
Depth: 0.5 ft.  
3/19/2020 7:32:51 PM  
Lat:32.418208, Long:-104.238872

**Depth: 0.5 ft.**

**Sample Point ID: BH20-03**

Date & Time: Wed Mar 18 17:01:28 MDT 2020  
Position: +032.25444° / -103.56027°  
Altitude: 1111m  
Datum: WGS-84  
Azimuth/Bearing: 318° N42W 565mils (True)  
Zoom: 1X

Depth Point Sample Photo  
Depth: 0.5 ft.  
3/19/2020 7:58:04 PM  
Lat:32.418526, Long:-104.238488

**Depth: 0.5 ft.**

# Daily Site Visit Report



Daily Site Visit Signature

**Inspector:** Austin Harris

**Signature:**

A handwritten signature in black ink, appearing to be 'AH' with a large loop, written over a horizontal line.

Signature

## **ATTACHMENT 5**

Client Name: Devon Energy Production Company  
 Site Name: Thistle Unit #048H  
 NM OCD Incident Tracking Numbers: NRM1929549356  
 Project #: 20E-00141-019  
 Lab Report: 2003932, 2006525

Table 2. Characterization Sampling Field Screening and Laboratory Data Results - Depth to Groundwater < 50 ft													
Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID) (ppm)	Extractable Organic Compounds (Petro Flag) (ppm)	Inorganics (Electroconductivity) (ppm)	Volatile		Extractable					Chloride (mg/kg)
						Benzene (mg/kg)	BTEX (Total) (mg/kg)	Gasoline Range Organics (GRO) (mg/kg)	Diesel Range Organics (DRO) (mg/kg)	Motor Oil Range Organics (MRO) (mg/kg)	(GRO + DRO) (mg/kg)	Total Petroleum Hydrocarbons (TPH) (mg/kg)	
BG20-01	0	March 18, 2020		88	0	-	-	-	-	-	-	-	-
BG20-01	1	March 18, 2020		18	0	-	-	-	-	-	-	-	-
BG20-01	2	March 18, 2020		14	0	-	-	-	-	-	-	-	-
BH20-01	0.5	March 18, 2020			493	-	-	-	-	-	-	-	-
BH20-01	1	March 18, 2020			103	-	-	-	-	-	-	-	-
BH20-02	0.5	March 18, 2020			8,936	<0.024	<0.219	<4.9	130	65	130	<b>195</b>	<b>7,800</b>
BH20-02	1	March 18, 2020			6,338	-	-	-	-	-	-	-	-
BH20-02	1.5	March 18, 2020			2,831	-	-	-	-	-	-	-	-
BH20-02	2	March 18, 2020			998	<0.025	<0.221	<4.9	24	<46	24	24	<b>1,100</b>
BH20-03	0.5	March 18, 2020			2,629	-	-	-	-	-	-	-	-
BH20-03	1	March 18, 2020			1,185	-	-	-	-	-	-	-	-
SS20-01	0	March 18, 2020		77	132	<0.024	<0.216	<4.8	<9.6	<48	<14.4	<62.4	130
SS20-02	0	March 18, 2020			406	<0.024	<0.216	<4.8	100	160	100	<b>260</b>	350
SS20-02	0.5	June 9, 2020				<0.025	<0.224	<5.0	<10.0	<50	<15.0	<65.0	180
SS20-03	0	March 18, 2020			0	-	-	-	-	-	-	-	-
SS20-04	0	March 18, 2020			117	<0.024	<0.217	<4.8	200	290	200	<b>490</b>	210
SS 20-04	0.5	June 9, 2020				<0.023	<0.210	<4.7	<9.4	<47	<14.1	<61.1	270
SS20-05	0	March 18, 2020		110	60	<0.025	<0.221	<4.9	<9.1	<46	<14	<60	160
SS20-06	0	March 18, 2020			0	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	<60
SS20-07	0	March 18, 2020		77	750	-	-	-	-	-	-	-	-

"-" indicates not applicable/assessed

**Bold and shaded indicates exceedance outside of applied action level**



Client Name: Devon Energy Production Company  
 Site Name: Thistle Unit 048  
 NM OCD Tracking Number: NRM1929549356  
 Vertex Project #: 20E-00141-019  
 Lab Reports: 2010B65

Table 3. Confirmatory Sampling Laboratory Results - Depth to Groundwater < 50 feet

Sample Description			Petroleum Hydrocarbons							Inorganic
Sample ID	Depth (ft)	Sample Date	Volatile		Extractable					Chloride
			Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MIRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BS20-01	1'	October 23, 2020	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	270
BS20-02	1'	October 23, 2020	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	200
BS20-03	1'	October 23, 2020	<0.024	<0.219	<4.9	<9.3	<47	<14.2	<61.2	260
BS20-04	1'	October 23, 2020	<0.025	<0.222	<4.9	<8.9	<44	<13.8	<57.8	200
BS20-05	1'	October 23, 2020	<0.024	<0.22	<4.9	<8.9	<44	<13.8	<57.8	91
BS20-06	1'	October 23, 2020	<0.025	<0.224	<5.0	<8.6	<43	<13.6	<56.6	89
BS20-07	2'	October 23, 2020	<0.025	<0.27	<4.9	<8.9	<44	<13.8	<57.8	76
BS20-08	2'	October 23, 2020	<0.025	<0.224	<5.0	<9.4	<47	<14.4	<61.4	77
BS20-09	2'	October 23, 2020	<0.025	<0.225	<5.0	<8.8	<44	<13.8	<57.8	150
BS20-10	2'	October 23, 2020	<0.025	<0.224	<5.0	<9.5	<47	<14.5	<61.5	150
BS20-11	2'	October 23, 2020	<0.024	<0.219	<4.9	<9.9	<50	<14.8	<64.8	100
BS20-12	2'	October 23, 2020	<0.025	<0.221	<4.9	<9.7	<48	<14.6	<62.6	150
BS20-13	2'	October 23, 2020	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	93
BS20-14	2'	October 23, 2020	<0.025	<0.221	<4.9	<8.9	<44	<13.8	<57.8	67
BS20-15	2'	October 23, 2020	<0.024	<0.22	<4.9	<10	<50	<14.9	<64.9	75
BS20-16	2'	October 23, 2020	<0.025	<0.225	<5.0	<9.2	<46	<14.2	<60.2	97
BS20-17	2'	October 23, 2020	<0.025	<0.224	<5.0	<8.9	<45	<13.9	<58.9	130
BS20-18	2'	October 23, 2020	<0.025	<0.221	<4.9	<9.2	<46	<14.1	<60.1	94
BS20-19	2'	October 23, 2020	<0.025	<0.221	<4.9	<8.5	<42	<13.4	<55.4	74
BS20-20	2'	October 23, 2020	<0.025	<0.224	<5.0	<8.6	<43	<13.6	<56.6	90
BS20-21	2'	October 23, 2020	<0.025	<0.225	<5.0	<8.7	<43	<13.7	<56.7	150
BS20-22	2'	October 23, 2020	<0.025	<0.224	<5.0	<8.6	<43	<13.6	<56.6	110
BS20-23	2'	October 23, 2020	<0.025	<0.222	<4.9	<9.3	<46	<14.2	<60.2	84
BS20-24	2'	October 23, 2020	<0.025	<0.221	<4.9	<8.0	<40	<12.9	<52.9	100
WS20-01	0-1'	October 23, 2020	<0.024	<0.22	<4.9	<8.5	<43	<13.4	<56.4	93
WS20-02	0-1'	October 23, 2020	<0.025	<0.225	<5.0	<8.9	<44	<13.9	<57.9	250
WS20-03	0-1'	October 23, 2020	<0.025	<0.222	<4.9	<9.3	<47	<14.2	<61.2	250
WS20-04	0-2'	October 23, 2020	<0.025	<0.225	<5.0	<9.0	<45	<14.0	<59.0	240
WS20-05	0-2'	October 23, 2020	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	240
WS20-06	0-2'	October 23, 2020	<0.024	<0.219	<4.9	<9.5	<47	<14.4	<61.4	260
WS20-07	0-2'	October 23, 2020	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	230
WS20-08	0-2'	October 23, 2020	<0.025	<0.225	<5.1	<9.1	<46	<14.2	<60.2	250

Bold and gray shaded indicates exceedance outside of closure criteria



## **ATTACHMENT 6**

## Natalie Gordon

---

**From:** Dhugal Hanton <vertexresourcegroupusa@gmail.com>  
**Sent:** Friday, November 20, 2020 2:31 PM  
**To:** Natalie Gordon  
**Subject:** Fwd: NRM1929549356: Thistle Unit 48H - 48-hr Notification of Confirmatory Sampling

----- Forwarded message -----

From: **Dhugal Hanton** <[vertexresourcegroupusa@gmail.com](mailto:vertexresourcegroupusa@gmail.com)>  
Date: Tue, Oct 20, 2020 at 5:52 PM  
Subject: NRM1929549356: Thistle Unit 48H - 48-hr Notification of Confirmatory Sampling  
To: Enviro, OCD, EMNRD <[OCD.Enviro@state.nm.us](mailto:OCD.Enviro@state.nm.us)>, <[tom.bynum@dvn.com](mailto:tom.bynum@dvn.com)>, <[amanda.davis@dvn.com](mailto:amanda.davis@dvn.com)>, <[wesley.mathews@dvn.com](mailto:wesley.mathews@dvn.com)>, <[Lupe.Carrasco@dvn.com](mailto:Lupe.Carrasco@dvn.com)>, <[spills@slo.state.nm.us](mailto:spills@slo.state.nm.us)>, <[rmann@slo.state.nm.us](mailto:rmann@slo.state.nm.us)>

All,

Please accept this email as 48-hr notification that Vertex Resource Services Inc. has scheduled confirmatory sampling to be conducted at Thistle Unit 48H for the release that occurred on September 8, 2019.

This work will be conducted on behalf of Devon Energy Production Company.

On Friday, October 23, 2020 at approximately 9 a.m., Kevin Smith of Vertex will be onsite to conduct confirmatory sampling. He can be reached at 575-988-0871. If you need directions to the site, please do not hesitate to contact him. If you have any questions or concerns regarding this notification, please give me a call at 505-506-0040.

Thank you,  
Natalie

**Natalie Gordon**  
Project Manager

Vertex Resource Group Ltd.  
213 S. Mesa Street  
Carlsbad, NM 88220

**P 575.725.5001 ext 709**  
**C 505.506.0040**  
**F**

[www.vertex.ca](http://www.vertex.ca)

Confidentiality Notice: This message and any attachments are solely for the intended recipient and may contain confidential or privileged information. If you are not the intended recipient, any disclosure, copying, use, or distribution of the information included in this message and any attachment is prohibited. If you have received this communication in error, please notify us by reply email and immediately and permanently delete this message and any attachments. Thank you.

