Volume calculator

There was no volume calculator prepared when the spill occurred.

August 5, 2021 Vertex Project #: 21E-02816-03

Spill Closure Report: Blackjack 1 Federal #2
Unit J, Section 1, Township 24 South, Range 30 East
County: Eddy
API: 30-015-33383
Tracking Number: NAB1721929878 (2RP-4319)

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

New Mexico Oil Conservation Division – District 2 – Artesia
811 South 1st Street
Artesia, New Mexico 88210

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a produced water and oil release that occurred on July 16, 2017, north of the engineered pad due to a polyline failure associated with Blackjack 1 Federal #2, API 30-015-33383 (hereafter referred to as "Blackjack"). Devon provided notification of the spill to New Mexico Oil Conservation Division (NMOCD) District 2, and the Bureau of Land Management (BLM), who owns the property, on July 16, 2017, via an initial C-141 Release Notification (Attachment 1). The NMOCD tracking number assigned to this incident is NAB1721929878 (2RP-4319).

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 a final report to obtain approval from NMOCD for closure of this release.

Incident Description

On July 16, 2017, a release occurred to the north of the engineered pad when a polyline associated with Devon's Blackjack failed at a fused section, causing produced water and oil to be released. This incident resulted in the release of approximately 7 barrels (bbls) of produced water and 1 bbls of oil into the pasture area north of the engineered pad. Upon discovery of the release, the well at Blackjack was shut in to prevent any additional fluid from being released. A total of ½ bbls of oil and 5 bbls of produced water were recovered via vacuum truck dispatched to the release location. The release was contained, and no produced water or oil was released into sensitive areas or waterways.

Site Characterization

The release at Blackjack occurred on federally-owned land, N 32.2451248, W 103.8320541, approximately 14 miles east of Malaga, New Mexico. The legal description for the site is Unit J, Section 1, Township 24 South, Range 30 East, Eddy 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 presented on Figure 1 (Attachment 2).

The surrounding landscape is associated with fan piedmonts and plains at elevations of 2,000 to 5,700 feet above sea level. The climate is semi-arid, with average annual precipitation ranging between 5 and 15 inches. Historically, the plant community has been predominantly black grama, dropseed, and warm season mid grasses with scattered shrubs, such as mesquite and creosote brush (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted well pad.

The Geological Map of New Mexico indicates the surface geology at Blackjack is comprised primarily of Qep – interlayed eolian sands and piedmont-slope deposits from the Holocene to middle Pleistocene ages (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service Web Soil Survey characterizes the soil at the site as Berino complex and Tonuco loamy fine sand, characterized by sandy and loamy sand. It tends to be well-drained with runoff ranging from low to very low with moderate available moisture levels 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 Blackjack (United States Department of the Interior, Bureau of Land Management, 2020).

There is no surface water located at Blackjack. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is the Pecos River located approximately 9 miles southwest of Blackjack (United States Fish and Wildlife Service, 2020). There are no continuously flowing 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 active well to Blackjack is a United States Geological Survey-identified well from 2022 located approximately 0.58 miles to the north, C-04646 POD 1 was installed to a depth of 110 feet bgs. Groundwater was not encountered. There are no active wells within a 0.5 mile radius of the site. 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 was subject to any of the special case scenarios outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The depth to groundwater reference exceeded 0.5 miles from the release area and the depth measurement was made more than 25 years ago; therefore, the closure criteria for remediation and reclamation of the site was determined to be associated with the strictest constituent concentration limits as presented in Table 1.

Table 1. Closure Criteria for Soils Impacted by a Release		
Depth to Groundwater	**Constituent**	**Limit**
< 50 feet	Chloride	600 mg/kg
	TPH[1] (GRO + DRO + MRO)	100 mg/kg
	BTEX[2]	50 mg/kg
	Benzene	10 mg/kg

[1]Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)

[2]Benzene, toluene, ethylbenzene and xylenes (BTEX)

Remedial Actions

Vertex completed the initial spill inspection on April 27, 2020, and identified and mapped the boundaries of the potential release area. The release area was determined to be approximately 70 feet long and 54 feet wide; the total affected area was determined to be approximately 2,960 square feet (Attachment 2 – Figure 1). A total of seven samples were collected throughout the area to determine the horizontal and vertical extents of the release.

On October 27, 2020, Vertex provided 48-hour notification of confirmation sampling to NMOCD and the BLM, as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC (Attachment 4). Vertex was on-site at Blackjack on October 28 and 29, 2020 guiding the excavation of impacted soils. The Daily Field Report (DFR) associated with the site visit(s) are included in Attachment 5. Vertex collected a total of 27 five-point composite confirmatory samples from the area on October 29, 2020. Confirmatory sample locations are presented on Figure 2 (Attachment 2). Total depth of excavation was 3 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 NMOCD approval. The composite 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. Characterization sample field screen and analytical data, and final confirmatory sample analytical data are summarized in Tables 2 and 3, respectively (Attachment 6). Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit, or equivalent, was used to map the approximate center of each of the five-point composite samples.

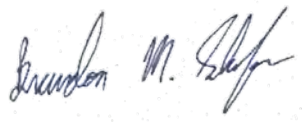
Closure Request

Vertex recommends no additional remediation action to address the release at Blackjack. Laboratory analyses of the confirmatory samples showed constituent of concern concentration levels below NMOCD Closure Criteria for areas where depth to groundwater is less than 50 feet bgs as presented in Table 1. 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 (NAB1721929878 [2RP-4319]) 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 NMOCD requirements to obtain closure on the July 16, 2017, release at Blackjack.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 832.588.0674 or dhanton@vertex.ca.



August 5, 2021

Brandon Schafer, B.Sc. Date
PROJECT MANAGER, REPORTING

August 5, 2021

Dhugal Hanton, B.Sc., P.Ag., P.Biol., SR/WA Date
VICE PRESIDENT – USA,, REPORT REVIEW

Attachments

References

New Mexico Bureau of Geology and Mineral Resources. (2020). *Interactive Geologic Map.* Retrieved from http://geoinfo.nmt.edu

New Mexico Oil Conservation Division. (2018). *New Mexico Administrative Code – Natural Resources and Wildlife Oil and Gas Releases.* Santa Fe, New Mexico.

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

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). *Groundwater for New Mexico: Water Levels.* Retrieved from https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?

United States Fish and Wildlife Service. (2020). *National Wetlands Inventory*. Retrieved from https://www.fws.gov/wetlands/Data/Mapper.html

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

NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 28 2017
RECEIVED

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

nAB1721929878

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Devon Energy Production Company 6137	**Contact** Wesley Ryan- Production Foreman
Address 6488 Seven Rivers Hwy Artesia, NM 88210	**Telephone No.** 575-390-5436
Facility Name Blackjack 1 Federal #2	**Facility Type** Oil

Surface Owner Federal	**Mineral Owner** Federal	**API No** 30-015-33383

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	01	24S	30E	1980	South	1980	East	Eddy

Latitude: 32.2451248 **Longitude:** -103.8320541

NATURE OF RELEASE

Type of Release Oil & Produced Water	**Volume of Release** 1 BBL Oil & 7 BBL Produced Water	**Volume Recovered** 1/2 BBL Oil & 5 BBL Produced Water
Source of Release Poly Flow Line	**Date and Hour of Occurrence** July 16, 2017 10:15	**Date and Hour of Discovery** July 16, 2017 10:15
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	**If YES, To Whom?** BLM- Shelly Tucker & OCD-Mike Bratcher	
By Whom? Harry Linam-Assistant Production Foreman	**Date and Hour** BLM: July 16, 2017 10:20 AM OCD July 16, 2017 10:30 AM	
Was a Watercourse Reached? ☐ Yes ☒ No	**If YES, Volume Impacting the Watercourse** N/A	

If a Watercourse was Impacted, Describe Fully.*
N/A

Describe Cause of Problem and Remedial Action Taken.*
Polyline failed at a fused section resulting in the release. The well was shut in to prevent any further release. The polyline has been repaired.

Describe Area Affected and Cleanup Action Taken.*
1 BBL of Oil & 7 BBL of Produced Water was released. A vacuum truck was dispatched and 1/2 BBL of Oil & 5 BBL of Produced Water was recovered. The release originated from the poly flow line that is located off the well pad on the North side. An area approximately 25ft X 15FT off well pad was affected by the release. An environmental contractor will be contacted to assist with the delineation and remediation.

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

Signature: Jennifer Reyna	OIL CONSERVATION DIVISION	
Printed Name:	Approved by Environmental Specialist:	
Title: **Field Admin Support**	Approval Date: 8/7/17	Expiration Date: N/A
E-mail Address: **jennifer.reyna@dvn.com**	Conditions of Approval: see attached	Attached ☒
Date: Phone: **575.746.5588**		

* Attach Additional Sheets If Necessary

2RP-4319

8/31/17

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	nAB1721929878
District RP	2RP-4319
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party **Harvard Petroleum Company, LLC**	OGRID **10155**
Contact Name **Jeff Harvard**	Contact Telephone **575-208-7135**
Contact email **jharvard@hpcnm.com**	Incident # **nAB1721929878**
Contact mailing address **P.O. Box 936 Roswell, NM 88202**	

Location of Release Source

Latitude **32.245588** Longitude **-103.831719**
(NAD 83 in decimal degrees to 5 decimal places)

Site Name **Blackjack 1 Federal #002**	Site Type **Oil**
Date Release Discovered **July 16, 2017**	API# **30-015-33383**

Unit Letter	Section	Township	Range	County
J	**01**	**24S**	**30E**	**Eddy**

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)

☒ Crude Oil	Volume Released (bbls) **1**	Volume Recovered (bbls) **0.5**
☒ Produced Water	Volume Released (bbls) **7**	Volume Recovered (bbls) **5**
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

2RP-4319 C-141 received 7/28/2017 for release 7/16/2017. Cause listed as, "Polyline failed at a fused section resulting in the release. The well was shut in to prevent any further release. The polyline has been repaired." The area affected listed as, "1 BBL of Oil & 7 BBL of Produced Water was released. A vacuum truck was dispatched and ½ BBL of Oil & 5 BBL of Produced Water was recovered. The release originated from the poly flow line that is located off the well pad on the North side. An area approximately 25ft x 15ft off well pad was affected by the release. An environmental contractor will be contacted to assist with the delineation and remediation. "

State of New Mexico
Oil Conservation Division

Incident ID	nAB1721929878
District RP	2RP-4319
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Notice was given but not required. Harry Linam Shelly Tucker at the BLM and Mike Bratcher at OCD were called on July 16, 2017 at 10:20 and 10:30, respectively.

Initial Response

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

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ 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: Jeff Harvard Title: President and Manager

Signature: _____ Date: _____

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: _____ Date: _____

Incident ID	nAB1721929878
District RP	2RP-4319
Facility ID	
Application ID	

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?	<u>≤100</u> (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ 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)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ 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?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ 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.

<u>Characterization Report Checklist</u>: *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.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nAB1721929878
District RP	2RP-4319
Facility ID	
Application ID	

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: Jeff Harvard Title: President and Manager

Signature: Date:

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: Date:

Incident ID	nAB1721929878
District RP	2RP-4319
Facility ID	
Application ID	

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: Jeff Harvard Title: President and Manager

Signature: _____ Date: _____

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: _____ Date: _____

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: _____ Date: _____

Printed Name: _____ Title: _____

ATTACHMENT 2

Borehole
Point of Release
Surface Sample
Flow Line
Approximate Spill Extent (~ 2960 sq.ft.)

VERTEX

0 5 10 20 ft

Map Center:
Lat/Long: 32.245629, -103.831655

NAD 1983 UTM Zone 13N
Date: May 04/20

N

Site Schematic and Characterization Sampling Locations
Blackjack 1 Federal #2

FIGURE:
1

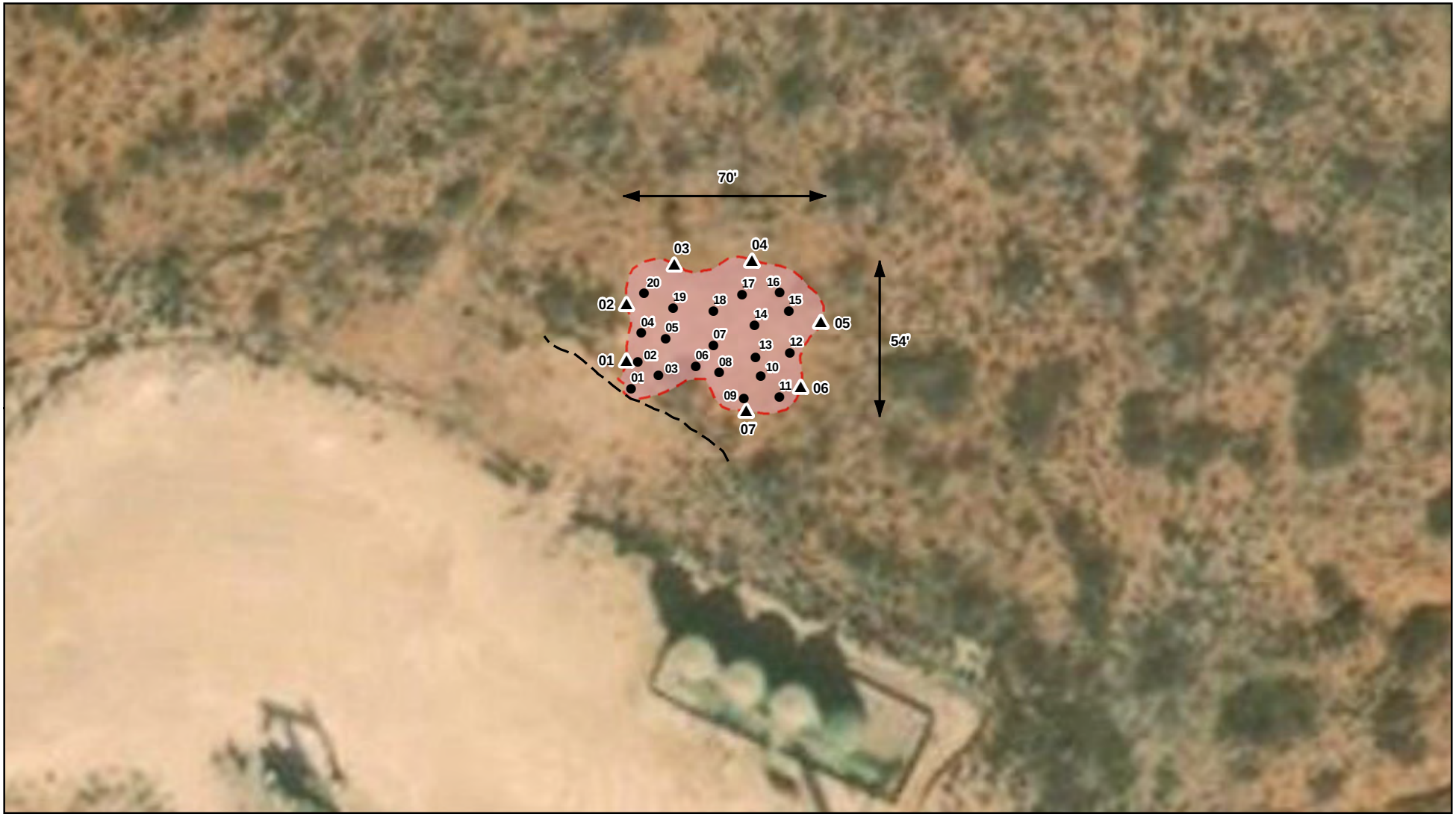
devon

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 ESRI, 2018.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-00141\045 - Blackjack 1 Fed #2\Figure 1 Initial Characterization Blackjack 1 Fed #2.mxd



● Base Sample (Prefixed by "BS20-")

▲ Wall Sample (Prefixed by "WS20-")

Flow Line

Approximate Spill Extent (~ 2960 sq.ft.)

VERTEX

0 12.5 25 50 ft

Map Center:
Lat/Long: 32.245548, -103.831647

NAD 1983 UTM Zone 13N

Date: Nov 12/20

N

Final Confirmatory Sampling Locations
Blackjack 1 Federal #2

FIGURE:
2

devon

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 ESRI, 2018.

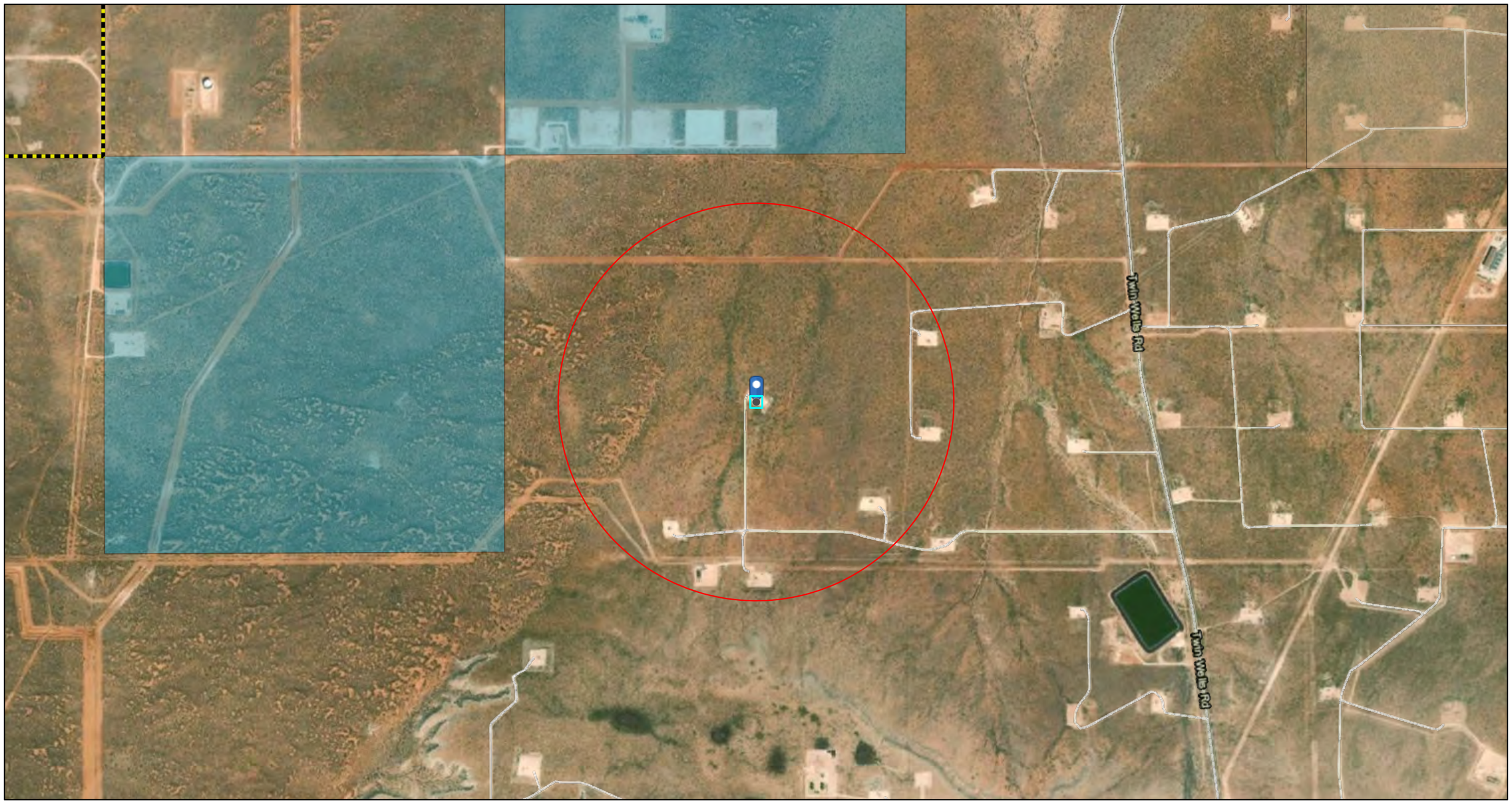
VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-00141\045 - Blackjack 1 Fed #2\Figure 2 Confirmatory Schematic Blackjack 1 Fed #2.mxd

ATTACHMENT 3

Closure Criteria Determination Worksheet				
Site Name: Blackjack 1 Fed #2				
Spill Coordinates:		X: 32.24510	Y: -103.83210	
Site Specific Conditions		Value	Unit	Reference
1	Depth to Groundwater (Nearest Well)	**367**	feet	1
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	47840	feet	2
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	20899	feet	3
4	Within 300 feet from an occupied residence, school, hospital, institution or church	11842	feet	4
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, **or**	12782	feet	5
	ii) Within 1000 feet of any fresh water well or spring	12782	feet	5
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)	6
7	Within 300 feet of a wetland	4095	feet	7
8	Within the area overlying a subsurface mine	No	(Y/N)	8
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low	9
10	Within a 100-year Floodplain	Minimal Flood Hazard	year	10
11	Soil Type	Berino complex and Tonuco loamy fine sand		11
12	Ecological Classification	Sandy Loamy sand		12
13	Geology	Qep		13
NMAC 19.15.29.12 E (Table 1) Closure Criteria		<50'	<50' 51-100' >100'	

Blackjack 1 Federal #2



3/2/2021, 2:34:26 PM

OSE District Boundary

New Mexico State Trust Lands

Subsurface Estate

Both Estates

SiteBoundaries

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

USDA FSA, GeoEye, Maxar, Esri, HERE, iPC, U.S. Department of Energy Office of Legacy Management, Esri, HERE, Garmin, iPC

OSE POD Locations

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 321334103494901

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

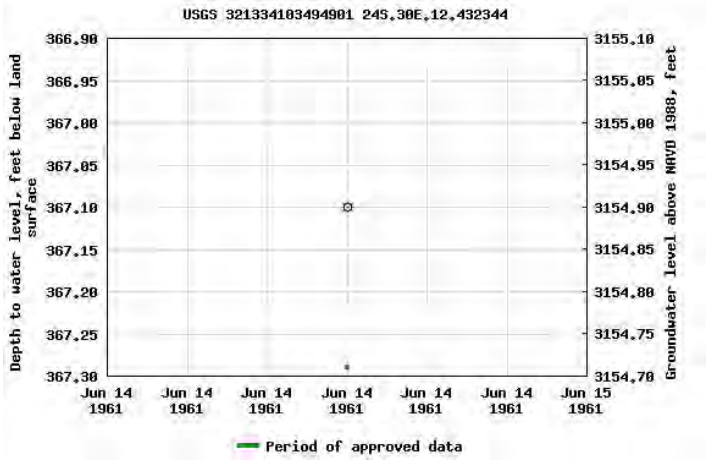
USGS 321334103494901 24S.30E.12.432344

Available data for this site | Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°13'34", Longitude 103°49'49" NAD27
Land-surface elevation 3,522 feet above NAVD88
The depth of the well is 500 feet below land surface.
This well is completed in the Rustler Formation (312RSLR) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

U.S. Department of the Interior | U.S. Geological Survey
Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2020-10-19 13:56:55 EDT
0.63 0.56 nadww01

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

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- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 321526103520101

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

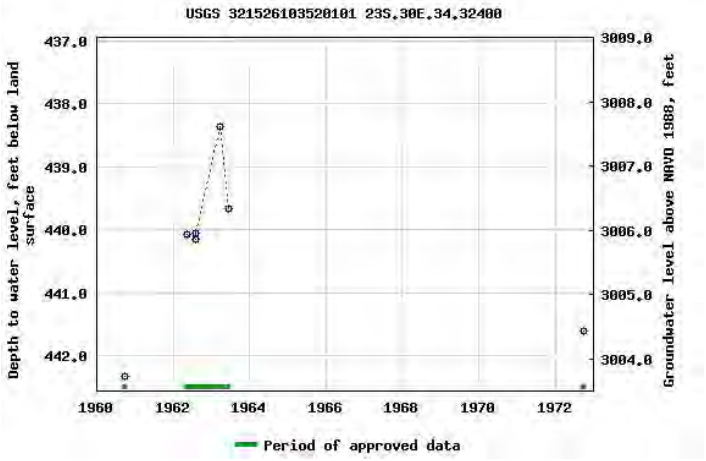
USGS 321526103520101 23S.30E.34.32400

Available data for this site | Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°15'26", Longitude 103°52'01" NAD27
Land-surface elevation 3,446 feet above NAVD88
The depth of the well is 567 feet below land surface.
This well is completed in the Rustler Formation (312RSLR) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
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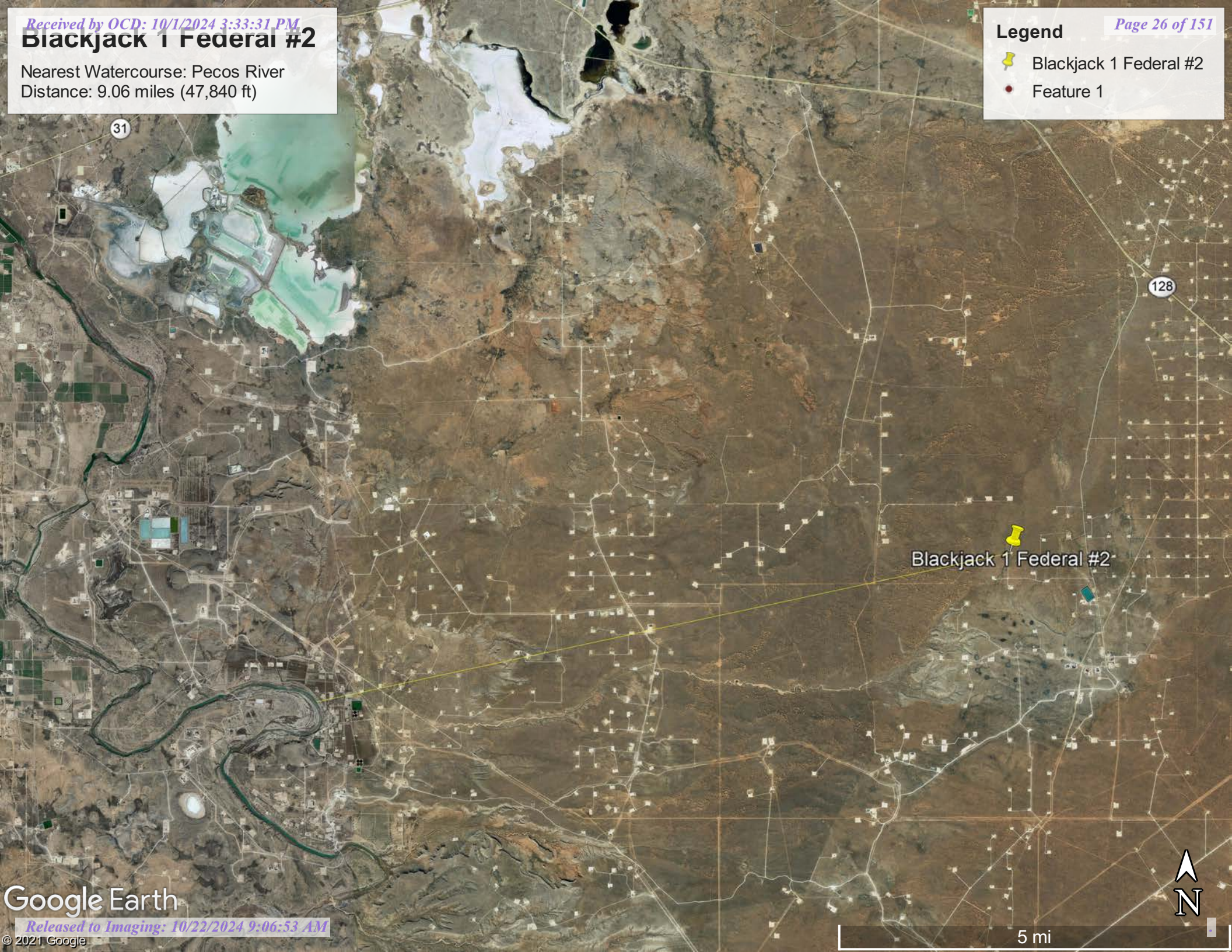
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

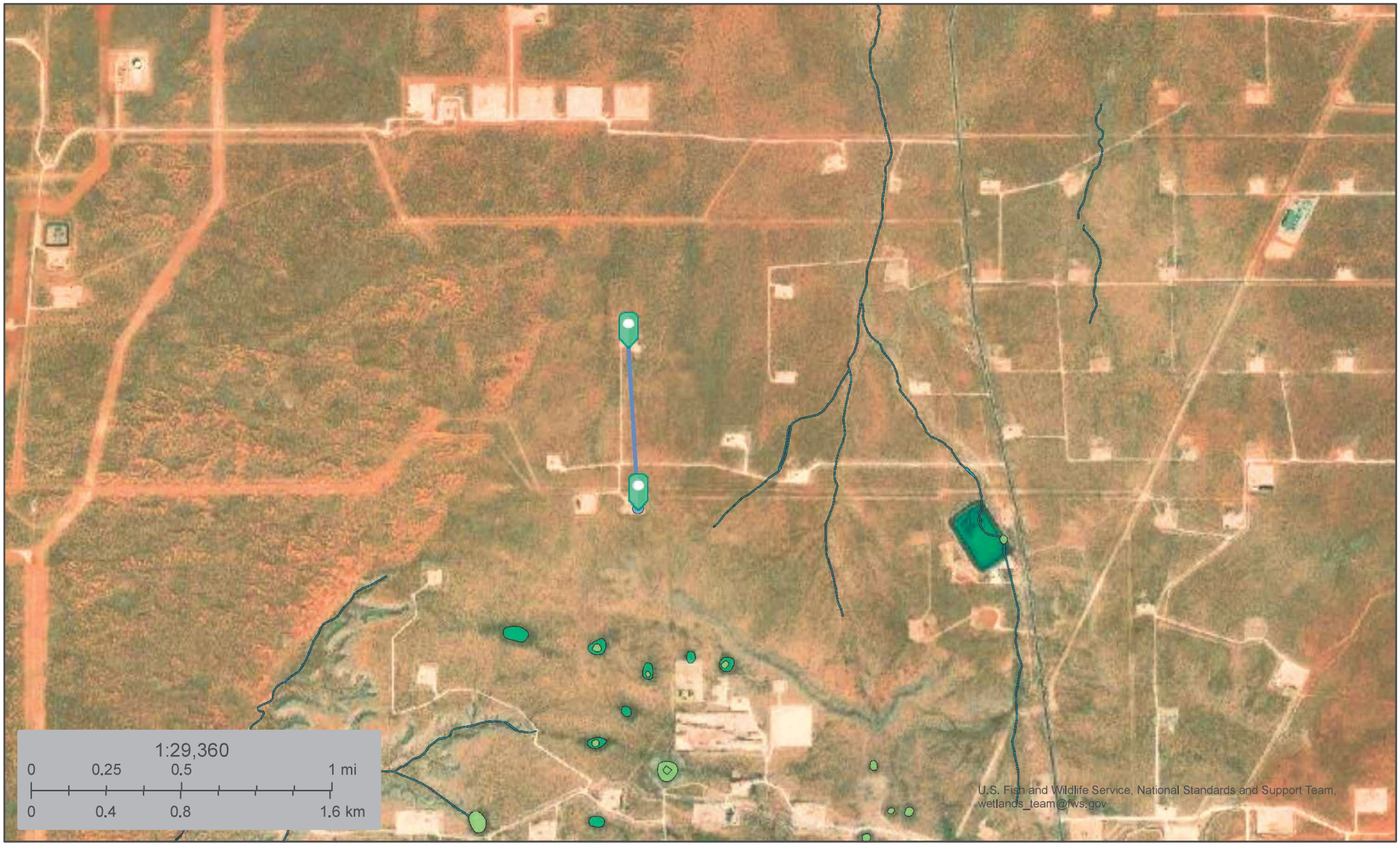
Blackjack 1 Federal #2

Nearest Watercourse: Pecos River
Distance: 9.06 miles (47,840 ft)



U.S. Fish and Wildlife Service
National Wetlands Inventory

Blackjack 1 Fed 2 - Pond 2,429 ft



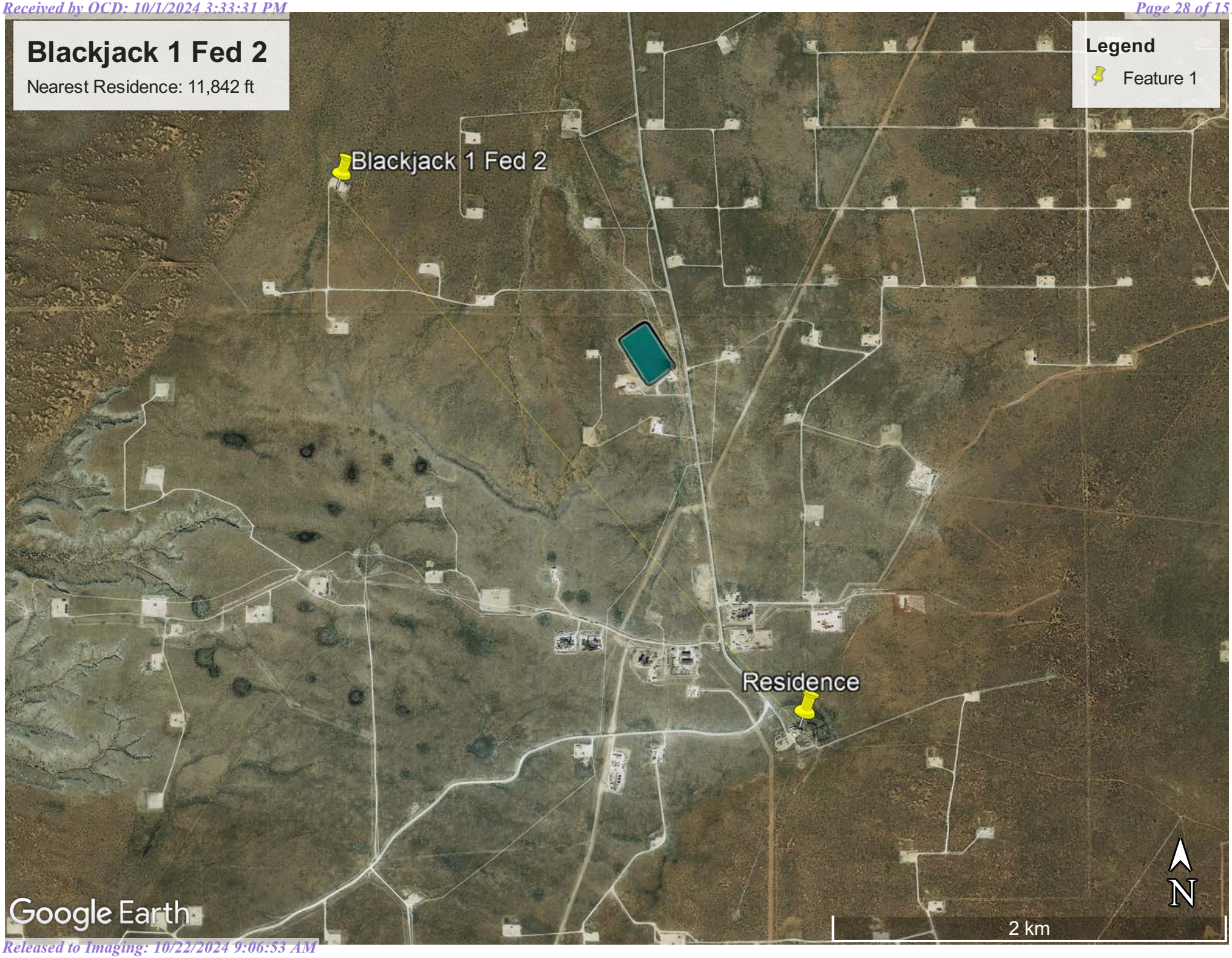
February 9, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub 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 Wetlands Inventory (NWI)
This page was produced by the NWI mapper


Blackjack 1 Fed 2
Nearest Residence: 11,842 ft
Legend
Feature 1
Blackjack 1 Fed 2
Residence
N
2 km
Google Earth

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

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 03908 POD1	CUB	ED	3	4	3	34	23S	30E	606331	3569300	3852	760		
C 02783	CUB	ED	3	3	1	04	24S	31E	613911	3568461	3896	708		
C 02783 POD2	CUB	ED	3	3	1	04	24S	31E	613911	3568461	3896	672		
C 02784	C	ED	4	2	4	04	24S	31E	613911	3568461	3896	584		
C 03908 POD4	CUB	ED	3	2	1	34	23S	30E	606333	3569605	3948	1137		
C 02661	CUB	ED	3	3	1	04	24S	31E	613969	3568485*	3955	708		
C 02785	CUB	ED	3	3	1	04	24S	31E	613969	3568485*	3955	692		
C 02095	CUB	ED		2	3	34	23S	30E	606337	3569759*	4001	554	440	114
C 03908 POD2	CUB	ED	3	1	3	34	23S	30E	605872	3569594	4378	518		
C 03908 POD3	CUB	ED	3	1	3	34	23S	30E	605851	3569640	4413	463		
C 02780	CUB	ED	2	3	2	23	24S	30E	608535	3563857*	4592	505		
C 02781	CUB	ED	4	3	2	23	24S	30E	608535	3563657*	4782	624		
C 02782	CUB	ED	4	3	2	23	24S	30E	608535	3563657*	4782	808		
C 03702 POD1	CUB	ED	4	1	4	24	24S	30E	610092	3563204	4998	20		

Average Depth to Water: **440 feet**

Minimum Depth: **440 feet**

Maximum Depth: **440 feet**

Record Count: 14

UTMNAD83 Radius Search (in meters):

Easting (X): 610023.23 **Northing (Y):** 3568202 **Radius:** 5000

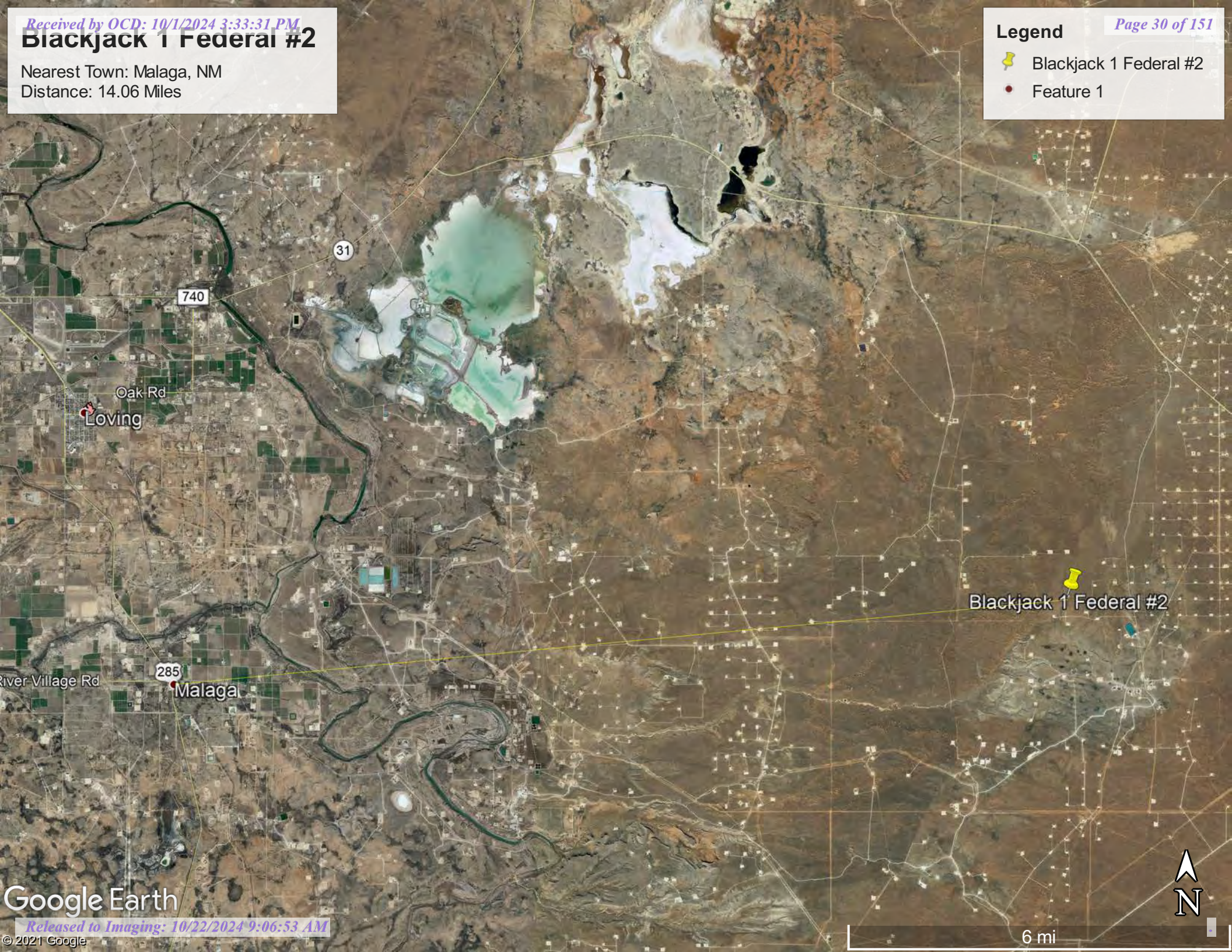
***UTM location was derived from PLSS - see Help**