## **ATTACHMENT 7**



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

March 26, 2020

Natalie Gordon  
Vertex Resource Group Ltd.  
213 S. Mesa St  
Carlsbad, NM 88220  
TEL:  
FAX

RE: Thistle Unit 048H

OrderNo.: 2003932

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 7 sample(s) on 3/20/2020 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2003932

Date Reported: 3/26/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-01 0.0'

Project: Thistle Unit 048H

Collection Date: 3/18/2020 10:30:00 AM

Lab ID: 2003932-001

Matrix: SOIL

Received Date: 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	130	61		mg/Kg	20	3/23/2020 7:46:44 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/22/2020 8:13:50 AM	51242
Surr: BFB	102	70-130		%Rec	1	3/22/2020 8:13:50 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/23/2020 9:32:49 PM	51243
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/23/2020 9:32:49 PM	51243
Surr: DNOP	95.7	55.1-146		%Rec	1	3/23/2020 9:32:49 PM	51243
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.024		mg/Kg	1	3/22/2020 8:13:50 AM	51242
Toluene	ND	0.048		mg/Kg	1	3/22/2020 8:13:50 AM	51242
Ethylbenzene	ND	0.048		mg/Kg	1	3/22/2020 8:13:50 AM	51242
Xylenes, Total	ND	0.096		mg/Kg	1	3/22/2020 8:13:50 AM	51242
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	3/22/2020 8:13:50 AM	51242
Surr: 4-Bromofluorobenzene	85.2	70-130		%Rec	1	3/22/2020 8:13:50 AM	51242
Surr: Dibromofluoromethane	105	70-130		%Rec	1	3/22/2020 8:13:50 AM	51242
Surr: Toluene-d8	96.7	70-130		%Rec	1	3/22/2020 8:13:50 AM	51242

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

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

Page 1 of 12

**Analytical Report**

Lab Order **2003932**

Date Reported: **3/26/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Vertex Resource Group Ltd.

**Client Sample ID:** SS20-02 0.0'

**Project:** Thistle Unit 048H

**Collection Date:** 3/18/2020 10:40:00 AM

**Lab ID:** 2003932-002

**Matrix:** SOIL

**Received Date:** 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	350	60		mg/Kg	20	3/23/2020 8:23:49 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/22/2020 8:43:11 AM	51242
Surr: BFB	96.7	70-130		%Rec	1	3/22/2020 8:43:11 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	100	9.1		mg/Kg	1	3/23/2020 9:57:09 PM	51243
Motor Oil Range Organics (MRO)	160	45		mg/Kg	1	3/23/2020 9:57:09 PM	51243
Surr: DNOP	106	55.1-146		%Rec	1	3/23/2020 9:57:09 PM	51243
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.024		mg/Kg	1	3/22/2020 8:43:11 AM	51242
Toluene	ND	0.048		mg/Kg	1	3/22/2020 8:43:11 AM	51242
Ethylbenzene	ND	0.048		mg/Kg	1	3/22/2020 8:43:11 AM	51242
Xylenes, Total	ND	0.096		mg/Kg	1	3/22/2020 8:43:11 AM	51242
Surr: 1,2-Dichloroethane-d4	99.2	70-130		%Rec	1	3/22/2020 8:43:11 AM	51242
Surr: 4-Bromofluorobenzene	85.8	70-130		%Rec	1	3/22/2020 8:43:11 AM	51242
Surr: Dibromofluoromethane	98.8	70-130		%Rec	1	3/22/2020 8:43:11 AM	51242
Surr: Toluene-d8	92.8	70-130		%Rec	1	3/22/2020 8:43:11 AM	51242

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

**Analytical Report**

Lab Order **2003932**

Date Reported: **3/26/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Vertex Resource Group Ltd.

**Client Sample ID:** SS20-04 0.0'

**Project:** Thistle Unit 048H

**Collection Date:** 3/18/2020 10:50:00 AM

**Lab ID:** 2003932-003

**Matrix:** SOIL

**Received Date:** 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	210	60		mg/Kg	20	3/23/2020 9:25:34 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/22/2020 9:12:30 AM	51242
Surr: BFB	100	70-130		%Rec	1	3/22/2020 9:12:30 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	200	46		mg/Kg	5	3/24/2020 8:54:36 AM	51243
Motor Oil Range Organics (MRO)	290	230		mg/Kg	5	3/24/2020 8:54:36 AM	51243
Surr: DNOP	90.1	55.1-146		%Rec	5	3/24/2020 8:54:36 AM	51243
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.024		mg/Kg	1	3/22/2020 9:12:30 AM	51242
Toluene	ND	0.048		mg/Kg	1	3/22/2020 9:12:30 AM	51242
Ethylbenzene	ND	0.048		mg/Kg	1	3/22/2020 9:12:30 AM	51242
Xylenes, Total	ND	0.097		mg/Kg	1	3/22/2020 9:12:30 AM	51242
Surr: 1,2-Dichloroethane-d4	98.7	70-130		%Rec	1	3/22/2020 9:12:30 AM	51242
Surr: 4-Bromofluorobenzene	87.0	70-130		%Rec	1	3/22/2020 9:12:30 AM	51242
Surr: Dibromofluoromethane	99.2	70-130		%Rec	1	3/22/2020 9:12:30 AM	51242
Surr: Toluene-d8	97.4	70-130		%Rec	1	3/22/2020 9:12:30 AM	51242

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

## Analytical Report

Lab Order 2003932

Date Reported: 3/26/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-05 0.0'

Project: Thistle Unit 048H

Collection Date: 3/18/2020 11:00:00 AM

Lab ID: 2003932-004

Matrix: SOIL

Received Date: 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	160	60		mg/Kg	20	3/23/2020 9:37:55 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/22/2020 9:41:48 AM	51242
Surr: BFB	102	70-130		%Rec	1	3/22/2020 9:41:48 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	3/23/2020 10:45:33 PM	51243
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	3/23/2020 10:45:33 PM	51243
Surr: DNOP	96.3	55.1-146		%Rec	1	3/23/2020 10:45:33 PM	51243
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.025		mg/Kg	1	3/22/2020 9:41:48 AM	51242
Toluene	ND	0.049		mg/Kg	1	3/22/2020 9:41:48 AM	51242
Ethylbenzene	ND	0.049		mg/Kg	1	3/22/2020 9:41:48 AM	51242
Xylenes, Total	ND	0.098		mg/Kg	1	3/22/2020 9:41:48 AM	51242
Surr: 1,2-Dichloroethane-d4	99.5	70-130		%Rec	1	3/22/2020 9:41:48 AM	51242
Surr: 4-Bromofluorobenzene	86.9	70-130		%Rec	1	3/22/2020 9:41:48 AM	51242
Surr: Dibromofluoromethane	102	70-130		%Rec	1	3/22/2020 9:41:48 AM	51242
Surr: Toluene-d8	93.4	70-130		%Rec	1	3/22/2020 9:41:48 AM	51242

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

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

## Analytical Report

Lab Order 2003932

Date Reported: 3/26/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-06 0.0'

Project: Thistle Unit 048H

Collection Date: 3/18/2020 11:10:00 AM

Lab ID: 2003932-005

Matrix: SOIL

Received Date: 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	ND	60		mg/Kg	20	3/23/2020 9:50:16 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/22/2020 10:11:15 AM	51242
Surr: BFB	106	70-130		%Rec	1	3/22/2020 10:11:15 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	3/24/2020 12:08:35 PM	51257
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	3/24/2020 12:08:35 PM	51257
Surr: DNOP	94.8	55.1-146		%Rec	1	3/24/2020 12:08:35 PM	51257
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.025		mg/Kg	1	3/22/2020 10:11:15 AM	51242
Toluene	ND	0.049		mg/Kg	1	3/22/2020 10:11:15 AM	51242
Ethylbenzene	ND	0.049		mg/Kg	1	3/22/2020 10:11:15 AM	51242
Xylenes, Total	ND	0.099		mg/Kg	1	3/22/2020 10:11:15 AM	51242
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	3/22/2020 10:11:15 AM	51242
Surr: 4-Bromofluorobenzene	88.8	70-130		%Rec	1	3/22/2020 10:11:15 AM	51242
Surr: Dibromofluoromethane	106	70-130		%Rec	1	3/22/2020 10:11:15 AM	51242
Surr: Toluene-d8	96.9	70-130		%Rec	1	3/22/2020 10:11:15 AM	51242

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

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

## Analytical Report

Lab Order 2003932

Date Reported: 3/26/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-02 0.5'

Project: Thistle Unit 048H

Collection Date: 3/18/2020 1:00:00 PM

Lab ID: 2003932-006

Matrix: SOIL

Received Date: 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	7800	300		mg/Kg	100	3/24/2020 2:31:44 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/22/2020 10:40:42 AM	51242
Surr: BFB	103	70-130		%Rec	1	3/22/2020 10:40:42 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	130	9.8		mg/Kg	1	3/24/2020 11:23:17 AM	51257
Motor Oil Range Organics (MRO)	65	49		mg/Kg	1	3/24/2020 11:23:17 AM	51257
Surr: DNOP	95.0	55.1-146		%Rec	1	3/24/2020 11:23:17 AM	51257
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.024		mg/Kg	1	3/22/2020 10:40:42 AM	51242
Toluene	ND	0.049		mg/Kg	1	3/22/2020 10:40:42 AM	51242
Ethylbenzene	ND	0.049		mg/Kg	1	3/22/2020 10:40:42 AM	51242
Xylenes, Total	ND	0.097		mg/Kg	1	3/22/2020 10:40:42 AM	51242
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	3/22/2020 10:40:42 AM	51242
Surr: 4-Bromofluorobenzene	80.8	70-130		%Rec	1	3/22/2020 10:40:42 AM	51242
Surr: Dibromofluoromethane	104	70-130		%Rec	1	3/22/2020 10:40:42 AM	51242
Surr: Toluene-d8	94.7	70-130		%Rec	1	3/22/2020 10:40:42 AM	51242

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

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

Page 6 of 12

**Analytical Report**

Lab Order **2003932**

Date Reported: **3/26/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Vertex Resource Group Ltd.