Blackjack 1 Federal #2

Nearest Town: Malaga, NM
Distance: 14.06 Miles

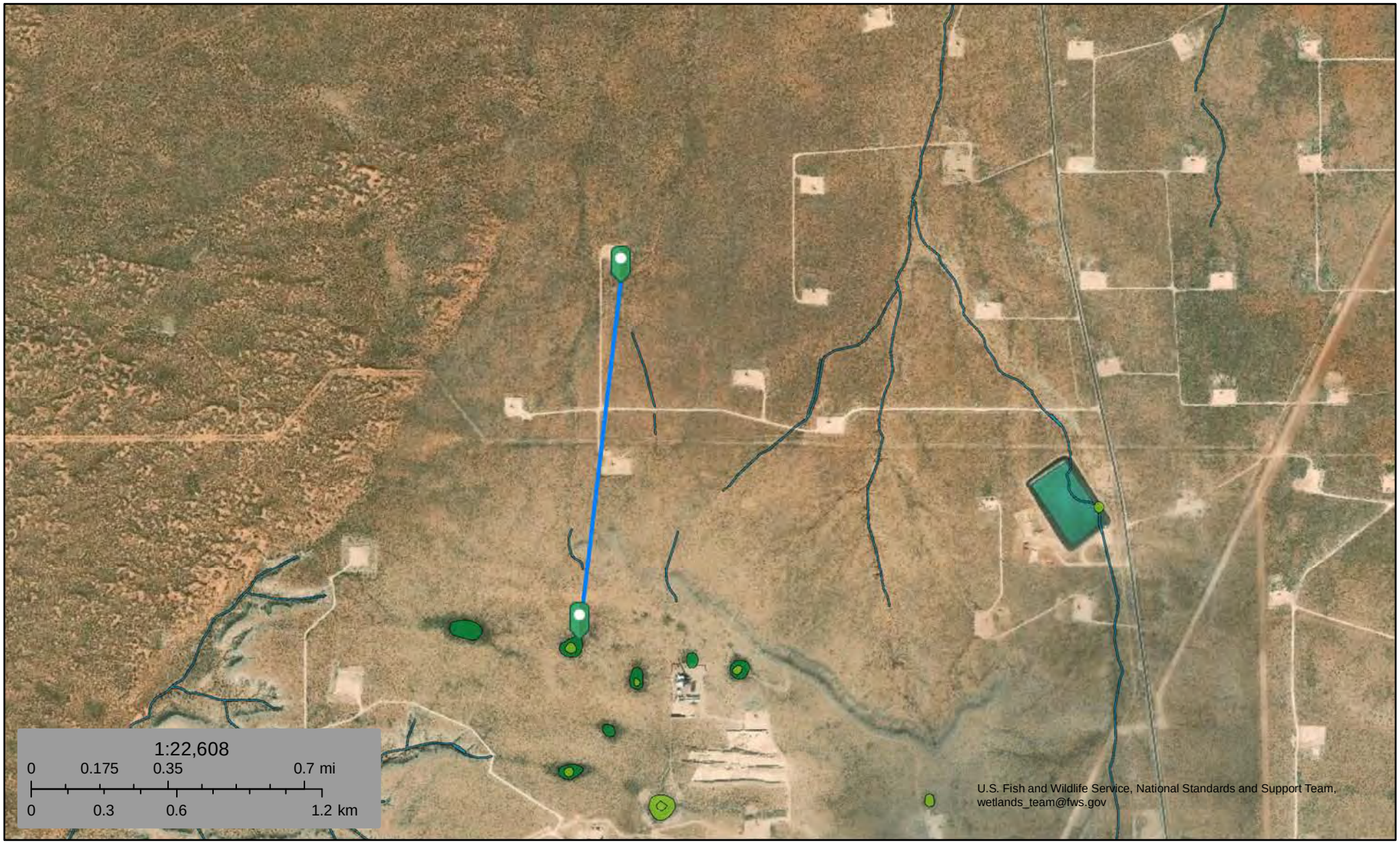
Legend

- Blackjack 1 Federal #2
- Feature 1



U.S. Fish and Wildlife Service
National Wetlands Inventory

Blackjack 1 Fed 2: Wetland 4,095 ft



April 3, 2020

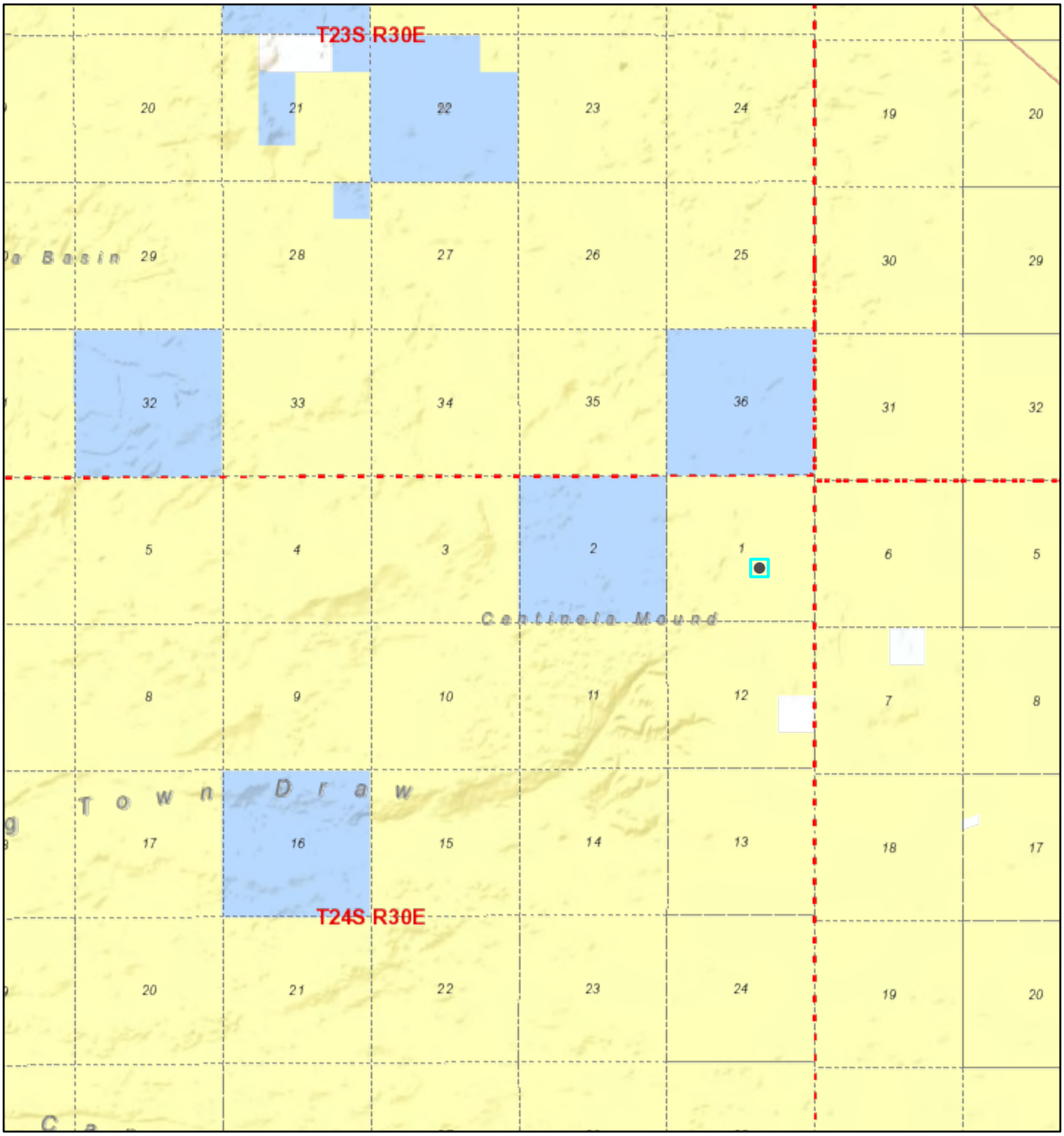
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub 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 Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Active Mines near Blackjack 1 Fed 2



4/3/2020, 8:54:10 AM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

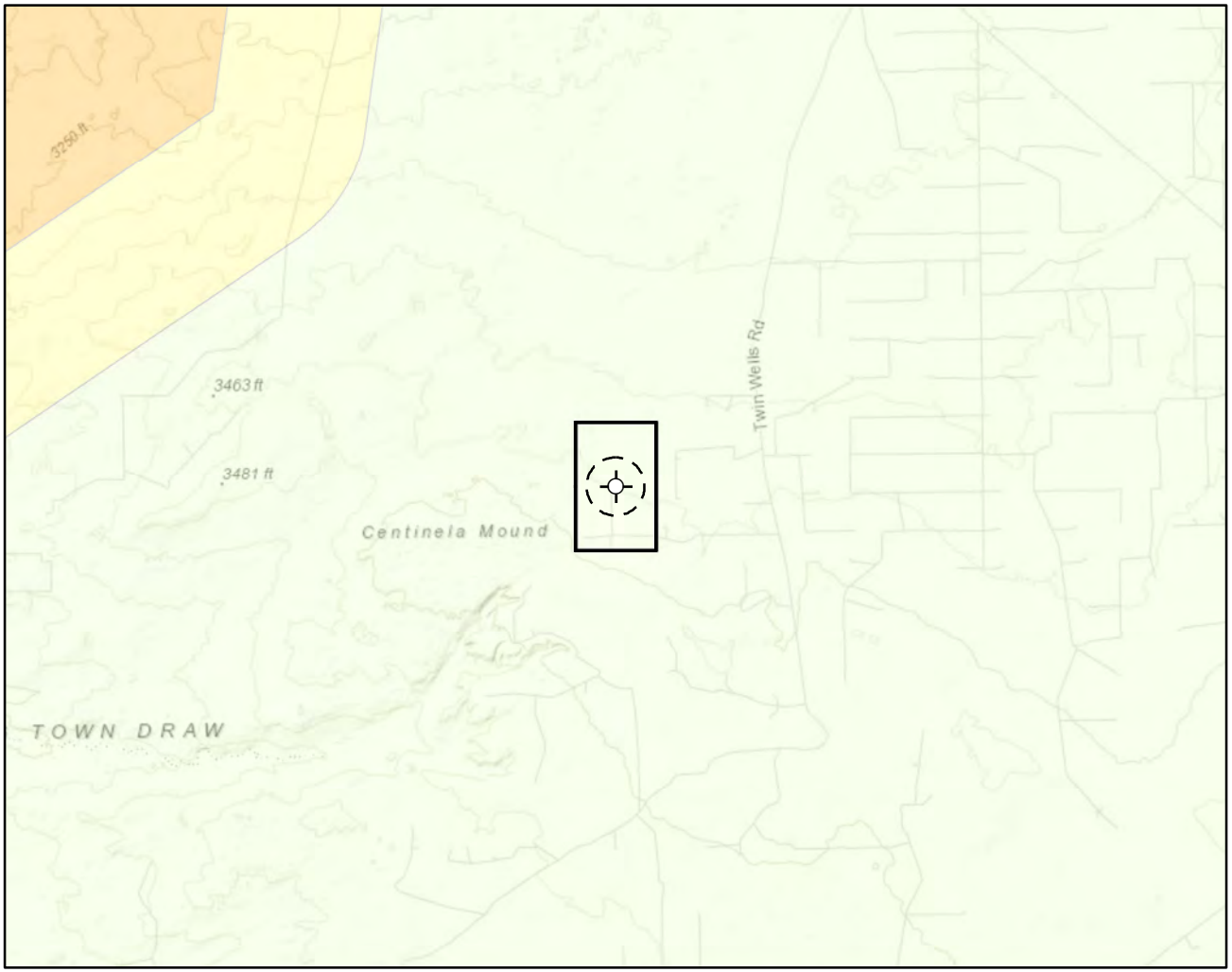
Registered Mines

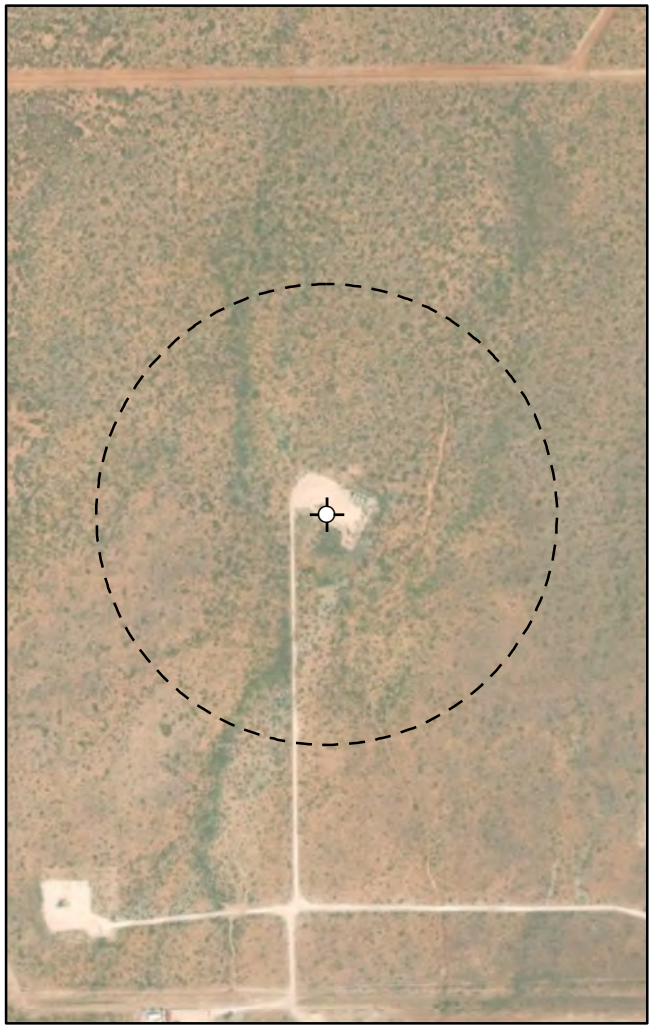
Aggregate, Stone etc.

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

EMNRD MMD GIS Coordinator

New Mexico Energy, Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=1b5e577974664d689b47790897ca2795)





Karst Potential

- Critical
- High
- Medium
- Low

Site

Site Buffer (1,000 ft.)

Overview Map

0 0.25 0.5 1 mi

Detail Map

0 150 300 600 ft.

VERTEX

Map Center:
Lat/Long: 32.245107, -103.832039

NAD 1983 UTM Zone 13N
Date: Mar 05/21

N

Karst Potential Map
Blackjack 1 Federal #2

FIGURE:
X

devon

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 2019; Overview Map - ESRI World Topographic

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-001411\045 - Blackjack 1 Fed #2\FigX Karst Potential Map Blackjack 1 Fed #2.mxd

National Flood Hazard Layer FIRMette

FEMA

32°14'57.57"N

103°50'14.29"W

103°49'36.83"W

32°14'27.15"N

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

1:6,000

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *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
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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 4/3/2020 at 10:34:53 AM 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.

Soil Map—Eddy Area, New Mexico
(Blackjack 1 Fed 2)

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: Eddy Area, New Mexico
Survey Area Data: Version 15, 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
BB	Berino complex, 0 to 3 percent slopes, eroded	1.0	60.1%
TF	Tonuco loamy fine sand, 0 to 3 percent slopes	0.7	39.9%
Totals for Area of Interest		**1.7**	**100.0%**

Eddy Area, New Mexico

BB—Berino complex, 0 to 3 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w43
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 5 to 15 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Berino and similar soils: 60 percent
Pajarito and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berino

Setting

Landform: Fan piedmonts, plains
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 17 inches: fine sand
H2 - 17 to 58 inches: sandy clay loam
H3 - 58 to 60 inches: loamy sand

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
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Description of Pajarito

Setting

Landform: Interdunes, plains, dunes
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 72 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Minor Components

Cacique

Percent of map unit: 4 percent
Ecological site: Sandy (R042XC004NM)
Hydric soil rating: No

Wink

Percent of map unit: 4 percent
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Pajarito

Percent of map unit: 4 percent
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Kermit

Percent of map unit: 3 percent
Ecological site: Deep Sand (R042XC005NM)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 15, Sep 15, 2019

Eddy Area, New Mexico

TF—Tonuco loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w61
Elevation: 3,000 to 4,100 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 217 days
Farmland classification: Not prime farmland

Map Unit Composition

Tonuco and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tonuco

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 5 inches: loamy fine sand
H2 - 5 to 15 inches: loamy fine sand
H3 - 15 to 19 inches: indurated

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 6 to 20 inches to petrocalcic
Natural drainage class: Excessively drained
Runoff class: Very 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
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Sandy (R042XC004NM)
Hydric soil rating: No

Minor Components

Tonuco
Percent of map unit: 1 percent
Ecological site: Sandy (R042XC004NM)
Hydric soil rating: No

Dune land
Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 15, Sep 15, 2019

USDA Natural Resources Conservation Service

Ecological site R042XC003NM
Loamy Sand

Accessed: 07/29/2021

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R042XC004NM	**Sandy** Sandy
R042XC005NM	**Deep Sand** Deep Sand

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is on uplands, plains, dunes, fan piedmonts and in inter dunal areas. The parent material consists of mixed alluvium and or eolian sands derived from sedimentary rock. Slope range on this site range from 0 to 9 percent with the average of 5 percent.

Low stabilized dunes may occur occasionally on this site. Elevations range from 2,800 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Dune
Elevation	2,800–5,000 ft
Slope	0–9%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity-short duration thunderstorms.
Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.
The average frost-free season is 207 to 220 days. The last killing frost being late March or early April and the first killing frost being in later October or early November.
Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest from January through June, which accelerates soil drying during a critical period for cool season plant growth.

Climate data was obtained from http://www.wrcc.sage.dri.edu/summary/climsmnm.html web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

Table 3. Representative climatic features

Frost-free period (average)	221 days
Freeze-free period (average)	240 days
Precipitation total (average)	13 in

Influencing water features

This site is not influenced from water from wetlands or streams.