**Client Sample ID:** BH20-02 2.0'

**Project:** Thistle Unit 048H

**Collection Date:** 3/18/2020 1:30:00 PM

**Lab ID:** 2003932-007

**Matrix:** SOIL

**Received Date:** 3/20/2020 8:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	1100	60		mg/Kg	20	3/23/2020 10:14:59 PM	51270
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>DJF</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/22/2020 11:10:08 AM	51242
Surr: BFB	103	70-130		%Rec	1	3/22/2020 11:10:08 AM	51242
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	24	9.3		mg/Kg	1	3/24/2020 11:45:18 AM	51257
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	3/24/2020 11:45:18 AM	51257
Surr: DNOP	94.7	55.1-146		%Rec	1	3/24/2020 11:45:18 AM	51257
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>DJF</b>
Benzene	ND	0.025		mg/Kg	1	3/22/2020 11:10:08 AM	51242
Toluene	ND	0.049		mg/Kg	1	3/22/2020 11:10:08 AM	51242
Ethylbenzene	ND	0.049		mg/Kg	1	3/22/2020 11:10:08 AM	51242
Xylenes, Total	ND	0.098		mg/Kg	1	3/22/2020 11:10:08 AM	51242
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	3/22/2020 11:10:08 AM	51242
Surr: 4-Bromofluorobenzene	87.1	70-130		%Rec	1	3/22/2020 11:10:08 AM	51242
Surr: Dibromofluoromethane	107	70-130		%Rec	1	3/22/2020 11:10:08 AM	51242
Surr: Toluene-d8	95.3	70-130		%Rec	1	3/22/2020 11:10:08 AM	51242

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2003932

26-Mar-20

**Client:** Vertex Resource Group Ltd.

**Project:** Thistle Unit 048H

Sample ID: <b>MB-51270</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>51270</b>	RunNo: <b>67496</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/23/2020</b>	SeqNo: <b>2330729</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-51270</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>51270</b>	RunNo: <b>67496</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/23/2020</b>	SeqNo: <b>2330730</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.0	90	110			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2003932

26-Mar-20

**Client:** Vertex Resource Group Ltd.

**Project:** Thistle Unit 048H

Sample ID: <b>MB-51243</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>51243</b>	RunNo: <b>67488</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/23/2020</b>	SeqNo: <b>2329303</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.0		10.00		89.5	55.1	146			

Sample ID: <b>LCS-51243</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>51243</b>	RunNo: <b>67488</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/23/2020</b>	SeqNo: <b>2329304</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.7	70	130			
Surr: DNOP	4.5		5.000		89.5	55.1	146			

Sample ID: <b>MB-51257</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>51257</b>	RunNo: <b>67512</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/24/2020</b>	SeqNo: <b>2330911</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.0		10.00		90.4	55.1	146			

Sample ID: <b>LCS-51257</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>51257</b>	RunNo: <b>67512</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/24/2020</b>	SeqNo: <b>2331072</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	90.9	70	130			
Surr: DNOP	4.4		5.000		88.8	55.1	146			

Sample ID: <b>2003932-005AMS</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>SS20-06 0.0'</b>	Batch ID: <b>51257</b>	RunNo: <b>67512</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/24/2020</b>	SeqNo: <b>2331073</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	9.6	47.94	3.644	71.8	47.4	136			
Surr: DNOP	4.4		4.794		91.3	55.1	146			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2003932

26-Mar-20

**Client:** Vertex Resource Group Ltd.

**Project:** Thistle Unit 048H

Sample ID: <b>2003932-005AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>SS20-06 0.0'</b>	Batch ID: <b>51257</b>	RunNo: <b>67512</b>								
Prep Date: <b>3/23/2020</b>	Analysis Date: <b>3/24/2020</b>	SeqNo: <b>2331811</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	9.8	49.12	3.644	69.4	47.4	136	0.952	43.4	
Surr: DNOP	4.2		4.912		85.9	55.1	146	0	0	

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2003932

26-Mar-20

**Client:** Vertex Resource Group Ltd.

**Project:** Thistle Unit 048H

Sample ID: <b>mb-51242</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>PBS</b>	Batch ID: <b>51242</b>	RunNo: <b>67487</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/22/2020</b>	SeqNo: <b>2329072</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		103	70	130			
Surr: 4-Bromofluorobenzene	0.44		0.5000		88.2	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.49		0.5000		97.6	70	130			

Sample ID: <b>ics-51242</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>51242</b>	RunNo: <b>67487</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/22/2020</b>	SeqNo: <b>2329073</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	91.9	70	130			
Toluene	0.90	0.050	1.000	0	90.4	70	130			
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		105	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.5000		89.1	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		103	70	130			
Surr: Toluene-d8	0.47		0.5000		94.7	70	130			

**Qualifiers:**

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

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2003932

26-Mar-20

**Client:** Vertex Resource Group Ltd.

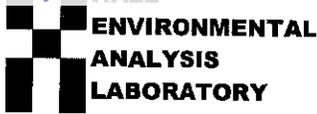
**Project:** Thistle Unit 048H

Sample ID: <b>mb-51242</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>51242</b>	RunNo: <b>67487</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/22/2020</b>	SeqNo: <b>2329193</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	540		500.0		108	70	130			

Sample ID: <b>ics-51242</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>51242</b>	RunNo: <b>67487</b>								
Prep Date: <b>3/20/2020</b>	Analysis Date: <b>3/22/2020</b>	SeqNo: <b>2329194</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	86.2	70	130			
Surr: BFB	530		500.0		107	70	130			

**Qualifiers:**

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



# Sample Log-In Check List

Client Name: **VERTEX CARLSBAD**      Work Order Number: **2003932**      RcptNo: 1

Received By: **Yazmine Garduno**      3/20/2020 8:10:00 AM      *[Signature]*  
 Completed By: **Leah Baca**      3/20/2020 8:59:26 AM      *[Signature]*  
 Reviewed By: **YB 3/20/20**

**Chain of Custody**

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

**Log In**

3. Was an attempt made to cool the samples?      Yes       No       NA   
 4. Were all samples received at a temperature of >0° C to 6.0°C      Yes       No       NA   
 5. Sample(s) in proper container(s)?      Yes       No   
 6. Sufficient sample volume for indicated test(s)?      Yes       No   
 7. Are samples (except VOA and ONG) properly preserved?      Yes       No   
 8. Was preservative added to bottles?      Yes       No       NA   
 9. Received at least 1 vial with headspace <1/4" for AQ VOA?      Yes       No       NA   
 10. Were any sample containers received broken?      Yes       No   
 11. Does paperwork match bottle labels?      Yes       No   
 (Note discrepancies on chain of custody)  
 12. Are matrices correctly identified on Chain of Custody?      Yes       No   
 13. Is it clear what analyses were requested?      Yes       No   
 14. Were all holding times able to be met?      Yes       No   
 (If no, notify customer for authorization.)

# of preserved bottles checked for pH: \_\_\_\_\_  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: **DAD 3/20/20**

**Special Handling (if applicable)**

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

16. Additional remarks:

**17. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.8	Good				
2	4.1	Good				
3	3.4	Good				
4	2.9	Good				



# Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 2003932

RcptNo: 1

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
5	5.1	Good				





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

June 16, 2020

Amanda Davis  
Devon Energy  
6488 Seven Rivers Highway  
Artesia, NM 88210  
TEL: (505) 350-1336  
FAX:

RE: Thistle Unit #048H

OrderNo.: 2006525

Dear Amanda Davis:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/10/2020 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

**Analytical Report**

Lab Order **2006525**

Date Reported: **6/16/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** SS20-02 0.5

**Project:** Thistle Unit #048H

**Collection Date:** 6/9/2020 10:30:00 AM

**Lab ID:** 2006525-001

**Matrix:** SOIL

**Received Date:** 6/10/2020 9:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/12/2020 10:09:06 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/12/2020 10:09:06 AM
Surr: DNOP	81.2	55.1-146		%Rec	1	6/12/2020 10:09:06 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	6/11/2020 3:20:48 PM
Surr: BFB	85.5	66.6-105		%Rec	1	6/11/2020 3:20:48 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Methyl tert-butyl ether (MTBE)	ND	0.099		mg/Kg	1	6/11/2020 3:20:48 PM
Benzene	ND	0.025		mg/Kg	1	6/11/2020 3:20:48 PM
Toluene	ND	0.050		mg/Kg	1	6/11/2020 3:20:48 PM
Ethylbenzene	ND	0.050		mg/Kg	1	6/11/2020 3:20:48 PM
Xylenes, Total	ND	0.099		mg/Kg	1	6/11/2020 3:20:48 PM
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	1	6/11/2020 3:20:48 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>MRA</b>
Chloride	180	60		mg/Kg	20	6/15/2020 12:16:59 PM

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order **2006525**

Date Reported: **6/16/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** SS20-04 0.5

**Project:** Thistle Unit #048H

**Collection Date:** 6/9/2020 11:30:00 AM

**Lab ID:** 2006525-002

**Matrix:** SOIL

**Received Date:** 6/10/2020 9:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	6/12/2020 10:19:10 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/12/2020 10:19:10 AM
Surr: DNOP	63.2	55.1-146		%Rec	1	6/12/2020 10:19:10 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/11/2020 6:06:34 PM
Surr: BFB	84.7	66.6-105		%Rec	1	6/11/2020 6:06:34 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Methyl tert-butyl ether (MTBE)	ND	0.093		mg/Kg	1	6/11/2020 6:06:34 PM
Benzene	ND	0.023		mg/Kg	1	6/11/2020 6:06:34 PM
Toluene	ND	0.047		mg/Kg	1	6/11/2020 6:06:34 PM
Ethylbenzene	ND	0.047		mg/Kg	1	6/11/2020 6:06:34 PM
Xylenes, Total	ND	0.093		mg/Kg	1	6/11/2020 6:06:34 PM
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/11/2020 6:06:34 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>MRA</b>
Chloride	270	60		mg/Kg	20	6/15/2020 12:29:23 PM

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2006525

16-Jun-20

**Client:** Devon Energy  
**Project:** Thistle Unit #048H

Sample ID: <b>MB-53078</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>53078</b>	RunNo: <b>69667</b>								
Prep Date: <b>6/15/2020</b>	Analysis Date: <b>6/15/2020</b>	SeqNo: <b>2418561</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-53078</b>	SampType: <b>lcs</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>53078</b>	RunNo: <b>69667</b>								
Prep Date: <b>6/15/2020</b>	Analysis Date: <b>6/15/2020</b>	SeqNo: <b>2418562</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.0	90	110			

**Qualifiers:**

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

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2006525

16-Jun-20

**Client:** Devon Energy  
**Project:** Thistle Unit #048H

Sample ID: <b>LCS-53019</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>53019</b>	RunNo: <b>69585</b>								
Prep Date: <b>6/11/2020</b>	Analysis Date: <b>6/12/2020</b>	SeqNo: <b>2415665</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	102	70	130			
Surr: DNOP	5.2		5.000		104	55.1	146			

Sample ID: <b>MB-53019</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>53019</b>	RunNo: <b>69585</b>								
Prep Date: <b>6/11/2020</b>	Analysis Date: <b>6/12/2020</b>	SeqNo: <b>2415666</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	13		10.00		127	55.1	146			

**Qualifiers:**

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

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2006525

16-Jun-20

**Client:** Devon Energy  
**Project:** Thistle Unit #048H

Sample ID: <b>2006525-001ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>SS20-02 0.5</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415148</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.6	23.23	0	91.8	80	120			
Surr: BFB	880		929.4		95.2	66.6	105			

Sample ID: <b>2006525-001amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>SS20-02 0.5</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415149</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.7	23.52	0	87.2	80	120	3.88	20	
Surr: BFB	900		940.7		95.7	66.6	105	0	0	

Sample ID: <b>lcs-53003</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415158</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.9	80	120			
Surr: BFB	940		1000		94.1	66.6	105			

Sample ID: <b>mb-53003</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415159</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	840		1000		84.5	66.6	105			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2006525

16-Jun-20

**Client:** Devon Energy  
**Project:** Thistle Unit #048H

Sample ID: <b>2006525-002ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>SS20-04 0.5</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415179</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.1	0.097	0.9653	0	119	21.6	180			
Benzene	0.99	0.024	0.9653	0	103	78.5	119			
Toluene	1.0	0.048	0.9653	0	107	75.7	123			
Ethylbenzene	1.1	0.048	0.9653	0	109	74.3	126			
Xylenes, Total	3.2	0.097	2.896	0	110	72.9	130			
Surr: 4-Bromofluorobenzene	1.0		0.9653		105	80	120			

Sample ID: <b>2006525-002amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>SS20-04 0.5</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415180</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.2	0.097	0.9671	0	123	21.6	180	3.65	20	
Benzene	1.0	0.024	0.9671	0	106	78.5	119	3.44	20	
Toluene	1.1	0.048	0.9671	0	112	75.7	123	5.24	20	
Ethylbenzene	1.1	0.048	0.9671	0	114	74.3	126	4.86	20	
Xylenes, Total	3.4	0.097	2.901	0	116	72.9	130	5.79	20	
Surr: 4-Bromofluorobenzene	1.0		0.9671		106	80	120	0	0	

Sample ID: <b>LCS-53003</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415188</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.1	0.10	1.000	0	112	20.7	175			
Benzene	0.95	0.025	1.000	0	95.5	80	120			
Toluene	0.97	0.050	1.000	0	97.3	80	120			
Ethylbenzene	0.97	0.050	1.000	0	96.5	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.2	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID: <b>mb-53003</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415189</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10								
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								

**Qualifiers:**

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

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2006525

16-Jun-20

**Client:** Devon Energy  
**Project:** Thistle Unit #048H

Sample ID: <b>mb-53003</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>53003</b>	RunNo: <b>69580</b>								
Prep Date: <b>6/10/2020</b>	Analysis Date: <b>6/11/2020</b>	SeqNo: <b>2415189</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		106	80	120			

**Qualifiers:**

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



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: DEVON ENERGY      Work Order Number: 2006525      RcptNo: 1

Received By: **Scott Anderson**      6/10/2020 9:10:00 AM

Completed By: **Juan Rojas**      6/10/2020 9:44:31 AM

Reviewed By: **DAD 6/10/20**

*Juan Rojas*

**Chain of Custody**

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

**Log In**

3. Was an attempt made to cool the samples?      Yes       No       NA
4. Were all samples received at a temperature of >0° C to 6.0°C      Yes       No       NA
5. Sample(s) in proper container(s)?      Yes       No       **Not required**
6. Sufficient sample volume for indicated test(s)?      Yes       No
7. Are samples (except VOA and ONG) properly preserved?      Yes       No
8. Was preservative added to bottles?      Yes       No       NA
9. Received at least 1 vial with headspace <1/4" for AQ VOA?      Yes       No       NA
10. Were any sample containers received broken?      Yes       No
11. Does paperwork match bottle labels?      Yes       No   
 (Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody?      Yes       No
13. Is it clear what analyses were requested?      Yes       No
14. Were all holding times able to be met?      Yes       No   
 (If no, notify customer for authorization.)

# of preserved bottles checked for pH: 10  
 6/10/20  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: \_\_\_\_\_

**Special Handling (if applicable)**

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

Person Notified:	<input type="text"/>	Date	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

16. Additional remarks:

**Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	7.7	Good				





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

November 02, 2020

Natalie Gordon

Devon Energy

6488 Seven Rivers Highway

Artesia, NM 88210

TEL: (505) 350-1336

FAX:

RE: Thistle Unit 048

OrderNo.: 2010B65

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 32 sample(s) on 10/24/2020 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-01 1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-001

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	270	60		mg/Kg	20	10/29/2020 8:39:49 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/27/2020 10:30:03 PM	56022
Surr: BFB	107	70-130		%Rec	1	10/27/2020 10:30:03 PM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/27/2020 5:45:23 PM	56030
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/27/2020 5:45:23 PM	56030
Surr: DNOP	83.9	30.4-154		%Rec	1	10/27/2020 5:45:23 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/27/2020 10:30:03 PM	56022
Toluene	ND	0.049		mg/Kg	1	10/27/2020 10:30:03 PM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/27/2020 10:30:03 PM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/27/2020 10:30:03 PM	56022
Surr: 1,2-Dichloroethane-d4	96.7	70-130		%Rec	1	10/27/2020 10:30:03 PM	56022
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	1	10/27/2020 10:30:03 PM	56022
Surr: Dibromofluoromethane	110	70-130		%Rec	1	10/27/2020 10:30:03 PM	56022
Surr: Toluene-d8	108	70-130		%Rec	1	10/27/2020 10:30:03 PM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-02 1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-002

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	200	60		mg/Kg	20	10/29/2020 9:17:03 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/27/2020 10:58:34 PM	56022
Surr: BFB	106	70-130		%Rec	1	10/27/2020 10:58:34 PM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/27/2020 6:09:18 PM	56030
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/27/2020 6:09:18 PM	56030
Surr: DNOP	87.8	30.4-154		%Rec	1	10/27/2020 6:09:18 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/27/2020 10:58:34 PM	56022
Toluene	ND	0.049		mg/Kg	1	10/27/2020 10:58:34 PM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/27/2020 10:58:34 PM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/27/2020 10:58:34 PM	56022
Surr: 1,2-Dichloroethane-d4	93.3	70-130		%Rec	1	10/27/2020 10:58:34 PM	56022
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	10/27/2020 10:58:34 PM	56022
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/27/2020 10:58:34 PM	56022
Surr: Toluene-d8	108	70-130		%Rec	1	10/27/2020 10:58:34 PM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

## Analytical Report

Lab Order 2010B65

Date Reported: 11/2/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy

Client Sample ID: BS20-03 1'

Project: Thistle Unit 048

Collection Date: 10/23/2020

Lab ID: 2010B65-003

Matrix: SOIL

Received Date: 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	260	60		mg/Kg	20	10/29/2020 9:54:16 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/27/2020 11:27:02 PM	56022
Surr: BFB	97.6	70-130		%Rec	1	10/27/2020 11:27:02 PM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/27/2020 6:33:23 PM	56030
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/27/2020 6:33:23 PM	56030
Surr: DNOP	81.5	30.4-154		%Rec	1	10/27/2020 6:33:23 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/27/2020 11:27:02 PM	56022
Toluene	ND	0.049		mg/Kg	1	10/27/2020 11:27:02 PM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/27/2020 11:27:02 PM	56022
Xylenes, Total	ND	0.097		mg/Kg	1	10/27/2020 11:27:02 PM	56022
Surr: 1,2-Dichloroethane-d4	90.7	70-130		%Rec	1	10/27/2020 11:27:02 PM	56022
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	10/27/2020 11:27:02 PM	56022
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/27/2020 11:27:02 PM	56022
Surr: Toluene-d8	104	70-130		%Rec	1	10/27/2020 11:27:02 PM	56022

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

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

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-04 1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-004

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	200	60		mg/Kg	20	10/29/2020 10:06:41 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/28/2020 1:50:00 AM	56022
Surr: BFB	106	70-130		%Rec	1	10/28/2020 1:50:00 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/27/2020 6:57:17 PM	56030
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/27/2020 6:57:17 PM	56030
Surr: DNOP	76.2	30.4-154		%Rec	1	10/27/2020 6:57:17 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 1:50:00 AM	56022
Toluene	ND	0.049		mg/Kg	1	10/28/2020 1:50:00 AM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/28/2020 1:50:00 AM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/28/2020 1:50:00 AM	56022
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	10/28/2020 1:50:00 AM	56022
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/28/2020 1:50:00 AM	56022
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/28/2020 1:50:00 AM	56022
Surr: Toluene-d8	105	70-130		%Rec	1	10/28/2020 1:50:00 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-05 1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-005

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	91	60		mg/Kg	20	10/29/2020 10:19:05 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/28/2020 2:18:28 AM	56022
Surr: BFB	105	70-130		%Rec	1	10/28/2020 2:18:28 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/27/2020 7:21:09 PM	56030
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/27/2020 7:21:09 PM	56030
Surr: DNOP	73.0	30.4-154		%Rec	1	10/27/2020 7:21:09 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/28/2020 2:18:28 AM	56022
Toluene	ND	0.049		mg/Kg	1	10/28/2020 2:18:28 AM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/28/2020 2:18:28 AM	56022
Xylenes, Total	ND	0.098		mg/Kg	1	10/28/2020 2:18:28 AM	56022
Surr: 1,2-Dichloroethane-d4	92.2	70-130		%Rec	1	10/28/2020 2:18:28 AM	56022
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/28/2020 2:18:28 AM	56022
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/28/2020 2:18:28 AM	56022
Surr: Toluene-d8	99.6	70-130		%Rec	1	10/28/2020 2:18:28 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-06 1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-006