Soil features

Soils are moderately deep or very deep. Surface textures are loamy fine sand, fine sandy loam, loamy very fine sand or gravelly sandy loam.

Subsurface is a loamy fine sand, coarse sandy loam, fine sandy loam or loam that averages less than 18 percent clay and less than 15 percent carbonates.

Substratum is a fine sandy loam or gravelly fine sandy loam with less than 15 percent gravel and with less than 40 percent calcium carbonate. Some layers high in lime or with caliche fragments may occur at depths of 20 to 30 inches.

These soils, if unprotected by plant cover and organic residue, become wind blown and low hummocks are formed.

Minimum and maximum values listed below represent the characteristic soils for this site.

Characteristic soils are:

Maljamar
Berino
Parjarito
Palomas
Wink
Pyote

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Fine sandy loam (3) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	40–72 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–7 in
Calcium carbonate equivalent (0-40in)	3–40%
Electrical conductivity (0-40in)	2–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	4–12%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Overview

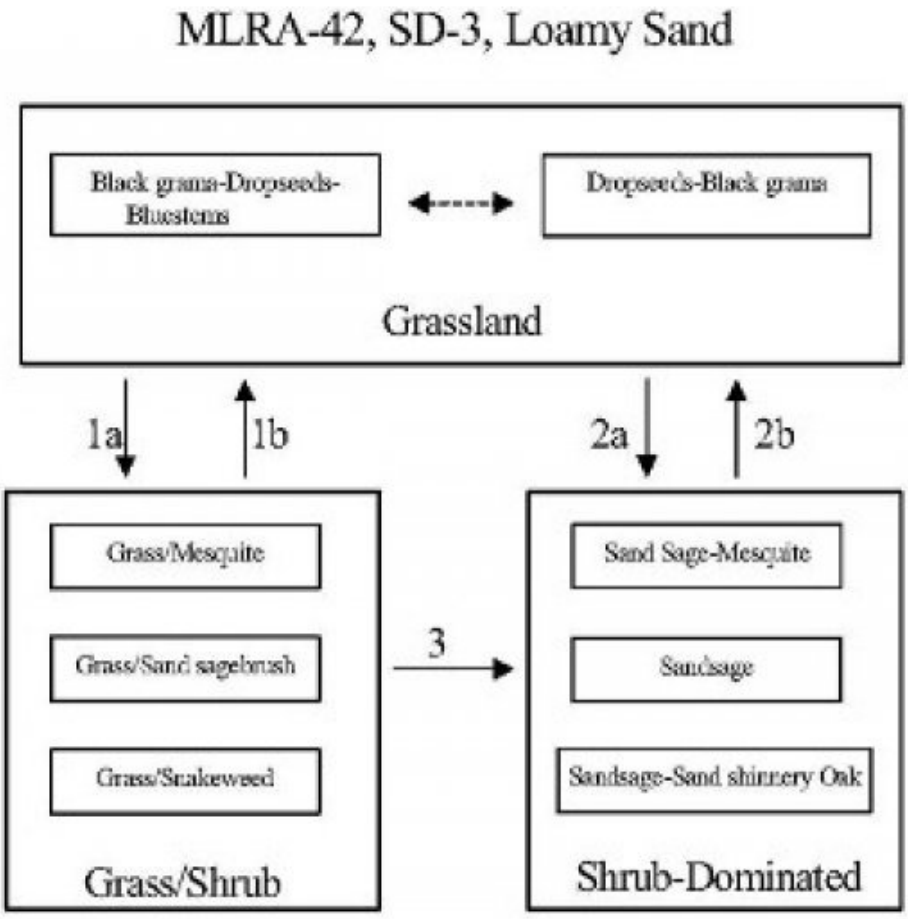
The Loamy Sand site intergrades with the Deep Sand and Sandy sites (SD-3). These sites can be differentiated by surface soil texture and depth to a textural change. Loamy Sand and Deep Sand sites have coarse textured (sands and loamy sand) surface soils while Sandy sites have moderately coarse textured (sandy loam and fine sandy loam) surfaces. Although Loamy Sand and Deep Sand sites have similar surface textures, the depth to a textural change is different—Loamy Sand sub-surface textures typically increase in clay at approximately 20 to 30 inches, and Deep Sand sites not until around 40 inches.

The historic plant community of Loamy Sand sites is dominated by black grama (*Bouteloua eriopoda*), dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*), and bluestems (*Schizachyrium scoparium* and *Andropogon hallii*), with scattered shinnery oak (*Quercus havardii*) and sand sage (*Artemisia filifolia*). Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and to a lesser extent, bare ground, are a significant proportion of ground cover while grasses compose the remainder. Decreases in black grama indicate a transition to either a grass/shrub or shrub-dominated state. The grass/shrub state is composed of grasses/honey mesquite (*Prosopis glandulosa*), grasses/broom snakeweed (*Gutierrezia sarothrae*), or grasses/sand sage. The shrub-dominated state occurs after a severe loss of grass cover and a prevalence of sand sage with secondary shinnery oak and mesquite. Heavy grazing intensity and/or drought are influential drivers in decreasing black grama and bluestems and subsequently increasing shrub cover, erosion, and bare patches. Historical fire suppression also

encourages shrub pervasiveness and a competitive advantage over grass species (McPherson 1995). Brush and grazing management, however, may reverse grass/shrub and shrub-dominated states toward the grassland-dominated historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram):



1a. Drought, over grazing, fire suppression.
1b. Brush control, prescribed grazing

2.a Severe loss of grass cover, fire suppression, erosion.
2b. Brush control, seeding, prescribed grazing.

3. Continued loss of grass cover, erosion.

Figure 4.

State 1

Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Grassland: The historic plant community is a uniformly distributed grassland dominated by black grama, dropseeds, and bluestems. Sand sage and shinnery oak are evenly dispersed throughout the grassland due to the coarse soil surface texture. Perennial and annual forbs are common but their abundance and distribution are reflective of precipitation. Bluestems initially, followed by black grama, decrease with drought and heavy grazing intensity. Historical fire frequency is unknown but likely occurred enough to remove small shrubs to the competitive advantage of grass species. Fire suppression, drought conditions, and excessive grazing drive most grass species out of competition with shrub species.

Diagnosis: Grassland dominated by black grama, dropseeds, and bluestems. Shrubs, such as sand sage, shinnery oak, and mesquite are dispersed throughout the grassland. Forbs are present and populations fluctuate with precipitation variability.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	442	833	1224
Forb	110	208	306
Shrub/Vine	98	184	270
Total	**650**	**1225**	**1800**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	28%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	22%

Figure 6. Plant community growth curve (percent production by month). NM2803, R042XC003NM-Loamy Sand-HCPC. SD-3 Loamy Sand - Warm season plant community .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

State 2
Grass/Shrub

Community 2.1
Grass/Shrub

Grass/Shrub State: The grass/shrub state is dominated by communities of grasses/mesquite, grasses/snakeweed, or grasses/sand sage. Decreases in black grama and bluestem species lead to an increase in bare patches and mesquite which further competes with grass species. An increase of dropseeds and threeawns occurs. Grass distribution becomes more patchy with an absence or severe decrease in black grama and bluestems. Mesquite provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Mesquite mortality when exposed to fire is low due to aggressive resprouting abilities. Herbicide application combined with subsequent prescribed fire may be more effective in mesquite reduction (Britton and Wright 1971).

Diagnosis: This state is dominated by an increased abundance of communities including grass/mesquite, grass/snakeweed, or grass/sand sage. Dropseeds and threeawns have a patchy distribution.

Transition to Grass/Shrub State (1a): The historic plant community begins to shift toward the grass/shrub state as drivers such as drought, fire suppression, interspecific competition, and excessive grazing contribute to alterations in soil properties and herbaceous cover. Cover loss and surface soil erosion are initial indicators of transition followed by a decrease in black grama with a subsequent increase of dropseeds, threeawns, mesquite, and snakeweed. Snakeweed has been documented to outcompete black grama especially under conditions of fire suppression and drought (McDaniel et al. 1984).
Key indicators of approach to transition:
• Loss of black grama cover
• Surface soil erosion
• Bare patch expansion
• Increased dropseed/threeawn and mesquite, snakeweed, or sand sage abundances

Transition to Historic Plant Community (1b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community.

State 3
Shrub Dominated

Community 3.1
Shrub Dominated

Shrub-Dominated State: The shrub-dominated state results from a severe loss of grass cover. This state's primary species is sand sage. Shinnery oak and mesquite also occur; however, grass cover is limited to intershrub distribution. Sand sage stabilizes light sandy soils from wind erosion, which enhances protected grass/forb cover (Davis and Bonham 1979). However, shinnery oak also responds to the sandy soils with dense stands due to an aggressive rhizome system. Shinnery oak's extensive root system promotes competitive exclusion of grasses and forbs. Sand sage, shinnery oak, and mesquite can be controlled with herbicide (Herbel et al. 1979, Pettit 1986).

Transition to Shrub-Dominated (2a): Severe loss of grass species with increased erosion and fire suppression will result in a transition to a shrub-dominated state with sand sage, Shin oak, and honey mesquite directly from the grassland-dominated state.

Key indicators of approach to transition:

• Severe loss of grass species cover
• Surface soil erosion
• Bare patch expansion
• Increased sand sage, shinnery oak, and mesquite abundance

Transition to Historic Plant Community (2b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community. In addition, seeding with native grass species will augment the transition to a grassland-dominated state.

Transition to Shrub-Dominated (3): If the grass/shrub site continues to lose grass cover with soil erosion, the site will transition to a shrub-dominated state with sand sage, shinnery oak, and honey mesquite.

Key indicators of approach to transition:

• Continual loss of dropseeds/threeawns cover
• Surface soil erosion
• Bare patch expansion
• Increased sand sage, shinnery oak, and mesquite/dropseed/threeawn and mesquite/snakeweed abundance

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			61–123	
	little bluestem	SCSC	*Schizachyrium scoparium*	61–123	–
2	**Warm Season**			37–61	
	sand bluestem	ANHA	*Andropogon hallii*	37–61	–
3	**Warm Season**			37–61	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	37–61	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	37–61	–
4	**Warm Season**			123–184	
	black grama	BOER4	*Bouteloua eriopoda*	123–184	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	123–184	–
5	**Warm Season**			123–184	
	thin paspalum	PASE5	*Paspalum setaceum*	123–184	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	123–184	

	plains bristlegrass	SEVU2	*Setaria vulpiseta*	123–184	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	123–184	–
6	**Warm Season**			123–184	
	spike dropseed	SPCO4	*Sporobolus contractus*	123–184	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	123–184	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	123–184	–
7	**Warm Season**			61–123	
	hooded windmill grass	CHCU2	*Chloris cucullata*	61–123	–
	Arizona cottontop	DICA8	*Digitaria californica*	61–123	–
9	**Other Perennial Grasses**			37–61	
	Grass, perennial	2GP	*Grass, perennial*	37–61	–
Shrub/Vine					
8	**Warm Season**			37–61	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	37–61	–
	giant dropseed	SPGI	*Sporobolus giganteus*	37–61	–
10	**Shrub**			61–123	
	sand sagebrush	ARFI2	*Artemisia filifolia*	61–123	–
	Havard oak	QUHA3	*Quercus havardii*	61–123	–
11	**Shrub**			34–61	
	fourwing saltbush	ATCA2	*Atriplex canescens*	37–61	–
	featherplume	DAFO	*Dalea formosa*	37–61	–
12	**Shrub**			37–61	
	jointfir	EPHED	*Ephedra*	37–61	–
	littleleaf ratany	KRER	*Krameria erecta*	37–61	–
13	**Other Shrubs**			37–61	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	37–61	–
Forb					
14	**Forb**			61–123	
	leatherweed	CRPOP	*Croton pottsii var. pottsii*	61–123	–
	Indian blanket	GAPU	*Gaillardia pulchella*	61–123	–
	globemallow	SPHAE	*Sphaeralcea*	61–123	–
15	**Forb**			12–37	
	woolly groundsel	PACA15	*Packera cana*	12–37	–
16	**Forb**			61–123	
	touristplant	DIWI2	*Dimorphocarpa wislizeni*	61–123	–
	woolly plantain	PLPA2	*Plantago patagonica*	61–123	–
17	**Other Forbs**			37–61	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	37–61	–

Animal community

This Ecological Site provides habitat which supports a resident animal community that is characterized by pronghorn antelope, desert cottontail, spotted ground squirrel, black-tailed prairie dog, yellow faced pocket gopher, Ord's kangaroo rat, northern grasshopper mouse, southern plains woodrat, badger, roadrunner, meadowlark, burrowing owl, white necked raven, lesser prairie chicken, morning dove, scaled quail, Harris hawk, side blotched

lizard, marbled whiptail, Texas horned lizard, western diamondback rattlesnake, dusty hognose snake and ornate box turtle.
Where mesquite has invaded, most resident birds and scissor-tailed flycatcher, morning dove and Swainson's hawk, nest. Vesper and grasshopper sparrows utilize the site during migration.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.
Hydrologic Interpretations
Soil Series Hydrologic Group
Berino B
Kinco A
Maljamar B
Pajarito B
Palomas B
Wink B
Pyote A

Recreational uses

This site offers recreation potential for hiking, borseback riding, nature observation, photography and hunting. During years of abundant spring moisture, this site displays a colorful array of wildflowers during May and June.

Wood products

This site has no potential for wood products.

Other products

This site is suitable for grazing by all kinds and classes of livestock at any time of year. In cases where this site has been invaded by brush species it is especially suited for goats. Mismanagement of this site will cause a decrease in species such as the bluestems, blsck grama, bush muhly, plains bristlegrass, New Mexico feathergrass, Arizona cottontop and fourwing saltbush. A corresponding increase in the dropseeds, windmill grass, fall witchgrass, silver bluestem, sand sagebrush, shinery oak and ephedra will occur. This will also cause an increase in bare ground which will increase soil erodibility. This site will respond well to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index Ac/AUM
100 - 76 2.3 – 3.5
75 – 51 3.0 – 4.5
50 – 26 4.6 – 9.0
25 – 0 9.1 +

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Other references

Literature Cited:

Ansley, R. J.; Jacoby, P. W. 1998. Manipulation of fire intensity to achieve mesquite management goals in north Texas. In: Pruden, Teresa L.; Brennan, Leonard A., eds. Fire in ecosystem management: shifting the paradigm from suppression to prescription: Proceedings, Tall Timbers fire ecology conference; 1996 May 7-10; Boise, ID. No. 20. Tallahassee, FL: Tall Timbers Research Station: 195-204.

Ansley, R. J.; Jones, D. L.; Tunnell, T. R.; [and others]. 1998. Honey mesquite canopy responses to single winter fires: relation to herbaceous fuel, weather and fire temperature. International Journal of Wildland Fire 8(4):241-252.

Britton, Carlton M.; Wright, Henry A. 1971. Correlation of weather and fuel variables to mesquite damage by fire. Journal of Range Management 24:136-141.

Davis, Joseph H., III and Bonham, Charles D. 1979. Interference of sand sagebrush canopy with needleandthread. Journal of Range Management 32(5):384-386.

Herbel, C. H, Steger, R, Gould, W. L. 1974. Managing semidesert ranges of the Southwest Circular 456. Las Cruces, NM: New Mexico State University, Cooperative Extension Service. 48 p.

McDaniel, Kirk C.; Pieper, Rex D.; Loomis, Lyn E.; Osman, Abdelgader A. 1984. Taxonomy and ecology of perennial snakeweeds in New Mexico. Bulletin 711. Las Cruces, NM: New Mexico State University, Agricultural Experiment Station. 34 p.

McPherson, Guy R. 1995. The role of fire in the desert grasslands. In: McClaran, Mitchel P.; Van Devender, Thomas R., eds. The desert grassland. Tucson, AZ: The University of Arizona Press: 130-151.

Pettit, Russell D. 1986. Sand shinnery oak: control and management. Management Note 8. Lubbock, TX: Texas Tech University, College of Agricultural Sciences, Department of Range and Wildlife Management. 5 p.

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**

USDA Natural Resources Conservation Service

Ecological site R042XC004NM
Sandy

Accessed: 07/29/2021

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

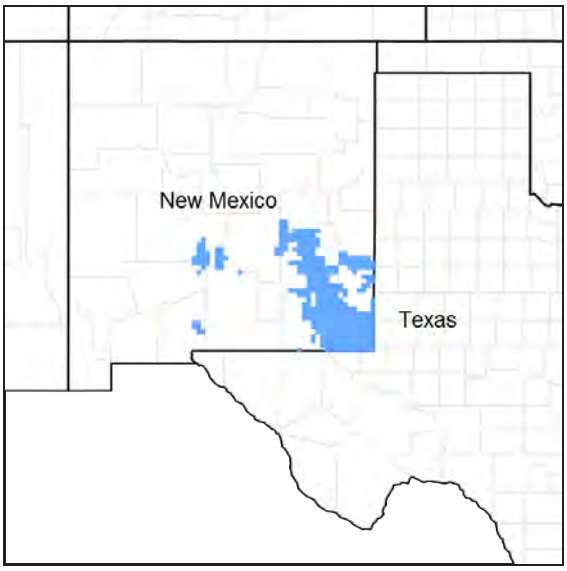


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is on uplands, plains, dunes, fan piedmonts, terraces and in inter dunal areas. The parent material consists of mixed alluvium and or eolian sands or calcareous alluvium derived from sedimentary rock. Slope range on this site range from 0 to 9 percent with the average of 5 percent.

Low stabilized dunes may occur occasionally on this site. Elevations range from 2,800 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan piedmont (3) Terrace
Flooding frequency	None

Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity short duration thunderstorms.
Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.
The average frost-free season is 207 to 220 days. The last killing frost is in late March or early April, and the first killing frost is in late October or early November.
Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest in January through June which rapidly dries out the soil during a critical period for cool season plant growth.

Climate data was obtained from http://www.wrcc.sage.dri.edu/summary/climsmnm.html web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	219 days
Precipitation total (average)	12 in

Influencing water features

This site is not influenced from water from wetlands or streams.

Soil features

Soils are moderately deep or very deep. Surface textures are loamy fine sand, fine sandy loam, loamy very fine sand or gravelly sandy loam.

Subsurface is a sandy loam, loam, sandy clay loam, clay loam (contains more than 45 percent sand and 18 to 35 percent clay) and less than 15 percent carbonates.

Substratum is a sandy loam, fine sandy loam, sandy clay loam, clay loam, coarse sandy loam, or coarse sand and Calcium carbonate equivalent of 15 to 40 percent. Some layers high in lime or with caliche fragments may occur at depths of 20 to 30 inches.

These soils, if unprotected by plant cover and organic residue, become wind blown and low hummocks are formed. They contains more than 45 percent sand and 18 to 35 percent clay.

Minimum and maximum values listed below represent the characteristic soils for this site.

Characteristic Soils Are:
Anthony
Berino

Cacique
Harkey
Pajaritio
Reakor
Mobeetie
Wink
Sotim
Vinton
Drake
Onite
Alma
Poquita
Dona Ana
Monahans

Note: *Cacique soils is a shallow soil.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Sandy loam (3) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately rapid to moderately slow
Soil depth	30–72 in
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3–11 in
Calcium carbonate equivalent (0-40in)	5–30%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

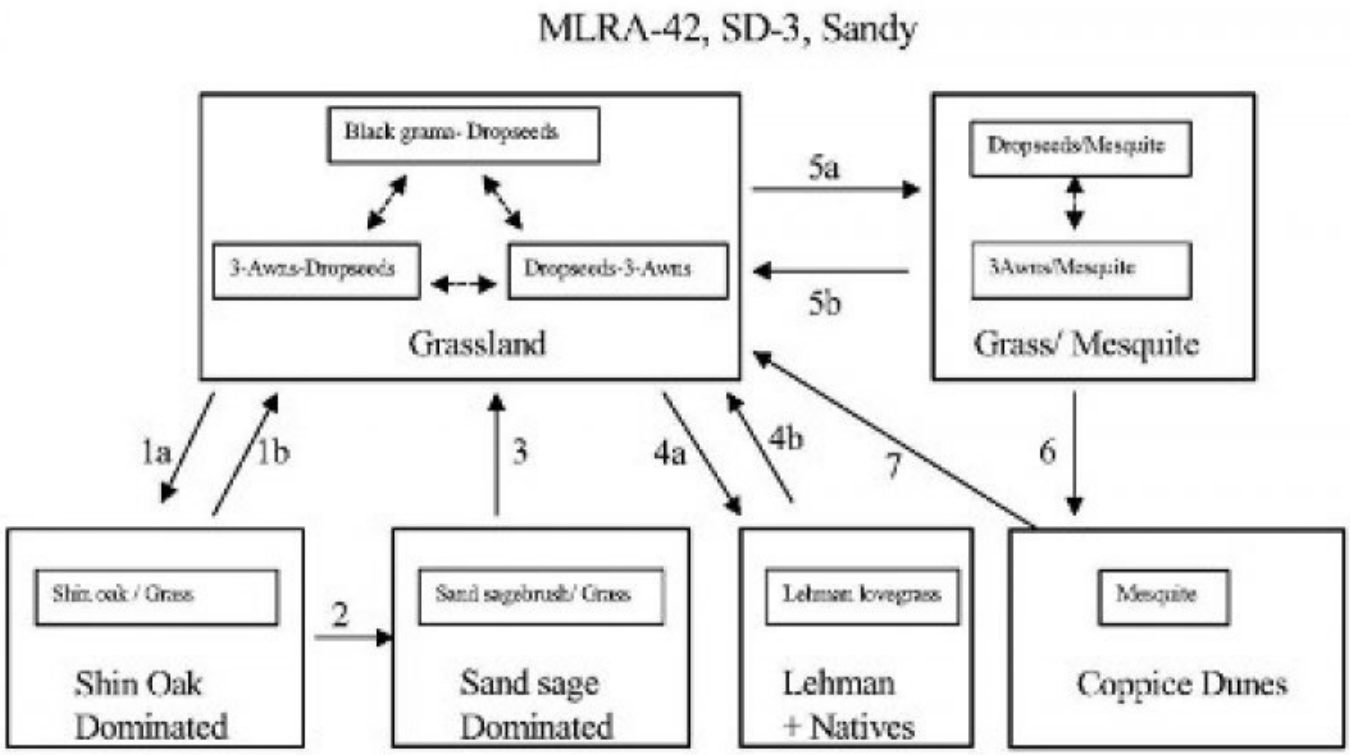
Overview

The Sandy site often intergrades with the Loamy Sand and Deep Sand sites (SD-3). Sandy sites occur on plains, fans, or terraces between drainages. Slopes average less than five percent. Surface textures are usually sandy loams. The historic plant community of the Sandy site is dominated by black grama (*Bouteloua eriopoda*) and dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*). Blue grama (*B. gracilis*) also occurs as a

subdominant species. Perennial and annual forb abundance is distributed relative to precipitation occurrence. Litter and to a lesser extent, bare ground, compose a significant proportion of the ground cover while grasses compose the remainder. Decreases in black grama and other grass species' cover indicate a transition to states with an increased shrub component. Shinnery oak (*Quercus havardii*), sand sage(*Artemisia filifolia*), and honey mesquite (*Prosopis glandulosa*) can all increase in composition. Lehmann lovegrass (*Eragrostis lehmanniana*) also may occur as a result of invasion and competition among grass species. Heavy grazing intensity and/or drought are influential in decreasing grass cover and subsequently increasing shrub cover. Fire suppression further supports shrub cover increase and an advantage over grass species. However, brush and grazing management may restore grass species and reverse shrub or grass/shrub dominated states back toward the historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Climate, fire suppression, competition, over grazing
1b. Brush control, Prescribed grazing

2.Brush control (insufficient chemical).

3. Brush control

4a. Invasion from seeded areas.
4b. Brush control reseed native species.

5a. Overgrazing, seed dispersal, lack of fire.
5b. Brush control, prescribed fire.

6.Severe loss of grass cover, wind erosion.

7. Brush control, seeding

Figure 6.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Grassland: The historic plant community is composed primarily of black grama, dropseeds, and a secondary component of blue grama. Black grama tends to dominate due to the predominance of sandy loam soils; however,

dropseeds increase on more loamy soils. Perennial and annual forbs are common but their abundance and distribution are dependent on seasonal precipitation. Historical fire frequency is unknown but probably contributed to shrub reduction to the competitive advantage of grass species. Excessive grazing and drought are likely the dominant drivers that decrease black grama and increase dropseed and threeawn abundance within the historic plant community. Black grama has low seed viability, and therefore, reproduces vegetatively during the summer growing season. However, black grama growth is delayed one season after normal precipitation. Black grama is dormant for the remainder of the year; however, black grama retains nutritive value yearlong for grazing. In contrast, dropseeds have relatively abundant, viable seed production and can benefit from early spring as well as summer precipitation. Threeawns also respond to spring and summer moisture and tend to be the year's first palatable species. Threeawns and dropseeds, however, are not palatable during dormant periods, which extends grazing pressure to black grama. Moderate to heavy grazing reduces vegetative cover of black grama which increases its susceptibility to wind erosion and drought (Canfield 1939). Black grama is especially vulnerable to grazing during the summer growing season when stoloniferous growth and rooting occur. Black grama sustains short droughts through reduction of plant tufts which will subsequently emerge with sufficient moisture. Prolonged drought or grazing concurrently under drought conditions can delay or impede recovery of black grama (Nelson 1934) and increase abundance of dropseeds, threeawns, and blue grama. Historical fire events may have benefited black grama, especially, frequent, light intensity/severity fires in conjunction with sufficient moisture to increase stolon production (McPherson 1995). Fires which were hot and severe, however, probably contributed to black grama mortality, more so in drought conditions.

Diagnosis: This state is a grassland dominated by black grama, dropseeds, and threeawns, with subdominant blue grama. Shrubs, such as sand sage and mesquite, are sparsely dispersed throughout the grassland. Forb populations are present and fluctuate with precipitation variability.

Other grasses that could appear on this site include: fall withchgrass, slim tridens, Almejita signalgrass, Indian ricegrass and fluffgrass.

Other shrubs include: pale wolfberry, lotebush, tarbush, Apacheplume, and mesquite.

Other forbs include: plains tickseed, plains blackfoot, scorpionweed, nama, wooly guara, wooly dalea, spectaclepod mustard, bladderpod mustard, menodora, prickly lettuce, lambsquarter, wooly Indianwheat and wild buckwheat.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	480	720	960
Forb	90	135	180
Shrub/Vine	30	45	60
Total	**600**	**900**	**1200**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	35-40%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	35-45%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%

Bare ground	15-20%

Figure 8. Plant community growth curve (percent production by month). NM2804, R042XC004NM-Sandy-HCPC. SD-3 Sandy - Warm season plant community .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	4	10	10	25	30	12	5	0	0

State 2
Shinnery Oak Dominated

Community 2.1
Shinnery Oak Dominated

Shinnery Oak Dominated: This state is dominated by Shinnery oak with subdominant grass species from the historic plant community. Bare ground is a significant component in this state. Shinnery oak tends to be clumped in distribution in finer soil textures. Shinnery oak density increases (as well as dropseeds, threeawns, and blue grama) in coarse textured (e.g., Loamy Sand sites) and deeper, coarse textured (e.g., Deep Sand and Sandhills sites) soils. Shinnery oak predominates during periods of above average (i.e., 16 in.) precipitation during the months of July and August. Abundance and distribution also increases with disturbance, such as excessive grazing and fire, due to an aggressive rhizome system. Shinnery oak's extensive root system allows competitive exclusion of grasses and forbs. Brush control with herbicide treatments applied in the spring can reduce Shinnery oak (Herbel et al. 1979, Pettit 1986). In addition, repetitive seasons of goat browsing can also decrease Shinnery oak abundance. However, brush management should maintain shrub patches to prevent erosion and to provide wildlife cover and forage.

Diagnosis: This state represents a clumped distribution of Shinnery oak with patches of bare ground and subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Shinnery oak density increases, as do dropseeds, threeawns, and blue grama, as Sandy site intergrades with Deep Sand and Sandhills sites.

Transition to Shinnery Oak-Dominated State (1a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Shinnery oak as a result of drought, above average precipitation (>16 inches), grazing, fire suppression, interspecific competition, and coarse textured soils.

Key indicators of approach to transition:
• Loss of black grama and other grass species cover
• Increase of dropseed/threeawn and shinnery oak
• Surface soil erosion and bare patch expansion

Transition to Historic Plant Community (1b): The Shinnery oak-dominated state begins to transition toward the historic plant community as drivers such as drought, but also above average precipitation (e.g., 16 inches) discontinue. Brush control can also drive the Shinnery oak state toward a grassland state.

State 3
Sand Sage Dominated

Community 3.1
Sand Sage Dominated

Sand Sage Dominated: This state is dominated by sand sage with subdominant grass species from the historic plant community. Sand sage occurs as a result of insufficient herbicide application in Shinnery oak dominated sites with subdominant sand sage. Sand sage either reestablishes dominance or colonizes from an off-site location and stabilizes soils. Sand sage stabilizes light sandy soils from wind erosion and provides a harbor for grass and forb species in heavily grazed conditions (Davis and Bonham 1979). Sand sage abundance increases with drought and/or heavy grazing, but decreases with light grazing due to herbaceous plant competition. Grass and forb species can reestablish as competition from sand sage is relatively light. Herbicide applied in the spring, especially when

growth and photosynthesis rates are greatest, can reduce sand sage if there is subsequent rest from grazing (Herbel et al. 1979, Pettit 1986). Brush management should maintain patches of sand sage to prevent wind erosion and subsequent dune formation.

Diagnosis: This state is dominated by sand sage with subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Sand sage tends to occur in sites with coarser textured soils.

Transition to Sand Sage Dominated (2): Sand sage appears from off-site locations and/or increases after insufficient herbicide applications aimed at removing Shinnery oak and sand sage.

Key indicators of approach to transition:
• Increase of sand sage seedlings and grasses
• Reduced soil erosion

Transition to Historic Plant Community (3): The sand sage dominated state transitions toward the historic plant community as sand sage decreases primarily through brush management but also with light intensity grazing management. Drought reduction will also support a transition to the historic plant community.

State 4
Lehmann Lovegrass + Natives

Community 4.1
Lehmann Lovegrass + Natives

Lehmann Lovegrass + Natives: This state is dominated by Lehmann lovegrass with subdominant grass species from the historic plant community. Lehmann lovegrass is a warm-season, perennial bunchgrass that was introduced from South Africa in the 1930's for rangeland restoration purposes (Humphrey 1970). Lehmann lovegrass invades from off-site locations with projects utilizing lovegrass for reseeding, soil stabilization, or highway projects. Lehmann lovegrass provides a winter and early spring forage for grazing. Lehmann lovegrass is vigorous in sandy to sandy loam soils which receive approximately 6-8 inches of summer precipitation (Cox et al. 1988). Lehmann lovegrass's aggressive competitive exclusion of native grass species has been attributed to lovegrass's low summer palatability, which reduces vigor of native species and allows lovegrass to increase vigor before grazing. Also, Lehmann lovegrass abundant seed production and establishment, especially after disturbances, allows for increased competition (Cable 1971, Cox et al. 1981). Lehmann lovegrass generally is tolerant to fire because of an aggressive seed-bank; however, severe fires can cause mature lovegrass mortality (Sumrall et al. 1991). Herbicide and reseeding is recommended for control of Lehmann lovegrass (Winn 1991).

Diagnosis: Lehmann lovegrass and grass species from the historic plant community, such as black grama, dropseeds, threeawns, and blue grama, dominate this state.

Transition to Lehmann lovegrass and native grass species (4a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Lehmann lovegrass as a result of drought, grazing, fire and interspecific competition from nearby sources of Lehmann lovegrass.

Key indicators of approach to transition:
• Loss of black grama and other grass species cover
• Disturbance and nearby source of Lehmann lovegrass
• Increase of Lehmann lovegrass seedlings

Transition to Historic Plant Community (4b): The Lehmann lovegrass/native grass state transitions toward the historic plant community after actions such as herbicide application and native reseeding have occurred. In addition, prevention of disturbances such as fire and livestock grazing also will encourage the transition to a native grass community

State 5
Grass/Mesquite

Community 5.1
Grass/Mesquite

Grass/Mesquite: This state is dominated by honey mesquite with dropseeds and/or threeawns. Black grama generally is rare as a result of heavy grazing intensity. Honey mesquite invades through seed dispersal from grazing livestock and/or wildlife. Dropseeds and threeawns cohabitate with mesquite due to sufficient precipitation. Mesquite tends to be arborescent due to less soil erosion relative to the Coppice Dunes state which reflects large soil loss. Mesquite obtains approximately half of its nitrogen from symbiotic bacteria housed in root nodules (Lajtha and Schlesinger 1986). Mesquite also provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Historical fire occurrences reduced mesquite abundance by disrupting seed production cycles and suppressing seedlings; thus, grass species remained dominant. However, fire suppression has allowed mesquite to increase in density and abundance, increasing mesquite resistance to fires through aggressive resprouting. Herbicide application combined with subsequent prescribed fire may be effective in mesquite reduction (Britton and Wright 1971).

Diagnosis: This state is co-dominated by honey mesquite and dropseeds or threeawns.

Transition to Grass/Mesquite State (5a): This state occurs due to a decrease in black grama primarily from heavy grazing intensity and from an introduction of mesquite seeds from grazers. Dropseeds and threeawns increase and co-exist in the absence of black grama. Fire suppression also is responsible for an increase in mesquite.

Key indicators of approach to transition:
• Loss of black grama
• Increase of dropseeds and/or threeawns
• Increase of mesquite seedlings

Transition to Historic Plant Community (5b): Transition to the historic plant community requires brush management though herbicide application and possibly prescribed fire to reduce mesquite abundance. Once shrub species are removed, prescribed fire may be useful in maintaining a dominant grassland. Precipitation is also necessary in conjunction with management activities to support a dominant grassland.

State 6
Coppice Dunes

Community 6.1
Coppice Dunes

Coppice Dunes: This state is dominated by coppice mesquite dunes with minimal or no grass cover. Honey mesquite occurs in a multi-stemmed growth form which cultivates it’s dune formation by entrapping drifting sands. Mesquite utilizes its extensive tap and lateral roots to benefit from moisture deep in coarse textured soils. Grass species cannot compete for moisture, especially with compounding perturbations such as heavy grazing and drought. Soils succumb to wind erosion with the depletion of grass cover and eventually dunes form around mesquite plants (Gould 1982). Brush management is limited to herbicide application, biological control, or manual removal, as a lack of grass cover prevents prescribed burning. Seeding subsequent to brush control may transition this State toward the historic plant community.

Diagnosis: This state is characterized by low growing, multi-stemmed mesquite plants which form Coppice dunes by drifting soils from wind erosion. As grass cover decreases, windblown soils are removed from unprotected, inter-dune areas. Soils are then re-deposited on dunes which increases dune size.

Transition to Mesquite Coppice Dunes State (6): Decrease in black grama with subsequent decrease in dropseeds and threeawns due to competition with mesquite especially during drought, heavy grazing, and fire suppression. Competitive exclusion of grasses leads to wind erosion of sandy soils and dune formation of low growing mesquite plants.

Key indicators of approach to transition:
• Loss of black grama and other grass species cover

• Wind erosion as evidenced by pedestalled plants
• Bare patch expansion
• Increase of Coppice dune mesquites

Transition to Historic Plant Community (7): Transition toward the historic plant community requires mesquite removal though either herbicide application, biological control, or manual removal. In addition, seeding of native grass species with subsequent years of sufficient moisture is critical.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			315–360	
	black grama	BOER4	*Bouteloua eriopoda*	315–360	–
2	**Warm Season**			45–90	
	blue grama	BOGR2	*Bouteloua gracilis*	45–90	–
3	**Warm Season**			27–45	
	bush muhly	MUPO2	*Muhlenbergia porteri*	27–45	–
4	**Warm Season**			90–135	
	spike dropseed	SPCO4	*Sporobolus contractus*	90–135	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	90–135	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	90–135	–
5	**Warm Season**			27–45	
	threeawn	ARIST	*Aristida*	27–45	–
6	**Warm Season**			27–45	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	27–45	–
7	**Warm Season**			27–45	
	Arizona cottontop	DICA8	*Digitaria californica*	27–45	–
8	**Warm Season**			45–72	
	silver bluestem	BOSA	*Bothriochloa saccharoides*	45–72	–
	little bluestem	SCSC	*Schizachyrium scoparium*	45–72	–
9	**Warm Season**			9–27	
	vine mesquite	PAOB	*Panicum obtusum*	9–27	–
10	**Warm Season**			9–27	
	tobosagrass	PLMU3	*Pleuraphis mutica*	9–27	–
11	**Other Perennial Grasses**			9–27	
	Grass, perennial	2GP	*Grass, perennial*	9–27	–
Shrub/Vine					
12	**Shrub**			9–45	
	yucca	YUCCA	*Yucca*	9–45	–
13	**Shrub**			9–27	
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	9–27	–
14	**Shrub**			9–27	
	fourwing saltbush	ATCA2	*Atriplex canescens*	9–27	–

15	**Shrub**			9–27	
	jointfir	EPHED	*Ephedra*	9–27	–
16	**Shrub**			9–27	
	javelina bush	COER5	*Condalia ericoides*	9–27	–
17	**Shrub**			9–27	
	sand sagebrush	ARFI2	*Artemisia filifolia*	9–27	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	9–27	–
18	**Other Shrubs**			9–27	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	9–27	–
Forb					
19	**Forb**			27–63	
	croton	CROTO	*Croton*	27–63	–
	globemallow	SPHAE	*Sphaeralcea*	27–63	–
20	**Forb**			27–45	
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	27–45	–
	woolly groundsel	PACA15	*Packera cana*	27–45	–
21	**Forb**			9–27	
	Adonis blazingstar	MEMU3	*Mentzelia multiflora*	9–27	–
22	**Forb**			27–45	
	redstem stork's bill	ERCI6	*Erodium cicutarium*	27–45	–
	Texas stork's bill	ERTE13	*Erodium texanum*	27–45	–
23	**Other Forbs**			9–27	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	9–27	–

Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, spotted ground squirrel, black-tailed prairie dog, yellow-faced pocket gopher, Ord's kangaroo rat, Northern grasshopper mouse, southern plains woodrat, badger, meadowlark, roadrunner, burrowing owl, white-necked raven, cactus wren, pyrrhuloxia, lesser prairie chicken, mourning dove, scaled quail, Harris' hawk, side-blotched lizard, marbled whiptail, Texas horned lizard, prairie rattlesnake, plains spadefoot toad, and ornate box turtle.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.
Hydrologic Interpretations

Soil Series Hydrologic Group
Anthony B
Berino B
Cacique C *shallow soil
Harkey B
Pajaritio B
Reakor B
Mobeetie B
Wink B
Sotim B
Vinton B

Drake B
Onite B
Alma B
Poquita B
Dona Ana B
Monahans B

Recreational uses

This site offers recreation potential for hiking, horseback riding, nature observation, and photography, bird, antelope and predator hunting. During years of abundant spring moisture, this site displays a colorful array of wildflowers.

Wood products

This site has no potential for wood products.