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	89	60		mg/Kg	20	10/29/2020 10:31:30 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/28/2020 2:47:00 AM	56022
Surr: BFB	104	70-130		%Rec	1	10/28/2020 2:47:00 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	10/27/2020 7:44:58 PM	56030
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/27/2020 7:44:58 PM	56030
Surr: DNOP	72.4	30.4-154		%Rec	1	10/27/2020 7:44:58 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 2:47:00 AM	56022
Toluene	ND	0.050		mg/Kg	1	10/28/2020 2:47:00 AM	56022
Ethylbenzene	ND	0.050		mg/Kg	1	10/28/2020 2:47:00 AM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/28/2020 2:47:00 AM	56022
Surr: 1,2-Dichloroethane-d4	93.2	70-130		%Rec	1	10/28/2020 2:47:00 AM	56022
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/28/2020 2:47:00 AM	56022
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/28/2020 2:47:00 AM	56022
Surr: Toluene-d8	105	70-130		%Rec	1	10/28/2020 2:47:00 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

## Analytical Report

Lab Order 2010B65

Date Reported: 11/2/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy

Client Sample ID: BS20-07 2'

Project: Thistle Unit 048

Collection Date: 10/23/2020

Lab ID: 2010B65-007

Matrix: SOIL

Received Date: 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	76	60		mg/Kg	20	10/29/2020 10:43:54 PM	56115
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/28/2020 3:15:37 AM	56022
Surr: BFB	107	70-130		%Rec	1	10/28/2020 3:15:37 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/27/2020 8:08:52 PM	56030
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/27/2020 8:08:52 PM	56030
Surr: DNOP	65.5	30.4-154		%Rec	1	10/27/2020 8:08:52 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 3:15:37 AM	56022
Toluene	ND	0.049		mg/Kg	1	10/28/2020 3:15:37 AM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/28/2020 3:15:37 AM	56022
Xylenes, Total	ND	0.098		mg/Kg	1	10/28/2020 3:15:37 AM	56022
Surr: 1,2-Dichloroethane-d4	93.3	70-130		%Rec	1	10/28/2020 3:15:37 AM	56022
Surr: 4-Bromofluorobenzene	111	70-130		%Rec	1	10/28/2020 3:15:37 AM	56022
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/28/2020 3:15:37 AM	56022
Surr: Toluene-d8	105	70-130		%Rec	1	10/28/2020 3:15:37 AM	56022

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

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

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-08 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-008

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	77	59		mg/Kg	20	10/30/2020 1:18:12 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/28/2020 3:44:08 AM	56022
Surr: BFB	102	70-130		%Rec	1	10/28/2020 3:44:08 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/27/2020 8:32:32 PM	56030
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/27/2020 8:32:32 PM	56030
Surr: DNOP	69.1	30.4-154		%Rec	1	10/27/2020 8:32:32 PM	56030
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 3:44:08 AM	56022
Toluene	ND	0.050		mg/Kg	1	10/28/2020 3:44:08 AM	56022
Ethylbenzene	ND	0.050		mg/Kg	1	10/28/2020 3:44:08 AM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/28/2020 3:44:08 AM	56022
Surr: 1,2-Dichloroethane-d4	95.2	70-130		%Rec	1	10/28/2020 3:44:08 AM	56022
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/28/2020 3:44:08 AM	56022
Surr: Dibromofluoromethane	108	70-130		%Rec	1	10/28/2020 3:44:08 AM	56022
Surr: Toluene-d8	104	70-130		%Rec	1	10/28/2020 3:44:08 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-09 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-009

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	150	60		mg/Kg	20	10/30/2020 1:55:25 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/28/2020 4:12:35 AM	56022
Surr: BFB	103	70-130		%Rec	1	10/28/2020 4:12:35 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	10/27/2020 7:43:06 PM	56033
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/27/2020 7:43:06 PM	56033
Surr: DNOP	96.5	30.4-154		%Rec	1	10/27/2020 7:43:06 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 4:12:35 AM	56022
Toluene	ND	0.050		mg/Kg	1	10/28/2020 4:12:35 AM	56022
Ethylbenzene	ND	0.050		mg/Kg	1	10/28/2020 4:12:35 AM	56022
Xylenes, Total	ND	0.10		mg/Kg	1	10/28/2020 4:12:35 AM	56022
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	10/28/2020 4:12:35 AM	56022
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	10/28/2020 4:12:35 AM	56022
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/28/2020 4:12:35 AM	56022
Surr: Toluene-d8	100	70-130		%Rec	1	10/28/2020 4:12:35 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-10 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-010

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	150	60		mg/Kg	20	10/30/2020 2:32:38 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/28/2020 4:41:07 AM	56022
Surr: BFB	108	70-130		%Rec	1	10/28/2020 4:41:07 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/27/2020 8:52:37 PM	56033
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/27/2020 8:52:37 PM	56033
Surr: DNOP	89.0	30.4-154		%Rec	1	10/27/2020 8:52:37 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 4:41:07 AM	56022
Toluene	ND	0.050		mg/Kg	1	10/28/2020 4:41:07 AM	56022
Ethylbenzene	ND	0.050		mg/Kg	1	10/28/2020 4:41:07 AM	56022
Xylenes, Total	ND	0.099		mg/Kg	1	10/28/2020 4:41:07 AM	56022
Surr: 1,2-Dichloroethane-d4	94.2	70-130		%Rec	1	10/28/2020 4:41:07 AM	56022
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	10/28/2020 4:41:07 AM	56022
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/28/2020 4:41:07 AM	56022
Surr: Toluene-d8	103	70-130		%Rec	1	10/28/2020 4:41:07 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-11 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-011

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	100	60		mg/Kg	20	10/30/2020 2:45:03 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/28/2020 5:09:51 AM	56022
Surr: BFB	110	70-130		%Rec	1	10/28/2020 5:09:51 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/27/2020 9:15:47 PM	56033
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/27/2020 9:15:47 PM	56033
Surr: DNOP	87.0	30.4-154		%Rec	1	10/27/2020 9:15:47 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/28/2020 5:09:51 AM	56022
Toluene	ND	0.049		mg/Kg	1	10/28/2020 5:09:51 AM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/28/2020 5:09:51 AM	56022
Xylenes, Total	ND	0.097		mg/Kg	1	10/28/2020 5:09:51 AM	56022
Surr: 1,2-Dichloroethane-d4	94.7	70-130		%Rec	1	10/28/2020 5:09:51 AM	56022
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	10/28/2020 5:09:51 AM	56022
Surr: Dibromofluoromethane	107	70-130		%Rec	1	10/28/2020 5:09:51 AM	56022
Surr: Toluene-d8	109	70-130		%Rec	1	10/28/2020 5:09:51 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-12 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-012

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	150	60		mg/Kg	20	10/30/2020 2:57:27 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/28/2020 5:38:27 AM	56022
Surr: BFB	108	70-130		%Rec	1	10/28/2020 5:38:27 AM	56022
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/27/2020 9:38:57 PM	56033
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/27/2020 9:38:57 PM	56033
Surr: DNOP	93.1	30.4-154		%Rec	1	10/27/2020 9:38:57 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/28/2020 5:38:27 AM	56022
Toluene	ND	0.049		mg/Kg	1	10/28/2020 5:38:27 AM	56022
Ethylbenzene	ND	0.049		mg/Kg	1	10/28/2020 5:38:27 AM	56022
Xylenes, Total	ND	0.098		mg/Kg	1	10/28/2020 5:38:27 AM	56022
Surr: 1,2-Dichloroethane-d4	95.8	70-130		%Rec	1	10/28/2020 5:38:27 AM	56022
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/28/2020 5:38:27 AM	56022
Surr: Dibromofluoromethane	107	70-130		%Rec	1	10/28/2020 5:38:27 AM	56022
Surr: Toluene-d8	109	70-130		%Rec	1	10/28/2020 5:38:27 AM	56022

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

## Analytical Report

Lab Order 2010B65

Date Reported: 11/2/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy

Client Sample ID: BS20-13 2'

Project: Thistle Unit 048

Collection Date: 10/23/2020

Lab ID: 2010B65-013

Matrix: SOIL

Received Date: 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: CAS
Chloride	93	60		mg/Kg	20	10/30/2020 3:09:52 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 2:11:00 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 2:11:00 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/27/2020 10:02:06 PM	56033
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/27/2020 10:02:06 PM	56033
Surr: DNOP	92.9	30.4-154		%Rec	1	10/27/2020 10:02:06 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	10/26/2020 2:11:00 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 2:11:00 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 2:11:00 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 2:11:00 PM	56023
Surr: 1,2-Dichloroethane-d4	91.8	70-130		%Rec	1	10/26/2020 2:11:00 PM	56023
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/26/2020 2:11:00 PM	56023
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/26/2020 2:11:00 PM	56023
Surr: Toluene-d8	99.5	70-130		%Rec	1	10/26/2020 2:11:00 PM	56023

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

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

Page 13 of 39

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-14 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-014

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	67	59		mg/Kg	20	10/30/2020 3:22:16 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 3:36:16 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 3:36:16 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/27/2020 10:25:18 PM	56033
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/27/2020 10:25:18 PM	56033
Surr: DNOP	82.4	30.4-154		%Rec	1	10/27/2020 10:25:18 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 3:36:16 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 3:36:16 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 3:36:16 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 3:36:16 PM	56023
Surr: 1,2-Dichloroethane-d4	90.3	70-130		%Rec	1	10/26/2020 3:36:16 PM	56023
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/26/2020 3:36:16 PM	56023
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/26/2020 3:36:16 PM	56023
Surr: Toluene-d8	99.6	70-130		%Rec	1	10/26/2020 3:36:16 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-15 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-015

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	75	60		mg/Kg	20	10/30/2020 3:34:40 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 5:01:15 PM	56023
Surr: BFB	105	70-130		%Rec	1	10/26/2020 5:01:15 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	10/27/2020 10:48:26 PM	56033
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/27/2020 10:48:26 PM	56033
Surr: DNOP	79.6	30.4-154		%Rec	1	10/27/2020 10:48:26 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/26/2020 5:01:15 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 5:01:15 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 5:01:15 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 5:01:15 PM	56023
Surr: 1,2-Dichloroethane-d4	95.2	70-130		%Rec	1	10/26/2020 5:01:15 PM	56023
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	10/26/2020 5:01:15 PM	56023
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/26/2020 5:01:15 PM	56023
Surr: Toluene-d8	98.5	70-130		%Rec	1	10/26/2020 5:01:15 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-16 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-016