Other products

This site is suitable for grazing by all classes and kinds of livestock during all seasons of the year. Under retrogression, plants such as black grama, blue grama, bush muhly, plains bristlegrass, Arizona cottontop, vine mesquite, little bluestem and fourwing saltbush will decrease while the dropseeds, threeawns, tobosa, yucca, catclaw mimosa, javelinabush, mesquite and broom snakeweed will increase. This site responds well to brush management and deferment. It is best suited to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 2.7 – 3.8
75 – 51 3.5 – 5.0
50 – 26 5.0 – 8.0
25 – 0 8.1 +

Inventory data references

Other References:
Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Other references

Other References:
Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Literature Cited

Ansley, R. J.; Jacoby, P. W. 1998. Manipulation of fire intensity to achieve mesquite management goals in north Texas. In: Pruden, Teresa L.; Brennan, Leonard A., eds. Fire in ecosystem management: shifting the paradigm from suppression to prescription: Proceedings, Tall Timbers fire ecology conference; 1996 May 7-10; Boise, ID. No. 20. Tallahassee, FL: Tall Timbers Research Station:195-204.

Ansley, R. J.; Jones, D. L.; Tunnell, T. R.; [and others]. 1998. Honey mesquite canopy responses to single winter fires: relation to herbaceous fuel, weather and fire temperature. International Journal of Wildland Fire 8(4):241-252.

Britton, Carlton M.; Wright, Henry A. 1971. Correlation of weather and fuel variables to mesquite damage by fire. Journal of Range Management 24:136-141.

Cable, Dwight R. 1971. Lehmann lovegrass on the Santa Rita Experimental Range, 1937-1968. Journal of Range Management 24:17-21.

Canfield, R. H. 1939. The effect of intensity and frequency of clipping on density and yield of black grama and tobosa grass. Tech. Bull. 681. Washington, DC: U.S. Department of Agriculture. 32 p.

Cox, Jerry R.; Ruyle, G.B.; Fourle, Jan H.; Donaldson, Charlie. 1988. Lehmann lovegrass—central South Africa and Arizona, USA. Rangelands 10(2):53-55

Contributors

Don Sylvester
Quinn Hodgson

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

---

7. **Amount of litter movement (describe size and distance expected to travel):**

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

---

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

---

14. **Average percent litter cover (%) and depth (in):**

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

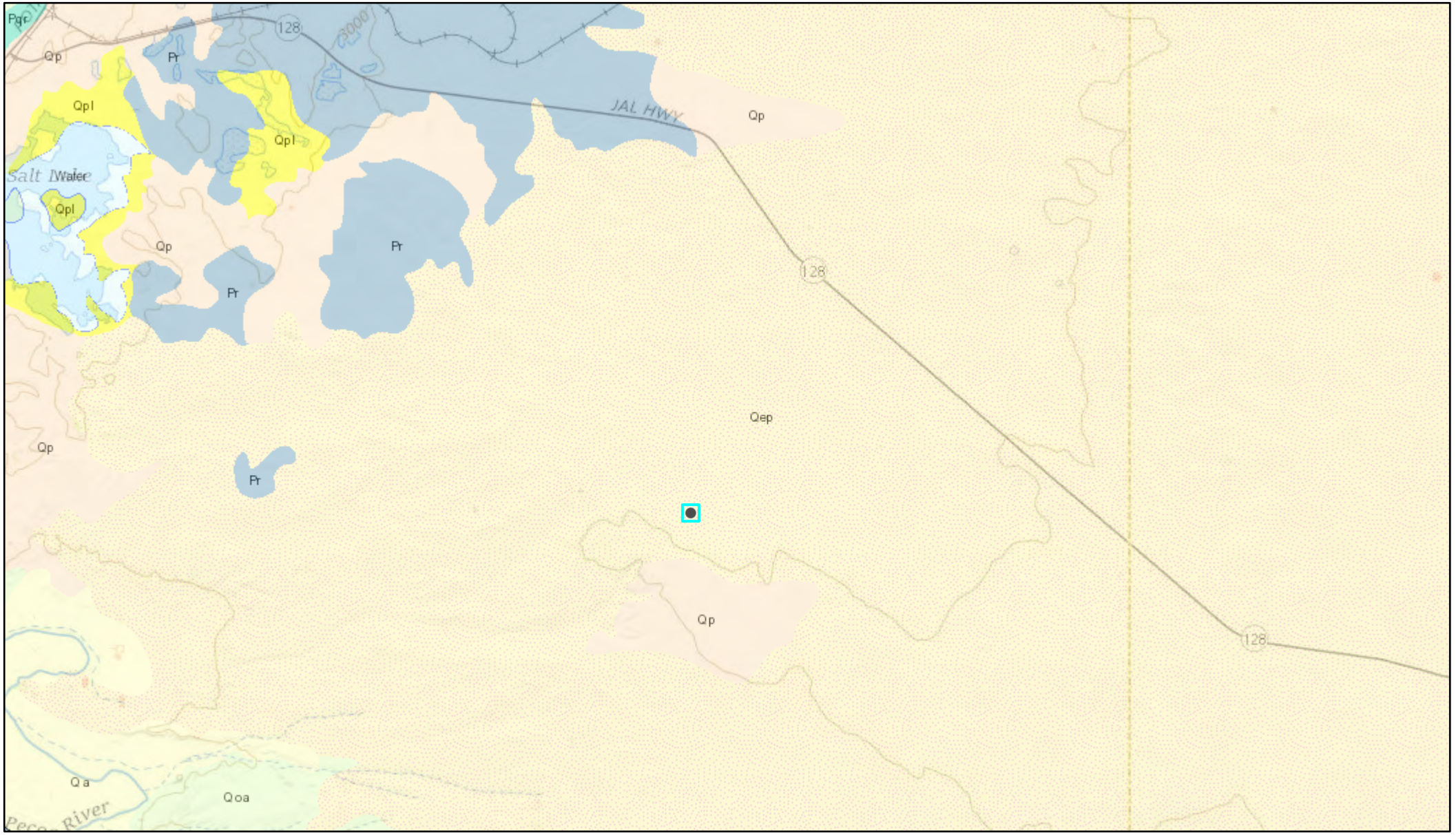
---

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state**

for the ecological site:

17. **Perennial plant reproductive capability:**

ArcGIS Web Map



3/1/2021, 10:58:49 AM

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

Faults

Fault, Exposed

Fault, Intermittent

Fault, Concealed

Shere Zone

NMBGMR, 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 Global Ecosystems; U.S.

ArcGIS Web AppBuilder

ATTACHMENT 4

Natalie Gordon

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Tuesday, October 27, 2020 1:43 PM
To: Natalie Gordon
Subject: Fwd: NAB1721929878: Blackjack 1 Federal #2 - 48-hr Notification of Confirmation Sampling

---------- Forwarded message ---------
From: **Dhugal Hanton** <vertexresourcegroupusa@gmail.com>
Date: Tue, Oct 27, 2020 at 1:42 PM
Subject: NAB1721929878: Blackjack 1 Federal #2 - 48-hr Notification of Confirmation Sampling
To: Enviro, OCD, EMNRD <OCD.Enviro@state.nm.us>, CFO_Spill, BLM_NM <blm_nm_cfo_spill@blm.gov>, Kelsey <KWade@blm.gov>, Amos, James A <Jamos@blm.gov>
Cc: <tom.bynum@dvn.com>, <Lupe.Carrasco@dvn.com>, <amanda.davis@dvn.com>, <wesley.mathews@dvn.com>

All,

Please accept this email as 48-hr notification that Vertex Resource Services Inc. has scheduled remediation fieldwork and confirmatory sampling to be conducted at Blackjack 1 Federal #2 for the release that occurred on July 16, 2017. Incident tracking # NAB1721929878 (2RP-4319).

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

On Wednesday, October 28, 2020 at approximately 9 a.m., Kevin Smith of Vertex will be onsite to guide remediation fieldwork (weather permitting). Remediation activities are expected to last three days. As the work begins to wrap up in each area, Kevin will commence confirmatory sampling. Confirmatory sampling is expected to begin on Thursday, October 29, 2020, at approximately 12:00 p.m. The confirmatory sampling and remediation fieldwork are expected to last through the end of the day, Friday, October 30, 2020.

If you need directions to the site, please do not hesitate to contact Kevin at 575-988-0871. 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

ATTACHMENT 5

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/28/2020
Site Location Name:	Blackjack 1 Federal #2	Report Run Date:	11/2/2020 5:23 PM
Client Contact Name:	Amanda Davis	API #:	30-015-33383
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Blackjack 1 Federal #2	Project Owner:	Amanda Davis
Project Reference #	Poly Flow Line release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	10/28/2020 9:02 AM
Departed Site	10/28/2020 3:42 PM

Field Notes

8:26 Remediation activity with CCI beginning at site. Depth to groundwater criteria is less than 50 feet below ground surface. Excavation depth will be 6 inches to 2 feet.

8:27 The area where excavation will be extended past two feet is near the poly line where the point of release is.

Next Steps & Recommendations

1 Continue remediation activity by excavating remaining impacted Area.

Daily Site Visit Report

Site Photos

Viewing Direction: Northwest	**Viewing Direction**: West
	
Remediation in progress	Remediation in progress
Viewing Direction: West	**Viewing Direction**: South
	
Excavation footprint (six inches)	Excavation in progress

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Kevin Smith

Signature: 

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/29/2020
Site Location Name:	Blackjack 1 Federal #2	Report Run Date:	11/2/2020 5:38 PM
Client Contact Name:	Amanda Davis	API #:	30-015-33383
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Blackjack 1 Federal #2	Project Owner:	Amanda Davis
Project Reference #	Poly Flow Line release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	10/29/2020 9:04 AM
Departed Site	10/29/2020 3:38 PM

Field Notes

10:25 Remaining impacted areas are excavated so that soil is below 50 foot depth to groundwater criteria.

10:26 CCI will secure excavation when complete with fencing.

10:27 A total of 20 base samples and 7 side wall samples will be completed when remediation is complete.

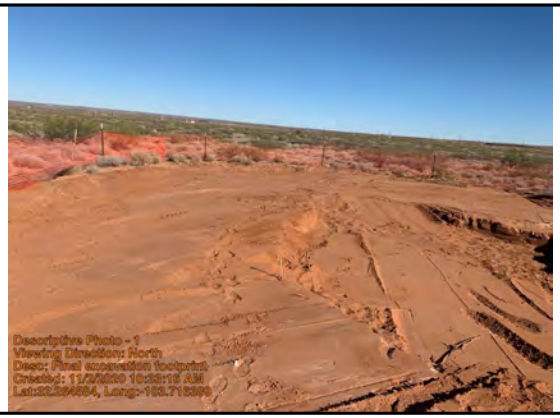
Next Steps & Recommendations

1 Await laboratory analysis of the submitted confirmation samples.

2 Schedule backfill with CCI if samples are below closure criteria.

Daily Site Visit Report

Site Photos

Viewing Direction: North	**Viewing Direction**: South
	
Final excavation footprint	Final excavation footprint
Viewing Direction: South	**Viewing Direction**: North
	
Final excavation footprint	Final excavation footprint

Daily Site Visit Report

Viewing Direction: West	**Viewing Direction**: South
	
Final excavation footprint	Final excavation footprint

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Kevin Smith

Signature: 

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	12/15/2020
Site Location Name:	Blackjack 1 Federal #2	Report Run Date:	4/16/2021 4:32 PM
Client Contact Name:	Amanda Davis	API #:	30-015-33383
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Blackjack 1 Federal #2	Project Owner:	Amanda Davis
Project Reference #	Poly Flow Line release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	12/15/2020 7:13 AM
Departed Site	12/15/2020 10:30 AM

Field Notes

7:16 Gather photos of pre backfill.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: Northeast	**Viewing Direction**: West
	
Looking north east.	Looking west.
Viewing Direction: Southwest	**Viewing Direction**: West
	
Facing southwest.	Stock pile.

Daily Site Visit Report

Viewing Direction: East

Beginning of backfill.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: John Ramirez

Signature:

ATTACHMENT 6

Client Name: Devon Energy Production Company
Site Name: Blackjack 1 Federal #2
NM OCD Incident Tracking Numbers: NAB1721929878
Project #: 21E-02816-03
Lab Report: 2004B73

Table 2. Characterization Sample Field Screening Results - Depth to Groundwater < 50 ft

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Quantab - High/Low)	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(ppm)	(ppm)	(+/-)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SS20-01	0	April 27, 2020	-	-	-	<0.025	<0.222	<4.9	13	<47	13	13	110
SS20-02	0	April 27, 2020	-	-	-	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	97
SS20-03	0	April 27, 2020	-	-	-	<0.024	<0.212	<4.7	<9.6	<48	<14.3	<62.3	<60
SS20-04	0	April 27, 2020	-	-	-	<0.024	<0.220	<4.9	<9.9	<50	<14.8	<64.8	<59
SS20-05	0	April 27, 2020	-	-	-	<0.025	<0.225	<5.0	<9.6	<48	<14.6	<62.6	<60
BH20-01	0	April 27, 2020	-	-	-	<0.025	<0.224	<5.0	10	<48	10	10	**1,600**
BH20-02	1.5	April 27, 2020	-	-	-	<0.025	<0.225	<5.0	<8.9	<44	<13.9	<57.9	<60

"-" - Not applicable/assessed
Bold and shaded indicates exceedance outside of applied action level

Client Name: Devon Energy Production Company
Site Name: Blackjack 1 Federal #2
NM OCD Incident Tracking Numbers: NAB1721929878
Project #: 21E-02816-03
Lab Report: 2010D75

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

Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BS20-01	3	October 29, 2020	<0.025	<0.225	<5.0	<9.5	<48	<14.5	<62.5	<60
BS20-02	3	October 29, 2020	<0.025	<0.222	<4.9	<9.3	<47	<14.2	<61.2	<60
BS20-03	2	October 29, 2020	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
BS20-04	2	October 29, 2020	<0.025	<0.225	<5.0	<9.5	<48	<14.5	<62.5	<60
BS20-05	0.5	October 29, 2020	<0.024	<0.220	<4.9	<9.3	<47	<14.2	<61.2	<60
BS20-06	0.5	October 29, 2020	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	<60
BS20-07	0.5	October 29, 2020	<0.024	<0.219	<4.9	<8.6	<43	<13.5	<56.5	<60
BS20-08	0.5	October 29, 2020	<0.024	<0.219	<4.9	<9.9	<49	<14.8	<63.8	<60
BS20-09	0.5	October 29, 2020	<0.025	<0.221	<4.9	12	<45	12	12	<59
BS20-10	0.5	October 29, 2020	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	<61
BS20-11	0.5	October 29, 2020	<0.025	<0.221	<4.9	10	<42	10	10	<59
BS20-12	0.5	October 29, 2020	<0.025	<0.221	<4.9	<9.7	<49	<14.6	<63.6	<60
BS20-13	0.5	October 29, 2020	<0.025	<0.224	<5.0	<9.6	<48	<14.6	<62.6	<60
BS20-14	0.5	October 29, 2020	<0.025	<0.224	<5.0	<8.7	<44	<13.7	<57.7	<60
BS20-15	0.5	October 29, 2020	<0.025	<0.224	<5.0	<8.7	<44	<13.7	<57.7	<60
BS20-16	0.5	October 29, 2020	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	180
BS20-17	0.5	October 29, 2020	<0.025	<0.224	<5.0	<8.9	<44	<13.9	<57.9	<60
BS20-18	0.5	October 29, 2020	<0.025	<0.225	<5.0	<9.7	<49	<14.7	<63.7	230
BS20-19	0.5	October 29, 2020	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	<61
BS20-20	0.5	October 29, 2020	<0.025	<0.224	<5.0	16	<49	16	16	<59
WS20-01	0-3	October 29, 2020	<0.025	<0.225	<5.0	<9.9	<49	<14.9	<63.9	<60
WS20-02	0-2	October 29, 2020	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	<59
WS20-03	0-0.5	October 29, 2020	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
WS20-04	0-0.5	October 29, 2020	<0.025	<0.224	<5.0	<9.9	<50	<14.9	<64.9	<59
WS20-05	0-0.5	October 29, 2020	<0.025	<0.221	<4.9	<9.9	<49	<14.8	<63.8	<60
WS20-06	0-0.5	October 29, 2020	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	<60
WS20-07	0-0.5	October 29, 2020	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	<61

"-" - Not applicable/assessed
Bold and shaded indicates exceedance outside of NM OCD Closure Criteria

ATTACHMENT 7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

May 04, 2020

Natalie Gordon

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

RE: Blackjack 1 Federal 2 OrderNo.: 2004B73

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 7 sample(s) on 4/29/2020 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 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-001 **Matrix:** SOIL

Client Sample ID: SS20-01 0'
Collection Date: 4/27/2020 12:08:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	110	60		mg/Kg	20	5/1/2020 6:15:41 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/30/2020 1:01:21 PM	52164
Surr: BFB	98.2	70-130		%Rec	1	4/30/2020 1:01:21 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	13	9.4		mg/Kg	1	5/1/2020 11:06:57 AM	52196
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	5/1/2020 11:06:57 AM	52196
Surr: DNOP	93.9	55.1-146		%Rec	1	5/1/2020 11:06:57 AM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/30/2020 1:01:21 PM	52164
Toluene	ND	0.049		mg/Kg	1	4/30/2020 1:01:21 PM	52164
Ethylbenzene	ND	0.049		mg/Kg	1	4/30/2020 1:01:21 PM	52164
Xylenes, Total	ND	0.099		mg/Kg	1	4/30/2020 1:01:21 PM	52164
Surr: 1,2-Dichloroethane-d4	78.7	70-130		%Rec	1	4/30/2020 1:01:21 PM	52164
Surr: 4-Bromofluorobenzene	99.5	70-130		%Rec	1	4/30/2020 1:01:21 PM	52164
Surr: Dibromofluoromethane	90.9	70-130		%Rec	1	4/30/2020 1:01:21 PM	52164
Surr: Toluene-d8	92.0	70-130		%Rec	1	4/30/2020 1:01:21 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-002 **Matrix:** SOIL

Client Sample ID: SS20-02 0'
Collection Date: 4/27/2020 12:31:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	97	60		mg/Kg	20	5/1/2020 6:52:54 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/30/2020 2:27:23 PM	52164
Surr: BFB	97.7	70-130		%Rec	1	4/30/2020 2:27:23 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	5/1/2020 11:31:28 AM	52196
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	5/1/2020 11:31:28 AM	52196
Surr: DNOP	88.1	55.1-146		%Rec	1	5/1/2020 11:31:28 AM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/30/2020 2:27:23 PM	52164
Toluene	ND	0.049		mg/Kg	1	4/30/2020 2:27:23 PM	52164
Ethylbenzene	ND	0.049		mg/Kg	1	4/30/2020 2:27:23 PM	52164
Xylenes, Total	ND	0.099		mg/Kg	1	4/30/2020 2:27:23 PM	52164
Surr: 1,2-Dichloroethane-d4	80.2	70-130		%Rec	1	4/30/2020 2:27:23 PM	52164
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	4/30/2020 2:27:23 PM	52164
Surr: Dibromofluoromethane	90.6	70-130		%Rec	1	4/30/2020 2:27:23 PM	52164
Surr: Toluene-d8	93.9	70-130		%Rec	1	4/30/2020 2:27:23 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-003 **Matrix:** SOIL

Client Sample ID: SS20-03 0'
Collection Date: 4/27/2020 1:04:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	60		mg/Kg	20	5/1/2020 7:05:18 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/30/2020 3:53:11 PM	52164
Surr: BFB	98.8	70-130		%Rec	1	4/30/2020 3:53:11 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/1/2020 11:55:47 AM	52196
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/1/2020 11:55:47 AM	52196
Surr: DNOP	72.1	55.1-146		%Rec	1	5/1/2020 11:55:47 AM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	4/30/2020 3:53:11 PM	52164
Toluene	ND	0.047		mg/Kg	1	4/30/2020 3:53:11 PM	52164
Ethylbenzene	ND	0.047		mg/Kg	1	4/30/2020 3:53:11 PM	52164
Xylenes, Total	ND	0.094		mg/Kg	1	4/30/2020 3:53:11 PM	52164
Surr: 1,2-Dichloroethane-d4	80.0	70-130		%Rec	1	4/30/2020 3:53:11 PM	52164
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	4/30/2020 3:53:11 PM	52164
Surr: Dibromofluoromethane	91.0	70-130		%Rec	1	4/30/2020 3:53:11 PM	52164
Surr: Toluene-d8	94.8	70-130		%Rec	1	4/30/2020 3:53:11 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-004 **Matrix:** SOIL

Client Sample ID: SS20-04 0'
Collection Date: 4/27/2020 1:30:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	59		mg/Kg	20	5/1/2020 7:17:42 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/30/2020 4:21:42 PM	52164
Surr: BFB	100	70-130		%Rec	1	4/30/2020 4:21:42 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/1/2020 12:20:20 PM	52196
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/1/2020 12:20:20 PM	52196
Surr: DNOP	87.0	55.1-146		%Rec	1	5/1/2020 12:20:20 PM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	4/30/2020 4:21:42 PM	52164
Toluene	ND	0.049		mg/Kg	1	4/30/2020 4:21:42 PM	52164
Ethylbenzene	ND	0.049		mg/Kg	1	4/30/2020 4:21:42 PM	52164
Xylenes, Total	ND	0.098		mg/Kg	1	4/30/2020 4:21:42 PM	52164
Surr: 1,2-Dichloroethane-d4	78.9	70-130		%Rec	1	4/30/2020 4:21:42 PM	52164
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	4/30/2020 4:21:42 PM	52164
Surr: Dibromofluoromethane	88.2	70-130		%Rec	1	4/30/2020 4:21:42 PM	52164
Surr: Toluene-d8	94.5	70-130		%Rec	1	4/30/2020 4:21:42 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-005 **Matrix:** SOIL

Client Sample ID: SS20-05 0'
Collection Date: 4/27/2020 1:39:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	60		mg/Kg	20	5/1/2020 7:30:07 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/30/2020 4:50:13 PM	52164
Surr: BFB	101	70-130		%Rec	1	4/30/2020 4:50:13 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/1/2020 12:44:36 PM	52196
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/1/2020 12:44:36 PM	52196
Surr: DNOP	90.6	55.1-146		%Rec	1	5/1/2020 12:44:36 PM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/30/2020 4:50:13 PM	52164
Toluene	ND	0.050		mg/Kg	1	4/30/2020 4:50:13 PM	52164
Ethylbenzene	ND	0.050		mg/Kg	1	4/30/2020 4:50:13 PM	52164
Xylenes, Total	ND	0.10		mg/Kg	1	4/30/2020 4:50:13 PM	52164
Surr: 1,2-Dichloroethane-d4	78.0	70-130		%Rec	1	4/30/2020 4:50:13 PM	52164
Surr: 4-Bromofluorobenzene	99.6	70-130		%Rec	1	4/30/2020 4:50:13 PM	52164
Surr: Dibromofluoromethane	88.6	70-130		%Rec	1	4/30/2020 4:50:13 PM	52164
Surr: Toluene-d8	94.3	70-130		%Rec	1	4/30/2020 4:50:13 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-006 **Matrix:** SOIL

Client Sample ID: BH20-01 0'
Collection Date: 4/27/2020 2:01:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**MRA**
Chloride	1600	60		mg/Kg	20	5/1/2020 7:42:32 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/30/2020 5:18:45 PM	52164
Surr: BFB	99.3	70-130		%Rec	1	4/30/2020 5:18:45 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	10	9.7		mg/Kg	1	5/1/2020 1:36:44 PM	52196
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/1/2020 1:36:44 PM	52196
Surr: DNOP	94.9	55.1-146		%Rec	1	5/1/2020 1:36:44 PM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**DJF**
Benzene	ND	0.025		mg/Kg	1	4/30/2020 5:18:45 PM	52164
Toluene	ND	0.050		mg/Kg	1	4/30/2020 5:18:45 PM	52164
Ethylbenzene	ND	0.050		mg/Kg	1	4/30/2020 5:18:45 PM	52164
Xylenes, Total	ND	0.099		mg/Kg	1	4/30/2020 5:18:45 PM	52164
Surr: 1,2-Dichloroethane-d4	78.2	70-130		%Rec	1	4/30/2020 5:18:45 PM	52164
Surr: 4-Bromofluorobenzene	96.1	70-130		%Rec	1	4/30/2020 5:18:45 PM	52164
Surr: Dibromofluoromethane	90.3	70-130		%Rec	1	4/30/2020 5:18:45 PM	52164
Surr: Toluene-d8	93.6	70-130		%Rec	1	4/30/2020 5:18:45 PM	52164

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

Qualifiers:

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

Analytical Report
Lab Order **2004B73**
Date Reported: **5/4/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Federal 2
Lab ID: 2004B73-007 **Matrix:** SOIL

Client Sample ID: BH20-02 1.5'
Collection Date: 4/27/2020 2:18:00 PM
Received Date: 4/29/2020 10:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**MRA**
Chloride	ND	60		mg/Kg	20	5/1/2020 7:54:56 PM	52216
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/30/2020 5:47:16 PM	52164
Surr: BFB	97.3	70-130		%Rec	1	4/30/2020 5:47:16 PM	52164
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	5/1/2020 2:01:17 PM	52196
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	5/1/2020 2:01:17 PM	52196
Surr: DNOP	92.5	55.1-146		%Rec	1	5/1/2020 2:01:17 PM	52196
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**DJF**
Benzene	ND	0.025		mg/Kg	1	4/30/2020 5:47:16 PM	52164
Toluene	ND	0.050		mg/Kg	1	4/30/2020 5:47:16 PM	52164
Ethylbenzene	ND	0.050		mg/Kg	1	4/30/2020 5:47:16 PM	52164
Xylenes, Total	ND	0.10		mg/Kg	1	4/30/2020 5:47:16 PM	52164
Surr: 1,2-Dichloroethane-d4	76.6	70-130		%Rec	1	4/30/2020 5:47:16 PM	52164
Surr: 4-Bromofluorobenzene	98.5	70-130		%Rec	1	4/30/2020 5:47:16 PM	52164
Surr: Dibromofluoromethane	87.0	70-130		%Rec	1	4/30/2020 5:47:16 PM	52164
Surr: Toluene-d8	93.1	70-130		%Rec	1	4/30/2020 5:47:16 PM	52164

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

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 Quanitative 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#: **2004B73**

04-May-20

Client: Devon Energy

Project: Blackjack 1 Federal 2

Sample ID: **MB-52216**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **52216**	RunNo: **68572**							
Prep Date: **5/1/2020**	Analysis Date: **5/1/2020**	SeqNo: **2374259**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-52216**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **52216**	RunNo: **68572**							
Prep Date: **5/1/2020**	Analysis Date: **5/1/2020**	SeqNo: **2374260**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.4	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 Quanitative 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#: **2004B73**

04-May-20

Client: Devon Energy

Project: Blackjack 1 Federal 2

Sample ID: **LCS-52196** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **52196** RunNo: **68578**

Prep Date: **4/30/2020** Analysis Date: **5/1/2020** SeqNo: **2372791** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.5	70	130			
Surr: DNOP	4.5		5.000		89.2	55.1	146			

Sample ID: **MB-52196** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **52196** RunNo: **68578**

Prep Date: **4/30/2020** Analysis Date: **5/1/2020** SeqNo: **2372792** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.9		10.00		89.1	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 Quanitative 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#: **2004B73**
04-May-20

Client: Devon Energy
Project: Blackjack 1 Federal 2

Sample ID: **mb-52164** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **52164** RunNo: **68569**
Prep Date: **4/29/2020** Analysis Date: **4/30/2020** SeqNo: **2372327** Units: **mg/Kg**

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	0.39		0.5000		78.8	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		100	70	130			
Surr: Dibromofluoromethane	0.44		0.5000		88.4	70	130			
Surr: Toluene-d8	0.48		0.5000		95.7	70	130			

Sample ID: **lcs-52164** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **52164** RunNo: **68569**
Prep Date: **4/29/2020** Analysis Date: **4/30/2020** SeqNo: **2372328** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.025	1.000	0	83.2	80	120			
Toluene	0.93	0.050	1.000	0	92.9	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.8	80	120			
Xylenes, Total	3.0	0.10	3.000	0	98.4	80	120			
Surr: 1,2-Dichloroethane-d4	0.40		0.5000		80.1	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		97.9	70	130			
Surr: Dibromofluoromethane	0.44		0.5000		88.7	70	130			
Surr: Toluene-d8	0.45		0.5000		90.7	70	130			

Sample ID: **2004b73-001ams** SampType: **MS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **SS20-01 0'** Batch ID: **52164** RunNo: **68569**
Prep Date: **4/29/2020** Analysis Date: **4/30/2020** SeqNo: **2372359** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	0.9921	0	95.7	80	120			
Toluene	1.1	0.050	0.9921	0	110	80	120			
Ethylbenzene	1.1	0.050	0.9921	0	114	80	120			
Xylenes, Total	3.4	0.099	2.976	0	115	80	120			
Surr: 1,2-Dichloroethane-d4	0.39		0.4960		79.1	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.4960		97.7	70	130			
Surr: Dibromofluoromethane	0.45		0.4960		90.2	70	130			
Surr: Toluene-d8	0.45		0.4960		91.5	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 Quanitative 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#: **2004B73**
04-May-20

Client: Devon Energy
Project: Blackjack 1 Federal 2

Sample ID: **2004b73-001amsd** SampType: **MSD4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **SS20-01 0'** Batch ID: **52164** RunNo: **68569**
Prep Date: **4/29/2020** Analysis Date: **4/30/2020** SeqNo: **2372360** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.025	0.9980	0	90.2	80	120			
Toluene	1.1	0.050	0.9980	0	107	80	120			
Ethylbenzene	1.1	0.050	0.9980	0	114	80	120			
Xylenes, Total	3.4	0.10	2.994	0	114	80	120			
Surr: 1,2-Dichloroethane-d4	0.39		0.4990		79.0	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.4990		98.5	70	130			
Surr: Dibromofluoromethane	0.45		0.4990		91.0	70	130			
Surr: Toluene-d8	0.47		0.4990		94.2	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 Quanitative 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#: **2004B73**

04-May-20

Client: Devon Energy

Project: Blackjack 1 Federal 2

Sample ID: **mb-52164**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**							
Client ID: **PBS**	Batch ID: **52164**	RunNo: **68569**							
Prep Date: **4/29/2020**	Analysis Date: **4/30/2020**	SeqNo: **2372428**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		101	70	130			

Sample ID: **lcs-52164**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **52164**	RunNo: **68569**							
Prep Date: **4/29/2020**	Analysis Date: **4/30/2020**	SeqNo: **2372429**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.3	70	130			
Surr: BFB	500		500.0		101	70	130			

Sample ID: **2004b73-002ams**	SampType: **MS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**							
Client ID: **SS20-02 0'**	Batch ID: **52164**	RunNo: **68569**							
Prep Date: **4/29/2020**	Analysis Date: **4/30/2020**	SeqNo: **2372432**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	24.88	0	102	70	130			
Surr: BFB	490		497.5		97.6	70	130			

Sample ID: **2004b73-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D Mod: Gasoline Range**							
Client ID: **SS20-02 0'**	Batch ID: **52164**	RunNo: **68569**							
Prep Date: **4/29/2020**	Analysis Date: **4/30/2020**	SeqNo: **2372433**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	24.83	0	103	70	130	1.29	20	
Surr: BFB	490		496.5		99.5	70	130	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 Quanitative 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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: DEVON ENERGY Work Order Number: 2004B73 RcptNo: 1

Received By: Juan Rojas 4/29/2020 10:45:00 AM

Completed By: Isaiah Ortiz 4/29/2020 10:46:30 AM

Reviewed By: LB 4/29/20

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? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

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

Adjusted?

Checked by: SPA 4/29/20

Special Handling (if applicable)

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

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.1	Good	Not Present			

Chain-of-Custody Record

Client: Devon Energy

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 TAT
☒ Standard ☐ Rush

Project Name: Blackjack 1 Federal #2

Project #: 208447 02

Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 3.1+0=3.1 (°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. 2004873	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	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
4/27/20	12:08	Soil	SS20-01 0'	~~1EE~~ 4oz jar	ICE	-001	X	X					X			
X	12:31	X	SS20-02 0'	X	X	-002	X	X					X			
X	1:04	X	SS20-03 0'	X	X	-003	X	X					X			
X	1:30	X	SS20-04 0'	X	X	-004	X	X					X			
X	1:39	X	SS20-05 0'	X	X	-005	X	X					X			
X	2:01	X	BH20-01 0'	X	X	-006	X	X					X			
X	2:18	X	BH20-02 15'	X	X	-007	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
4/28/20	1330				4/28/20	1330
4/28/20	1900			courier	4/29/20	10:45

Remarks: Send report to Natalie Gordon
Direct Bill Devon

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

November 06, 2020

Natalie Gordon

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

RE: Blackjack 1 Fed 2 OrderNo.: 2010D75

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 27 sample(s) on 10/31/2020 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 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-001 **Matrix:** SOIL

Client Sample ID: BS20-01 3'
Collection Date: 10/29/2020 1:25:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 5:34:40 PM	56197
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 5:23:48 PM	56139
Surr: BFB	104	70-130		%Rec	1	11/2/2020 5:23:48 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	11/3/2020 10:43:35 AM	56144
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 10:43:35 AM	56144
Surr: DNOP	108	30.4-154		%Rec	1	11/3/2020 10:43:35 AM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 5:23:48 PM	56139
Toluene	ND	0.050		mg/Kg	1	11/2/2020 5:23:48 PM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 5:23:48 PM	56139
Xylenes, Total	ND	0.10		mg/Kg	1	11/2/2020 5:23:48 PM	56139
Surr: 1,2-Dichloroethane-d4	90.7	70-130		%Rec	1	11/2/2020 5:23:48 PM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 5:23:48 PM	56139
Surr: Dibromofluoromethane	108	70-130		%Rec	1	11/2/2020 5:23:48 PM	56139
Surr: Toluene-d8	99.5	70-130		%Rec	1	11/2/2020 5:23:48 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-002 **Matrix:** SOIL

Client Sample ID: BS20-02 3'
Collection Date: 10/29/2020 1:30:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 5:47:04 PM	56197
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 6:49:17 PM	56139
Surr: BFB	108	70-130		%Rec	1	11/2/2020 6:49:17 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	11/3/2020 11:07:46 AM	56144
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/3/2020 11:07:46 AM	56144
Surr: DNOP	100	30.4-154		%Rec	1	11/3/2020 11:07:46 AM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 6:49:17 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 6:49:17 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 6:49:17 PM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 6:49:17 PM	56139
Surr: 1,2-Dichloroethane-d4	93.6	70-130		%Rec	1	11/2/2020 6:49:17 PM	56139
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	11/2/2020 6:49:17 PM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/2/2020 6:49:17 PM	56139
Surr: Toluene-d8	104	70-130		%Rec	1	11/2/2020 6:49:17 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-003 **Matrix:** SOIL

Client Sample ID: BS20-03 2'
Collection Date: 10/29/2020 1:35:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 6:24:18 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 7:17:51 PM	56139
Surr: BFB	104	70-130		%Rec	1	11/2/2020 7:17:51 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	11/3/2020 11:31:51 AM	56144
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 11:31:51 AM	56144
Surr: DNOP	100	30.4-154		%Rec	1	11/3/2020 11:31:51 AM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 7:17:51 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 7:17:51 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 7:17:51 PM	56139
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 7:17:51 PM	56139
Surr: 1,2-Dichloroethane-d4	88.8	70-130		%Rec	1	11/2/2020 7:17:51 PM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 7:17:51 PM	56139
Surr: Dibromofluoromethane	105	70-130		%Rec	1	11/2/2020 7:17:51 PM	56139
Surr: Toluene-d8	101	70-130		%Rec	1	11/2/2020 7:17:51 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-004 **Matrix:** SOIL

Client Sample ID: BS20-04 2'
Collection Date: 10/29/2020 1:40:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 7:26:20 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 7:46:29 PM	56139
Surr: BFB	104	70-130		%Rec	1	11/2/2020 7:46:29 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	11/3/2020 11:55:45 AM	56144
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 11:55:45 AM	56144
Surr: DNOP	97.3	30.4-154		%Rec	1	11/3/2020 11:55:45 AM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 7:46:29 PM	56139
Toluene	ND	0.050		mg/Kg	1	11/2/2020 7:46:29 PM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 7:46:29 PM	56139
Xylenes, Total	ND	0.10		mg/Kg	1	11/2/2020 7:46:29 PM	56139
Surr: 1,2-Dichloroethane-d4	89.6	70-130		%Rec	1	11/2/2020 7:46:29 PM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 7:46:29 PM	56139
Surr: Dibromofluoromethane	108	70-130		%Rec	1	11/2/2020 7:46:29 PM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/2/2020 7:46:29 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-005 **Matrix:** SOIL

Client Sample ID: BS20-05 6"
Collection Date: 10/29/2020 1:45:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 8:03:33 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 8:15:07 PM	56139
Surr: BFB	108	70-130		%Rec	1	11/2/2020 8:15:07 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	11/3/2020 12:19:55 PM	56144
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/3/2020 12:19:55 PM	56144
Surr: DNOP	103	30.4-154		%Rec	1	11/3/2020 12:19:55 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	11/2/2020 8:15:07 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 8:15:07 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 8:15:07 PM	56139
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 8:15:07 PM	56139
Surr: 1,2-Dichloroethane-d4	96.3	70-130		%Rec	1	11/2/2020 8:15:07 PM	56139
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/2/2020 8:15:07 PM	56139
Surr: Dibromofluoromethane	110	70-130		%Rec	1	11/2/2020 8:15:07 PM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/2/2020 8:15:07 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-006 **Matrix:** SOIL

Client Sample ID: BS20-06 6"
Collection Date: 10/29/2020 1:50:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 8:15:57 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 8:43:44 PM	56139
Surr: BFB	107	70-130		%Rec	1	11/2/2020 8:43:44 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	11/3/2020 12:43:56 PM	56144
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	11/3/2020 12:43:56 PM	56144
Surr: DNOP	105	30.4-154		%Rec	1	11/3/2020 12:43:56 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 8:43:44 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 8:43:44 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 8:43:44 PM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 8:43:44 PM	56139
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	11/2/2020 8:43:44 PM	56139
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	11/2/2020 8:43:44 PM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/2/2020 8:43:44 PM	56139
Surr: Toluene-d8	103	70-130		%Rec	1	11/2/2020 8:43:44 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-007 **Matrix:** SOIL

Client Sample ID: BS20-07 6"
Collection Date: 10/29/2020 1:55:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 8:28:22 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 9:12:21 PM	56139
Surr: BFB	108	70-130		%Rec	1	11/2/2020 9:12:21 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	11/3/2020 1:08:03 PM	56144
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	11/3/2020 1:08:03 PM	56144
Surr: DNOP	83.8	30.4-154		%Rec	1	11/3/2020 1:08:03 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	11/2/2020 9:12:21 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 9:12:21 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 9:12:21 PM	56139
Xylenes, Total	ND	0.097		mg/Kg	1	11/2/2020 9:12:21 PM	56139
Surr: 1,2-Dichloroethane-d4	90.5	70-130		%Rec	1	11/2/2020 9:12:21 PM	56139
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/2/2020 9:12:21 PM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/2/2020 9:12:21 PM	56139
Surr: Toluene-d8	100	70-130		%Rec	1	11/2/2020 9:12:21 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-008 **Matrix:** SOIL