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	97	60		mg/Kg	20	10/30/2020 3:47:04 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 5:29:38 PM	56023
Surr: BFB	107	70-130		%Rec	1	10/26/2020 5:29:38 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/27/2020 11:11:37 PM	56033
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/27/2020 11:11:37 PM	56033
Surr: DNOP	84.5	30.4-154		%Rec	1	10/27/2020 11:11:37 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 5:29:38 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 5:29:38 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 5:29:38 PM	56023
Xylenes, Total	ND	0.10		mg/Kg	1	10/26/2020 5:29:38 PM	56023
Surr: 1,2-Dichloroethane-d4	96.4	70-130		%Rec	1	10/26/2020 5:29:38 PM	56023
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/26/2020 5:29:38 PM	56023
Surr: Dibromofluoromethane	101	70-130		%Rec	1	10/26/2020 5:29:38 PM	56023
Surr: Toluene-d8	99.3	70-130		%Rec	1	10/26/2020 5:29:38 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-17 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-017

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	130	60		mg/Kg	20	10/30/2020 3:59:29 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 5:57:57 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 5:57:57 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/27/2020 11:34:47 PM	56033
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/27/2020 11:34:47 PM	56033
Surr: DNOP	76.9	30.4-154		%Rec	1	10/27/2020 11:34:47 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 5:57:57 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 5:57:57 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 5:57:57 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 5:57:57 PM	56023
Surr: 1,2-Dichloroethane-d4	98.1	70-130		%Rec	1	10/26/2020 5:57:57 PM	56023
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/26/2020 5:57:57 PM	56023
Surr: Dibromofluoromethane	110	70-130		%Rec	1	10/26/2020 5:57:57 PM	56023
Surr: Toluene-d8	98.1	70-130		%Rec	1	10/26/2020 5:57:57 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-18 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-018

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	94	60		mg/Kg	20	10/30/2020 4:11:53 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 6:26:15 PM	56023
Surr: BFB	103	70-130		%Rec	1	10/26/2020 6:26:15 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/27/2020 11:57:57 PM	56033
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/27/2020 11:57:57 PM	56033
Surr: DNOP	96.4	30.4-154		%Rec	1	10/27/2020 11:57:57 PM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 6:26:15 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 6:26:15 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 6:26:15 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 6:26:15 PM	56023
Surr: 1,2-Dichloroethane-d4	96.9	70-130		%Rec	1	10/26/2020 6:26:15 PM	56023
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/26/2020 6:26:15 PM	56023
Surr: Dibromofluoromethane	107	70-130		%Rec	1	10/26/2020 6:26:15 PM	56023
Surr: Toluene-d8	99.6	70-130		%Rec	1	10/26/2020 6:26:15 PM	56023

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

**Qualifiers:**

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

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-19 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-019

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	74	60		mg/Kg	20	10/30/2020 4:24:17 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 6:54:32 PM	56023
Surr: BFB	103	70-130		%Rec	1	10/26/2020 6:54:32 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.5		mg/Kg	1	10/28/2020 12:21:09 AM	56033
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	10/28/2020 12:21:09 AM	56033
Surr: DNOP	93.1	30.4-154		%Rec	1	10/28/2020 12:21:09 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 6:54:32 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 6:54:32 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 6:54:32 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 6:54:32 PM	56023
Surr: 1,2-Dichloroethane-d4	91.4	70-130		%Rec	1	10/26/2020 6:54:32 PM	56023
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	10/26/2020 6:54:32 PM	56023
Surr: Dibromofluoromethane	100	70-130		%Rec	1	10/26/2020 6:54:32 PM	56023
Surr: Toluene-d8	94.5	70-130		%Rec	1	10/26/2020 6:54:32 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

## Analytical Report

Lab Order 2010B65

Date Reported: 11/2/2020

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy

Client Sample ID: BS20-20 2'

Project: Thistle Unit 048

Collection Date: 10/23/2020

Lab ID: 2010B65-020

Matrix: SOIL

Received Date: 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: CAS
Chloride	90	59		mg/Kg	20	10/30/2020 5:01:32 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 7:22:52 PM	56023
Surr: BFB	104	70-130		%Rec	1	10/26/2020 7:22:52 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	10/28/2020 12:44:23 AM	56033
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/28/2020 12:44:23 AM	56033
Surr: DNOP	98.1	30.4-154		%Rec	1	10/28/2020 12:44:23 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	10/26/2020 7:22:52 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 7:22:52 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 7:22:52 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 7:22:52 PM	56023
Surr: 1,2-Dichloroethane-d4	95.7	70-130		%Rec	1	10/26/2020 7:22:52 PM	56023
Surr: 4-Bromofluorobenzene	113	70-130		%Rec	1	10/26/2020 7:22:52 PM	56023
Surr: Dibromofluoromethane	98.1	70-130		%Rec	1	10/26/2020 7:22:52 PM	56023
Surr: Toluene-d8	99.1	70-130		%Rec	1	10/26/2020 7:22:52 PM	56023

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

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

Page 20 of 39

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-21 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-021

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	150	60		mg/Kg	20	10/30/2020 5:13:57 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 7:51:10 PM	56023
Surr: BFB	104	70-130		%Rec	1	10/26/2020 7:51:10 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	10/28/2020 1:07:33 AM	56033
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/28/2020 1:07:33 AM	56033
Surr: DNOP	99.4	30.4-154		%Rec	1	10/28/2020 1:07:33 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 7:51:10 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 7:51:10 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 7:51:10 PM	56023
Xylenes, Total	ND	0.10		mg/Kg	1	10/26/2020 7:51:10 PM	56023
Surr: 1,2-Dichloroethane-d4	90.0	70-130		%Rec	1	10/26/2020 7:51:10 PM	56023
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	10/26/2020 7:51:10 PM	56023
Surr: Dibromofluoromethane	109	70-130		%Rec	1	10/26/2020 7:51:10 PM	56023
Surr: Toluene-d8	98.0	70-130		%Rec	1	10/26/2020 7:51:10 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-22 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-022

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	110	59		mg/Kg	20	10/30/2020 5:26:21 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 8:19:26 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 8:19:26 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	10/28/2020 1:30:45 AM	56033
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/28/2020 1:30:45 AM	56033
Surr: DNOP	92.0	30.4-154		%Rec	1	10/28/2020 1:30:45 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 8:19:26 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 8:19:26 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 8:19:26 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 8:19:26 PM	56023
Surr: 1,2-Dichloroethane-d4	94.5	70-130		%Rec	1	10/26/2020 8:19:26 PM	56023
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	10/26/2020 8:19:26 PM	56023
Surr: Dibromofluoromethane	98.1	70-130		%Rec	1	10/26/2020 8:19:26 PM	56023
Surr: Toluene-d8	97.0	70-130		%Rec	1	10/26/2020 8:19:26 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-23 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-023

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	84	60		mg/Kg	20	10/30/2020 5:38:46 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 8:47:42 PM	56023
Surr: BFB	100	70-130		%Rec	1	10/26/2020 8:47:42 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/28/2020 1:53:57 AM	56033
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/28/2020 1:53:57 AM	56033
Surr: DNOP	90.6	30.4-154		%Rec	1	10/28/2020 1:53:57 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 8:47:42 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 8:47:42 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 8:47:42 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 8:47:42 PM	56023
Surr: 1,2-Dichloroethane-d4	88.9	70-130		%Rec	1	10/26/2020 8:47:42 PM	56023
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/26/2020 8:47:42 PM	56023
Surr: Dibromofluoromethane	100	70-130		%Rec	1	10/26/2020 8:47:42 PM	56023
Surr: Toluene-d8	102	70-130		%Rec	1	10/26/2020 8:47:42 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** BS20-24 2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-024

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	100	60		mg/Kg	20	10/30/2020 5:51:11 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 9:15:55 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 9:15:55 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.0		mg/Kg	1	10/28/2020 2:17:09 AM	56033
Motor Oil Range Organics (MRO)	ND	40		mg/Kg	1	10/28/2020 2:17:09 AM	56033
Surr: DNOP	84.4	30.4-154		%Rec	1	10/28/2020 2:17:09 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 9:15:55 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 9:15:55 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 9:15:55 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 9:15:55 PM	56023
Surr: 1,2-Dichloroethane-d4	91.3	70-130		%Rec	1	10/26/2020 9:15:55 PM	56023
Surr: 4-Bromofluorobenzene	113	70-130		%Rec	1	10/26/2020 9:15:55 PM	56023
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	10/26/2020 9:15:55 PM	56023
Surr: Toluene-d8	100	70-130		%Rec	1	10/26/2020 9:15:55 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order **2010B65**

Date Reported: **11/2/2020**

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-01 0-1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-025

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	93	60		mg/Kg	20	10/30/2020 6:03:35 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 9:44:09 PM	56023
Surr: BFB	106	70-130		%Rec	1	10/26/2020 9:44:09 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.5		mg/Kg	1	10/28/2020 2:40:23 AM	56033
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/28/2020 2:40:23 AM	56033
Surr: DNOP	88.3	30.4-154		%Rec	1	10/28/2020 2:40:23 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/26/2020 9:44:09 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 9:44:09 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 9:44:09 PM	56023
Xylenes, Total	ND	0.098		mg/Kg	1	10/26/2020 9:44:09 PM	56023
Surr: 1,2-Dichloroethane-d4	90.9	70-130		%Rec	1	10/26/2020 9:44:09 PM	56023
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	10/26/2020 9:44:09 PM	56023
Surr: Dibromofluoromethane	97.8	70-130		%Rec	1	10/26/2020 9:44:09 PM	56023
Surr: Toluene-d8	98.7	70-130		%Rec	1	10/26/2020 9:44:09 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-02 0-1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-026

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	250	60		mg/Kg	20	10/30/2020 6:15:59 PM	56117
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 10:12:20 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 10:12:20 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/28/2020 3:03:32 AM	56033
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/28/2020 3:03:32 AM	56033
Surr: DNOP	74.5	30.4-154		%Rec	1	10/28/2020 3:03:32 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 10:12:20 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 10:12:20 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 10:12:20 PM	56023
Xylenes, Total	ND	0.10		mg/Kg	1	10/26/2020 10:12:20 PM	56023
Surr: 1,2-Dichloroethane-d4	91.0	70-130		%Rec	1	10/26/2020 10:12:20 PM	56023
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	1	10/26/2020 10:12:20 PM	56023
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/26/2020 10:12:20 PM	56023
Surr: Toluene-d8	101	70-130		%Rec	1	10/26/2020 10:12:20 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-03 0-1'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-027

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	250	60		mg/Kg	20	10/30/2020 7:18:02 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 10:40:31 PM	56023
Surr: BFB	96.3	70-130		%Rec	1	10/26/2020 10:40:31 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/28/2020 3:26:44 AM	56033
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/28/2020 3:26:44 AM	56033
Surr: DNOP	87.5	30.4-154		%Rec	1	10/28/2020 3:26:44 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 10:40:31 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 10:40:31 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 10:40:31 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 10:40:31 PM	56023
Surr: 1,2-Dichloroethane-d4	89.2	70-130		%Rec	1	10/26/2020 10:40:31 PM	56023
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/26/2020 10:40:31 PM	56023
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/26/2020 10:40:31 PM	56023
Surr: Toluene-d8	98.2	70-130		%Rec	1	10/26/2020 10:40:31 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-04 0-2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-028

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	240	61		mg/Kg	20	10/30/2020 7:30:26 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/26/2020 11:08:40 PM	56023
Surr: BFB	102	70-130		%Rec	1	10/26/2020 11:08:40 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	10/28/2020 3:49:55 AM	56033
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/28/2020 3:49:55 AM	56033
Surr: DNOP	73.5	30.4-154		%Rec	1	10/28/2020 3:49:55 AM	56033
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 11:08:40 PM	56023
Toluene	ND	0.050		mg/Kg	1	10/26/2020 11:08:40 PM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/26/2020 11:08:40 PM	56023
Xylenes, Total	ND	0.10		mg/Kg	1	10/26/2020 11:08:40 PM	56023
Surr: 1,2-Dichloroethane-d4	89.8	70-130		%Rec	1	10/26/2020 11:08:40 PM	56023
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	10/26/2020 11:08:40 PM	56023
Surr: Dibromofluoromethane	101	70-130		%Rec	1	10/26/2020 11:08:40 PM	56023
Surr: Toluene-d8	102	70-130		%Rec	1	10/26/2020 11:08:40 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-05 0-2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-029

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	240	60		mg/Kg	20	10/30/2020 7:42:51 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/26/2020 11:36:49 PM	56023
Surr: BFB	99.0	70-130		%Rec	1	10/26/2020 11:36:49 PM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/28/2020 12:35:47 PM	56057
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/28/2020 12:35:47 PM	56057
Surr: DNOP	109	30.4-154		%Rec	1	10/28/2020 12:35:47 PM	56057
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/26/2020 11:36:49 PM	56023
Toluene	ND	0.049		mg/Kg	1	10/26/2020 11:36:49 PM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/26/2020 11:36:49 PM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/26/2020 11:36:49 PM	56023
Surr: 1,2-Dichloroethane-d4	85.5	70-130		%Rec	1	10/26/2020 11:36:49 PM	56023
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/26/2020 11:36:49 PM	56023
Surr: Dibromofluoromethane	99.8	70-130		%Rec	1	10/26/2020 11:36:49 PM	56023
Surr: Toluene-d8	98.1	70-130		%Rec	1	10/26/2020 11:36:49 PM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-06 0-2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-030

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	260	60		mg/Kg	20	10/30/2020 7:55:15 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/27/2020 1:57:39 AM	56023
Surr: BFB	98.7	70-130		%Rec	1	10/27/2020 1:57:39 AM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/28/2020 12:59:28 PM	56057
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/28/2020 12:59:28 PM	56057
Surr: DNOP	112	30.4-154		%Rec	1	10/28/2020 12:59:28 PM	56057
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.024		mg/Kg	1	10/27/2020 1:57:39 AM	56023
Toluene	ND	0.049		mg/Kg	1	10/27/2020 1:57:39 AM	56023
Ethylbenzene	ND	0.049		mg/Kg	1	10/27/2020 1:57:39 AM	56023
Xylenes, Total	ND	0.097		mg/Kg	1	10/27/2020 1:57:39 AM	56023
Surr: 1,2-Dichloroethane-d4	92.2	70-130		%Rec	1	10/27/2020 1:57:39 AM	56023
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/27/2020 1:57:39 AM	56023
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/27/2020 1:57:39 AM	56023
Surr: Toluene-d8	103	70-130		%Rec	1	10/27/2020 1:57:39 AM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-07 0-2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-031

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	230	59		mg/Kg	20	10/30/2020 8:07:40 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/27/2020 2:25:46 AM	56023
Surr: BFB	104	70-130		%Rec	1	10/27/2020 2:25:46 AM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/28/2020 1:23:08 PM	56057
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/28/2020 1:23:08 PM	56057
Surr: DNOP	104	30.4-154		%Rec	1	10/28/2020 1:23:08 PM	56057
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/27/2020 2:25:46 AM	56023
Toluene	ND	0.050		mg/Kg	1	10/27/2020 2:25:46 AM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/27/2020 2:25:46 AM	56023
Xylenes, Total	ND	0.099		mg/Kg	1	10/27/2020 2:25:46 AM	56023
Surr: 1,2-Dichloroethane-d4	88.1	70-130		%Rec	1	10/27/2020 2:25:46 AM	56023
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	1	10/27/2020 2:25:46 AM	56023
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	10/27/2020 2:25:46 AM	56023
Surr: Toluene-d8	104	70-130		%Rec	1	10/27/2020 2:25:46 AM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

**Analytical Report**

Lab Order 2010B65

Date Reported: 11/2/2020

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Devon Energy

**Client Sample ID:** WS20-08 0-2'

**Project:** Thistle Unit 048

**Collection Date:** 10/23/2020

**Lab ID:** 2010B65-032

**Matrix:** SOIL

**Received Date:** 10/24/2020 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>CAS</b>
Chloride	250	60		mg/Kg	20	10/30/2020 8:20:04 PM	56124
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>JMR</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/27/2020 2:54:01 AM	56023
Surr: BFB	102	70-130		%Rec	1	10/27/2020 2:54:01 AM	56023
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	10/28/2020 1:46:46 PM	56057
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/28/2020 1:46:46 PM	56057
Surr: DNOP	110	30.4-154		%Rec	1	10/28/2020 1:46:46 PM	56057
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>JMR</b>
Benzene	ND	0.025		mg/Kg	1	10/27/2020 2:54:01 AM	56023
Toluene	ND	0.050		mg/Kg	1	10/27/2020 2:54:01 AM	56023
Ethylbenzene	ND	0.050		mg/Kg	1	10/27/2020 2:54:01 AM	56023
Xylenes, Total	ND	0.10		mg/Kg	1	10/27/2020 2:54:01 AM	56023
Surr: 1,2-Dichloroethane-d4	91.1	70-130		%Rec	1	10/27/2020 2:54:01 AM	56023
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	10/27/2020 2:54:01 AM	56023
Surr: Dibromofluoromethane	99.5	70-130		%Rec	1	10/27/2020 2:54:01 AM	56023
Surr: Toluene-d8	104	70-130		%Rec	1	10/27/2020 2:54:01 AM	56023

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>MB-56115</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56115</b>	RunNo: <b>73026</b>								
Prep Date: <b>10/29/2020</b>	Analysis Date: <b>10/29/2020</b>	SeqNo: <b>2567344</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-56115</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56115</b>	RunNo: <b>73026</b>								
Prep Date: <b>10/29/2020</b>	Analysis Date: <b>10/29/2020</b>	SeqNo: <b>2567345</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.9	90	110			

Sample ID: <b>MB-56117</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56117</b>	RunNo: <b>73036</b>								
Prep Date: <b>10/30/2020</b>	Analysis Date: <b>10/30/2020</b>	SeqNo: <b>2568648</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-56117</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56117</b>	RunNo: <b>73036</b>								
Prep Date: <b>10/30/2020</b>	Analysis Date: <b>10/30/2020</b>	SeqNo: <b>2568649</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.6	90	110			

Sample ID: <b>MB-54124</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56124</b>	RunNo: <b>73036</b>								
Prep Date: <b>10/30/2020</b>	Analysis Date: <b>10/30/2020</b>	SeqNo: <b>2568678</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-54124</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56124</b>	RunNo: <b>73036</b>								
Prep Date: <b>10/30/2020</b>	Analysis Date: <b>10/30/2020</b>	SeqNo: <b>2568679</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.3	90	110			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>MB-56033</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56033</b>	RunNo: <b>72961</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565187</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.9		10.00		99.1	30.4	154			

Sample ID: <b>LCS-56033</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56033</b>	RunNo: <b>72961</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565188</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.1	70	130			
Surr: DNOP	4.8		5.000		95.7	30.4	154			

Sample ID: <b>2010B65-009AMS</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>BS20-09 2'</b>	Batch ID: <b>56033</b>	RunNo: <b>72961</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565190</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	9.4	47.21	0	91.4	15	184			
Surr: DNOP	4.6		4.721		98.4	30.4	154			

Sample ID: <b>2010B65-009AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>BS20-09 2'</b>	Batch ID: <b>56033</b>	RunNo: <b>72961</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565191</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	34	9.4	47.04	0	71.9	15	184	24.3	23.9	R
Surr: DNOP	3.6		4.704		76.6	30.4	154	0	0	

Sample ID: <b>LCS-56030</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56030</b>	RunNo: <b>72933</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565384</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	92.6	70	130			
Surr: DNOP	4.3		5.000		85.3	30.4	154			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>MB-56030</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56030</b>	RunNo: <b>72933</b>								
Prep Date: <b>10/26/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565385</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		90.5	30.4	154			

Sample ID: <b>MB-56057</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56057</b>	RunNo: <b>72966</b>								
Prep Date: <b>10/27/2020</b>	Analysis Date: <b>10/28/2020</b>	SeqNo: <b>2565454</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		113	30.4	154			

Sample ID: <b>LCS-56057</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>56057</b>	RunNo: <b>72966</b>								
Prep Date: <b>10/27/2020</b>	Analysis Date: <b>10/28/2020</b>	SeqNo: <b>2565485</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	10	50.00	0	111	70	130			
Surr: DNOP	5.8		5.000		115	30.4	154			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>ics-56023</b>	SampType: <b>LCS4</b>		TestCode: <b>EPA Method 8260B: Volatiles Short List</b>							
Client ID: <b>BatchQC</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563933</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	94.2	80	120			
Toluene	1.1	0.050	1.000	0	107	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.4	0.10	3.000	0	112	80	120			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.1	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		108	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		105	70	130			
Surr: Toluene-d8	0.50		0.5000		99.4	70	130			

Sample ID: <b>mb-56023</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260B: Volatiles Short List</b>							
Client ID: <b>PBS</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563934</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.2	70	130			
Surr: 4-Bromofluorobenzene	0.55		0.5000		110	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.50		0.5000		99.4	70	130			

Sample ID: <b>2010b65-013ams</b>	SampType: <b>MS4</b>		TestCode: <b>EPA Method 8260B: Volatiles Short List</b>							
Client ID: <b>BS20-13 2'</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563937</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9862	0	105	71.1	115			
Toluene	1.1	0.049	0.9862	0	113	79.6	132			
Ethylbenzene	1.2	0.049	0.9862	0	117	83.8	134			
Xylenes, Total	3.7	0.099	2.959	0	124	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.47		0.4931		95.1	70	130			
Surr: 4-Bromofluorobenzene	0.53		0.4931		107	70	130			
Surr: Dibromofluoromethane	0.52		0.4931		105	70	130			
Surr: Toluene-d8	0.47		0.4931		95.7	70	130			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>2010b65-013amsd</b>	SampType: <b>MSD4</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>BS20-13 2'</b>	Batch ID: <b>56023</b>	RunNo: <b>72935</b>								
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>	SeqNo: <b>2563938</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9872	0	105	71.1	115	0.547	20	
Toluene	1.1	0.049	0.9872	0	116	79.6	132	2.63	20	
Ethylbenzene	1.2	0.049	0.9872	0	117	83.8	134	0.0258	20	
Xylenes, Total	3.7	0.099	2.962	0	123	82.4	132	0.544	20	
Surr: 1,2-Dichloroethane-d4	0.49		0.4936		98.4	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.52		0.4936		106	70	130	0	0	
Surr: Dibromofluoromethane	0.54		0.4936		109	70	130	0	0	
Surr: Toluene-d8	0.48		0.4936		98.2	70	130	0	0	

Sample ID: <b>Ics-56022</b>	SampType: <b>LCS4</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>BatchQC</b>	Batch ID: <b>56022</b>	RunNo: <b>72964</b>								
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565392</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	94.3	80	120			
Toluene	1.1	0.050	1.000	0	111	80	120			
Ethylbenzene	1.0	0.050	1.000	0	104	80	120			
Xylenes, Total	3.4	0.10	3.000	0	114	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		94.0	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.6	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		105	70	130			
Surr: Toluene-d8	0.52		0.5000		105	70	130			

Sample ID: <b>mb-56022</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>PBS</b>	Batch ID: <b>56022</b>	RunNo: <b>72964</b>								
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/27/2020</b>	SeqNo: <b>2565393</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.5	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		109	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	70	130			
Surr: Toluene-d8	0.53		0.5000		105	70	130			

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>ics-56023</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563960</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	91.9	70	130			
Surr: BFB	510		500.0		101	70	130			

Sample ID: <b>mb-56023</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563961</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	510		500.0		101	70	130			

Sample ID: <b>2010b65-014ams</b>	SampType: <b>MS</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>BS20-14 2'</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563964</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.93	0	97.2	49.2	122			
Surr: BFB	500		498.5		101	70	130			

Sample ID: <b>2010b65-014amsd</b>	SampType: <b>MSD</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>BS20-14 2'</b>	Batch ID: <b>56023</b>		RunNo: <b>72935</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/26/2020</b>		SeqNo: <b>2563965</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.9	24.39	0	96.3	49.2	122	3.16	20	
Surr: BFB	490		487.8		101	70	130	0	0	

Sample ID: <b>ics-56022</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>56022</b>		RunNo: <b>72964</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/27/2020</b>		SeqNo: <b>2565422</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	85.4	70	130			
Surr: BFB	510		500.0		101	70	130			

Sample ID: <b>mb-56022</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>56022</b>		RunNo: <b>72964</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/27/2020</b>		SeqNo: <b>2565423</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:**

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

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2010B65

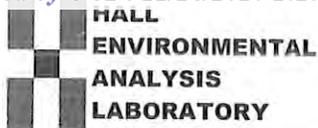
02-Nov-20

**Client:** Devon Energy  
**Project:** Thistle Unit 048

Sample ID: <b>mb-56022</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>56022</b>		RunNo: <b>72964</b>							
Prep Date: <b>10/25/2020</b>	Analysis Date: <b>10/27/2020</b>		SeqNo: <b>2565423</b>				Units: <b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	540		500.0		108	70	130			

**Qualifiers:**

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



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

Sample Log-In Check List

Client Name: Devon Energy Work Order Number: 2010B65 RcptNo: 1

Received By: Desiree Dominguez 10/24/2020 8:45:00 AM
Completed By: Desiree Dominguez 10/23/2020 4:28:33 PM
Reviewed By: [Signature] 10/24/2020

Chain of Custody

- 1. Is Chain of Custody complete? Yes [checked] No [ ] Not Present [ ]
2. How was the sample delivered? Courier

Log In

- 3. Was an attempt made to cool the samples? Yes [checked] No [ ] NA [ ]
4. Were all samples received at a temperature of >0° C to 6.0° C? Yes [checked] No [ ] NA [ ]
5. Sample(s) in proper container(s)? Yes [checked] No [ ]
6. Sufficient sample volume for indicated test(s)? Yes [checked] No [ ]
7. Are samples (except VOA and ONG) properly preserved? Yes [checked] No [ ]
8. Was preservative added to bottles? Yes [ ] No [checked] NA [ ]
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes [ ] No [ ] NA [checked]
10. Were any sample containers received broken? Yes [ ] No [checked]
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes [checked] No [ ]
12. Are matrices correctly identified on Chain of Custody? Yes [checked] No [ ]
13. Is it clear what analyses were requested? Yes [checked] No [ ]
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes [checked] No [ ]

# of preserved bottles checked for pH: (<2 or >12 unless noted)
Adjusted?
Checked by: DAD 10/24/20

Special Handling (if applicable)

- 15. Was client notified of all discrepancies with this order? Yes [ ] No [ ] NA [checked]

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

16. Additional remarks:

17. Cooler Information

Table with 7 columns: Cooler No, Temp °C, Condition, Seal Intact, Seal No, Seal Date, Signed By. Row 1: 1, 3.2, Good, Not Present, [ ], [ ], [ ]

# Chain-of-Custody Record

Client: Duven

Mailing Address: on file

Phone #: ↓

email or Fax#: ↓

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

Accreditation:  Az Compliance  
 NELAC  Other

EDD (Type)

Turn-Around Time: 5 Day Turn

Standard  Rush

Project Name: Thistle Unit 048

Project #: 20E-0041-066

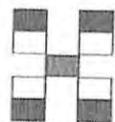
Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice:  Yes  No

# of Coolers: 1

Cooler Temp (including CF): 3.1 + 0.1 = 3.2 (°C)



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

### Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/23/20		Soil	BS20-01 1'	4oz jar	ICE	-001	X	X					X			
			BS20-02 1'			-002										
			BS20-03 1'			-003										
			BS20-04 1'			-004										
			BS20-05 1'			-005										
			BS20-06 1'			-006										
			BS20-07 2'			-007										
			BS20-08 2'			-008										
			BS20-09 2'			-009										
			BS20-10 2'			-010										
			BS20-11 2'			-011										
			BS20-12 2'			-012										

Date: 10/23/20 Time: 1:15pm Relinquished by: Kevin Smith Received by: [Signature] Via: 10/23/20 1315 Date Time

Date: 10/24/20 Time: 1900 Relinquished by: [Signature] Received by: [Signature] Via: courier Date Time: 10/24/20 8:45

Remarks: Send WQ # 20836252 to Natalie Gordon Bill Duven

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

# Chain-of-Custody Record

Client: Devon

Mailing Address: on file

Phone #:

email or Fax#:

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

Accreditation:  Az Compliance  
 NELAC  Other  
 EDD (Type)

Turn-Around Time: 5 Day Turn  
 Standard  Rush

Project Name: Thistle Unit OHS

Project #: 20E-00141-066

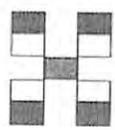
Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice:  Yes  No

# of Coolers: 1

Cooler Temp (including CF): 3.1 + 0.1 = 3.2 (°C)



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

### Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX	MTBE / TMBE (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	CF, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/23/20		Soil	BS20-13 2'	4oz jar	ICE	2010B65 -013	X	X						X			
			BS20-14 2'			-014											
			BS20-15 2'			-015											
			BS20-16 2'			-016											
			BS20-17 2'			-017											
			BS20-18 2'			-018											
			BS20-19 2'			-019											
			BS20-20 2'			-020											
			BS20-21 2'			-021											
			BS20-22 2'			-022											
			BS20-23 2'			-023											
			BS20-24 2'			-024											

Date: 10/23/20 Time: 1:57p Relinquished by: Kevin Smith Received by: [Signature] Via:  Date: 10/23/20 Time: 1:30p Remarks: Send to Natalie Gordon

Date: 10/23/20 Time: 1:40p Relinquished by: [Signature] Received by: [Signature] Via: courier Date: 10/24/20 Time: 8:45

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

# Chain-of-Custody Record

Turn-Around Time: 5 Day Turn

Client: Devo-

Standard  Rush

Mailing Address: on file

Project Name: Thistle Unit 048

Project #: 20E-00141-066

Project Manager: Natalie Gordon

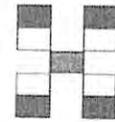
Sampler: Kevin Smith

On Ice:  Yes  No

# of Coolers: 1

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

Accreditation:  Az Compliance  
 NELAC  Other  
 EDD (Type)



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

### Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MIRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/23/20		Soil	WS20-01 0-1'	4oz jar	ICE	2010B65-025	X	X					X			
			WS20-02 0-1'			-026										
			WS20-03 0-1'			-027										
			WS20-04 0-2'			-028										
			WS20-05 0-2'			-029										
			WS20-06 0-2'			-030										
			WS20-07 0-2'			-031										
			WS20-08 0-2'			-032										

Date: 10/23/20 Time: 1:15 Relinquished by: Kevin Smith Received by: [Signature] Via: [Signature] Date: 10/23/20 Time: 1315

Date: 10/23/20 Time: 1900 Relinquished by: [Signature] Received by: [Signature] Via: courier Date: 10/24/20 Time: 8:45

Remarks: Sand to Natalie Gordon

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

**District I**  
 1625 N. French Dr., Hobbs, NM 88240  
 Phone:(575) 393-6161 Fax:(575) 393-0720

**District II**  
 811 S. First St., Artesia, NM 88210  
 Phone:(575) 748-1283 Fax:(575) 748-9720

**District III**  
 1000 Rio Brazos Rd., Aztec, NM 87410  
 Phone:(505) 334-6178 Fax:(505) 334-6170

**District IV**  
 1220 S. St Francis Dr., Santa Fe, NM 87505  
 Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS

Action 11326

**CONDITIONS OF APPROVAL**

Operator:	OGRID:	Action Number:	Action Type:
DEVON ENERGY PRODUCTION COMPAN	6137	11326	C-141
333 West Sheridan Ave.	Oklahoma City, OK73102		

OCD Reviewer	Condition
ceads	None