Client Sample ID: BS20-08 6"
Collection Date: 10/29/2020 2:00:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 8:40:47 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 9:40:58 PM	56139
Surr: BFB	102	70-130		%Rec	1	11/2/2020 9:40:58 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/3/2020 1:32:14 PM	56144
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 1:32:14 PM	56144
Surr: DNOP	101	30.4-154		%Rec	1	11/3/2020 1:32:14 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	11/2/2020 9:40:58 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 9:40:58 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 9:40:58 PM	56139
Xylenes, Total	ND	0.097		mg/Kg	1	11/2/2020 9:40:58 PM	56139
Surr: 1,2-Dichloroethane-d4	87.9	70-130		%Rec	1	11/2/2020 9:40:58 PM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 9:40:58 PM	56139
Surr: Dibromofluoromethane	104	70-130		%Rec	1	11/2/2020 9:40:58 PM	56139
Surr: Toluene-d8	104	70-130		%Rec	1	11/2/2020 9:40:58 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-009 **Matrix:** SOIL

Client Sample ID: BS20-09 6"
Collection Date: 10/29/2020 2:05:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	59		mg/Kg	20	11/4/2020 8:53:12 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 10:09:37 PM	56139
Surr: BFB	106	70-130		%Rec	1	11/2/2020 10:09:37 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	12	8.9		mg/Kg	1	11/3/2020 1:56:35 PM	56144
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	11/3/2020 1:56:35 PM	56144
Surr: DNOP	113	30.4-154		%Rec	1	11/3/2020 1:56:35 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 10:09:37 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 10:09:37 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 10:09:37 PM	56139
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 10:09:37 PM	56139
Surr: 1,2-Dichloroethane-d4	88.1	70-130		%Rec	1	11/2/2020 10:09:37 PM	56139
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/2/2020 10:09:37 PM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/2/2020 10:09:37 PM	56139
Surr: Toluene-d8	99.5	70-130		%Rec	1	11/2/2020 10:09:37 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-010 **Matrix:** SOIL

Client Sample ID: BS20-10 6"
Collection Date: 10/29/2020 2:10:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	61		mg/Kg	20	11/4/2020 9:30:26 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 10:38:11 PM	56139
Surr: BFB	107	70-130		%Rec	1	11/2/2020 10:38:11 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	11/3/2020 2:20:51 PM	56144
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 2:20:51 PM	56144
Surr: DNOP	92.9	30.4-154		%Rec	1	11/3/2020 2:20:51 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 10:38:11 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 10:38:11 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 10:38:11 PM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 10:38:11 PM	56139
Surr: 1,2-Dichloroethane-d4	91.4	70-130		%Rec	1	11/2/2020 10:38:11 PM	56139
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	11/2/2020 10:38:11 PM	56139
Surr: Dibromofluoromethane	100	70-130		%Rec	1	11/2/2020 10:38:11 PM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/2/2020 10:38:11 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-011 **Matrix:** SOIL

Client Sample ID: BS20-11 6"
Collection Date: 10/29/2020 2:15:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	59		mg/Kg	20	11/4/2020 9:42:51 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 11:06:41 PM	56139
Surr: BFB	104	70-130		%Rec	1	11/2/2020 11:06:41 PM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	10	8.5		mg/Kg	1	11/3/2020 2:45:12 PM	56144
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	11/3/2020 2:45:12 PM	56144
Surr: DNOP	97.5	30.4-154		%Rec	1	11/3/2020 2:45:12 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 11:06:41 PM	56139
Toluene	ND	0.049		mg/Kg	1	11/2/2020 11:06:41 PM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 11:06:41 PM	56139
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 11:06:41 PM	56139
Surr: 1,2-Dichloroethane-d4	97.0	70-130		%Rec	1	11/2/2020 11:06:41 PM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 11:06:41 PM	56139
Surr: Dibromofluoromethane	110	70-130		%Rec	1	11/2/2020 11:06:41 PM	56139
Surr: Toluene-d8	103	70-130		%Rec	1	11/2/2020 11:06:41 PM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-012 **Matrix:** SOIL

Client Sample ID: BS20-12 6"
Collection Date: 10/29/2020 2:20:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 9:55:16 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/3/2020 1:29:28 AM	56139
Surr: BFB	105	70-130		%Rec	1	11/3/2020 1:29:28 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	11/3/2020 3:09:27 PM	56144
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 3:09:27 PM	56144
Surr: DNOP	102	30.4-154		%Rec	1	11/3/2020 3:09:27 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 1:29:28 AM	56139
Toluene	ND	0.049		mg/Kg	1	11/3/2020 1:29:28 AM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/3/2020 1:29:28 AM	56139
Xylenes, Total	ND	0.098		mg/Kg	1	11/3/2020 1:29:28 AM	56139
Surr: 1,2-Dichloroethane-d4	92.2	70-130		%Rec	1	11/3/2020 1:29:28 AM	56139
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	11/3/2020 1:29:28 AM	56139
Surr: Dibromofluoromethane	105	70-130		%Rec	1	11/3/2020 1:29:28 AM	56139
Surr: Toluene-d8	101	70-130		%Rec	1	11/3/2020 1:29:28 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-013 **Matrix:** SOIL

Client Sample ID: BS20-13 6"
Collection Date: 10/29/2020 2:25:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 10:07:40 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 1:57:57 AM	56139
Surr: BFB	98.4	70-130		%Rec	1	11/3/2020 1:57:57 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	11/3/2020 3:33:48 PM	56144
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 3:33:48 PM	56144
Surr: DNOP	87.8	30.4-154		%Rec	1	11/3/2020 3:33:48 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 1:57:57 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 1:57:57 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 1:57:57 AM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/3/2020 1:57:57 AM	56139
Surr: 1,2-Dichloroethane-d4	93.2	70-130		%Rec	1	11/3/2020 1:57:57 AM	56139
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	11/3/2020 1:57:57 AM	56139
Surr: Dibromofluoromethane	111	70-130		%Rec	1	11/3/2020 1:57:57 AM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/3/2020 1:57:57 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-014 **Matrix:** SOIL

Client Sample ID: BS20-14 6"
Collection Date: 10/29/2020 2:30:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 10:20:05 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 2:26:34 AM	56139
Surr: BFB	104	70-130		%Rec	1	11/3/2020 2:26:34 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	11/3/2020 3:58:03 PM	56144
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	11/3/2020 3:58:03 PM	56144
Surr: DNOP	81.6	30.4-154		%Rec	1	11/3/2020 3:58:03 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 2:26:34 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 2:26:34 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 2:26:34 AM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/3/2020 2:26:34 AM	56139
Surr: 1,2-Dichloroethane-d4	96.2	70-130		%Rec	1	11/3/2020 2:26:34 AM	56139
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	11/3/2020 2:26:34 AM	56139
Surr: Dibromofluoromethane	110	70-130		%Rec	1	11/3/2020 2:26:34 AM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/3/2020 2:26:34 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-015 **Matrix:** SOIL

Client Sample ID: BS20-15 6"
Collection Date: 10/29/2020 2:35:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 10:32:29 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 2:55:09 AM	56139
Surr: BFB	103	70-130		%Rec	1	11/3/2020 2:55:09 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	11/3/2020 4:46:39 PM	56144
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	11/3/2020 4:46:39 PM	56144
Surr: DNOP	93.1	30.4-154		%Rec	1	11/3/2020 4:46:39 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 2:55:09 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 2:55:09 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 2:55:09 AM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/3/2020 2:55:09 AM	56139
Surr: 1,2-Dichloroethane-d4	89.7	70-130		%Rec	1	11/3/2020 2:55:09 AM	56139
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	11/3/2020 2:55:09 AM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/3/2020 2:55:09 AM	56139
Surr: Toluene-d8	101	70-130		%Rec	1	11/3/2020 2:55:09 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-016 **Matrix:** SOIL

Client Sample ID: BS20-16 6"
Collection Date: 10/29/2020 2:40:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	180	60		mg/Kg	20	11/4/2020 10:44:54 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/3/2020 3:23:42 AM	56139
Surr: BFB	108	70-130		%Rec	1	11/3/2020 3:23:42 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/3/2020 5:10:57 PM	56144
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 5:10:57 PM	56144
Surr: DNOP	84.8	30.4-154		%Rec	1	11/3/2020 5:10:57 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 3:23:42 AM	56139
Toluene	ND	0.049		mg/Kg	1	11/3/2020 3:23:42 AM	56139
Ethylbenzene	ND	0.049		mg/Kg	1	11/3/2020 3:23:42 AM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/3/2020 3:23:42 AM	56139
Surr: 1,2-Dichloroethane-d4	91.5	70-130		%Rec	1	11/3/2020 3:23:42 AM	56139
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	11/3/2020 3:23:42 AM	56139
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/3/2020 3:23:42 AM	56139
Surr: Toluene-d8	104	70-130		%Rec	1	11/3/2020 3:23:42 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-017 **Matrix:** SOIL

Client Sample ID: BS20-17 6"
Collection Date: 10/29/2020 2:45:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/4/2020 10:57:19 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 3:52:13 AM	56139
Surr: BFB	105	70-130		%Rec	1	11/3/2020 3:52:13 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	11/3/2020 5:35:10 PM	56144
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	11/3/2020 5:35:10 PM	56144
Surr: DNOP	88.0	30.4-154		%Rec	1	11/3/2020 5:35:10 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 3:52:13 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 3:52:13 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 3:52:13 AM	56139
Xylenes, Total	ND	0.099		mg/Kg	1	11/3/2020 3:52:13 AM	56139
Surr: 1,2-Dichloroethane-d4	95.2	70-130		%Rec	1	11/3/2020 3:52:13 AM	56139
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/3/2020 3:52:13 AM	56139
Surr: Dibromofluoromethane	110	70-130		%Rec	1	11/3/2020 3:52:13 AM	56139
Surr: Toluene-d8	102	70-130		%Rec	1	11/3/2020 3:52:13 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-018 **Matrix:** SOIL

Client Sample ID: BS20-18 6"
Collection Date: 10/29/2020 2:50:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	230	60		mg/Kg	20	11/4/2020 11:09:44 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 4:20:44 AM	56139
Surr: BFB	106	70-130		%Rec	1	11/3/2020 4:20:44 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	11/3/2020 5:59:33 PM	56144
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 5:59:33 PM	56144
Surr: DNOP	77.9	30.4-154		%Rec	1	11/3/2020 5:59:33 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 4:20:44 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 4:20:44 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 4:20:44 AM	56139
Xylenes, Total	ND	0.10		mg/Kg	1	11/3/2020 4:20:44 AM	56139
Surr: 1,2-Dichloroethane-d4	91.1	70-130		%Rec	1	11/3/2020 4:20:44 AM	56139
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/3/2020 4:20:44 AM	56139
Surr: Dibromofluoromethane	104	70-130		%Rec	1	11/3/2020 4:20:44 AM	56139
Surr: Toluene-d8	104	70-130		%Rec	1	11/3/2020 4:20:44 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-019 **Matrix:** SOIL

Client Sample ID: BS20-19 6"
Collection Date: 10/29/2020 2:55:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	61		mg/Kg	20	11/4/2020 11:22:08 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/3/2020 4:49:21 AM	56139
Surr: BFB	107	70-130		%Rec	1	11/3/2020 4:49:21 AM	56139
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	11/3/2020 6:23:42 PM	56144
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/3/2020 6:23:42 PM	56144
Surr: DNOP	71.5	30.4-154		%Rec	1	11/3/2020 6:23:42 PM	56144
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/3/2020 4:49:21 AM	56139
Toluene	ND	0.050		mg/Kg	1	11/3/2020 4:49:21 AM	56139
Ethylbenzene	ND	0.050		mg/Kg	1	11/3/2020 4:49:21 AM	56139
Xylenes, Total	ND	0.10		mg/Kg	1	11/3/2020 4:49:21 AM	56139
Surr: 1,2-Dichloroethane-d4	94.8	70-130		%Rec	1	11/3/2020 4:49:21 AM	56139
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	11/3/2020 4:49:21 AM	56139
Surr: Dibromofluoromethane	105	70-130		%Rec	1	11/3/2020 4:49:21 AM	56139
Surr: Toluene-d8	105	70-130		%Rec	1	11/3/2020 4:49:21 AM	56139

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-020 **Matrix:** SOIL

Client Sample ID: BS20-20 6"
Collection Date: 10/29/2020 3:00:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	59		mg/Kg	20	11/4/2020 11:59:22 PM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 2:46:26 PM	56140
Surr: BFB	99.7	70-130		%Rec	1	11/2/2020 2:46:26 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	16	9.9		mg/Kg	1	11/3/2020 7:36:07 PM	56145
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 7:36:07 PM	56145
Surr: DNOP	107	30.4-154		%Rec	1	11/3/2020 7:36:07 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 2:46:26 PM	56140
Toluene	ND	0.050		mg/Kg	1	11/2/2020 2:46:26 PM	56140
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 2:46:26 PM	56140
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 2:46:26 PM	56140
Surr: 1,2-Dichloroethane-d4	96.0	70-130		%Rec	1	11/2/2020 2:46:26 PM	56140
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/2/2020 2:46:26 PM	56140
Surr: Dibromofluoromethane	95.8	70-130		%Rec	1	11/2/2020 2:46:26 PM	56140
Surr: Toluene-d8	101	70-130		%Rec	1	11/2/2020 2:46:26 PM	56140

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

Qualifiers:

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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-021 **Matrix:** SOIL

Client Sample ID: WS20-01 0-3'
Collection Date: 10/29/2020 3:05:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/5/2020 12:11:46 AM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 4:07:58 PM	56140
Surr: BFB	99.5	70-130		%Rec	1	11/2/2020 4:07:58 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/3/2020 8:48:17 PM	56145
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 8:48:17 PM	56145
Surr: DNOP	107	30.4-154		%Rec	1	11/3/2020 8:48:17 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 4:07:58 PM	56140
Toluene	ND	0.050		mg/Kg	1	11/2/2020 4:07:58 PM	56140
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 4:07:58 PM	56140
Xylenes, Total	ND	0.10		mg/Kg	1	11/2/2020 4:07:58 PM	56140
Surr: 1,2-Dichloroethane-d4	94.1	70-130		%Rec	1	11/2/2020 4:07:58 PM	56140
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	11/2/2020 4:07:58 PM	56140
Surr: Dibromofluoromethane	93.8	70-130		%Rec	1	11/2/2020 4:07:58 PM	56140
Surr: Toluene-d8	96.8	70-130		%Rec	1	11/2/2020 4:07:58 PM	56140

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

Qualifiers:

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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-022 **Matrix:** SOIL

Client Sample ID: WS20-02 0-2'
Collection Date: 10/29/2020 3:10:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	59		mg/Kg	20	11/5/2020 12:24:11 AM	56214
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 8:43:38 PM	56140
Surr: BFB	97.7	70-130		%Rec	1	11/2/2020 8:43:38 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	11/3/2020 9:12:24 PM	56145
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 9:12:24 PM	56145
Surr: DNOP	89.3	30.4-154		%Rec	1	11/3/2020 9:12:24 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 8:43:38 PM	56140
Toluene	ND	0.049		mg/Kg	1	11/2/2020 8:43:38 PM	56140
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 8:43:38 PM	56140
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 8:43:38 PM	56140
Surr: 1,2-Dichloroethane-d4	95.2	70-130		%Rec	1	11/2/2020 8:43:38 PM	56140
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 8:43:38 PM	56140
Surr: Dibromofluoromethane	97.8	70-130		%Rec	1	11/2/2020 8:43:38 PM	56140
Surr: Toluene-d8	95.5	70-130		%Rec	1	11/2/2020 8:43:38 PM	56140

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-023 **Matrix:** SOIL

Client Sample ID: WS20-03 0-6"
Collection Date: 10/29/2020 3:15:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/5/2020 12:00:56 PM	56226
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 9:10:56 PM	56140
Surr: BFB	98.5	70-130		%Rec	1	11/2/2020 9:10:56 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	11/3/2020 9:36:19 PM	56145
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/3/2020 9:36:19 PM	56145
Surr: DNOP	77.5	30.4-154		%Rec	1	11/3/2020 9:36:19 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 9:10:56 PM	56140
Toluene	ND	0.049		mg/Kg	1	11/2/2020 9:10:56 PM	56140
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 9:10:56 PM	56140
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 9:10:56 PM	56140
Surr: 1,2-Dichloroethane-d4	94.2	70-130		%Rec	1	11/2/2020 9:10:56 PM	56140
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	11/2/2020 9:10:56 PM	56140
Surr: Dibromofluoromethane	97.2	70-130		%Rec	1	11/2/2020 9:10:56 PM	56140
Surr: Toluene-d8	95.3	70-130		%Rec	1	11/2/2020 9:10:56 PM	56140

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-024 **Matrix:** SOIL

Client Sample ID: WS20-04 0-6"
Collection Date: 10/29/2020 3:20:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	59		mg/Kg	20	11/5/2020 12:13:20 PM	56226
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 9:38:11 PM	56140
Surr: BFB	95.6	70-130		%Rec	1	11/2/2020 9:38:11 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/3/2020 10:00:23 PM	56145
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	11/3/2020 10:00:23 PM	56145
Surr: DNOP	91.7	30.4-154		%Rec	1	11/3/2020 10:00:23 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 9:38:11 PM	56140
Toluene	ND	0.050		mg/Kg	1	11/2/2020 9:38:11 PM	56140
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 9:38:11 PM	56140
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 9:38:11 PM	56140
Surr: 1,2-Dichloroethane-d4	93.8	70-130		%Rec	1	11/2/2020 9:38:11 PM	56140
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	11/2/2020 9:38:11 PM	56140
Surr: Dibromofluoromethane	97.6	70-130		%Rec	1	11/2/2020 9:38:11 PM	56140
Surr: Toluene-d8	95.1	70-130		%Rec	1	11/2/2020 9:38:11 PM	56140

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-025 **Matrix:** SOIL

Client Sample ID: WS20-05 0-6"
Collection Date: 10/29/2020 3:25:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/5/2020 12:25:44 PM	56226
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 10:05:25 PM	56140
Surr: BFB	97.8	70-130		%Rec	1	11/2/2020 10:05:25 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/3/2020 10:24:22 PM	56145
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/3/2020 10:24:22 PM	56145
Surr: DNOP	106	30.4-154		%Rec	1	11/3/2020 10:24:22 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 10:05:25 PM	56140
Toluene	ND	0.049		mg/Kg	1	11/2/2020 10:05:25 PM	56140
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 10:05:25 PM	56140
Xylenes, Total	ND	0.098		mg/Kg	1	11/2/2020 10:05:25 PM	56140
Surr: 1,2-Dichloroethane-d4	91.6	70-130		%Rec	1	11/2/2020 10:05:25 PM	56140
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/2/2020 10:05:25 PM	56140
Surr: Dibromofluoromethane	95.9	70-130		%Rec	1	11/2/2020 10:05:25 PM	56140
Surr: Toluene-d8	95.5	70-130		%Rec	1	11/2/2020 10:05:25 PM	56140

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-026 **Matrix:** SOIL

Client Sample ID: WS20-06 0-6"
Collection Date: 10/29/2020 3:30:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	60		mg/Kg	20	11/5/2020 12:38:08 PM	56226
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/2/2020 10:32:39 PM	56140
Surr: BFB	99.0	70-130		%Rec	1	11/2/2020 10:32:39 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	11/3/2020 10:48:25 PM	56145
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/3/2020 10:48:25 PM	56145
Surr: DNOP	98.9	30.4-154		%Rec	1	11/3/2020 10:48:25 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 10:32:39 PM	56140
Toluene	ND	0.050		mg/Kg	1	11/2/2020 10:32:39 PM	56140
Ethylbenzene	ND	0.050		mg/Kg	1	11/2/2020 10:32:39 PM	56140
Xylenes, Total	ND	0.10		mg/Kg	1	11/2/2020 10:32:39 PM	56140
Surr: 1,2-Dichloroethane-d4	94.1	70-130		%Rec	1	11/2/2020 10:32:39 PM	56140
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	11/2/2020 10:32:39 PM	56140
Surr: Dibromofluoromethane	96.7	70-130		%Rec	1	11/2/2020 10:32:39 PM	56140
Surr: Toluene-d8	96.0	70-130		%Rec	1	11/2/2020 10:32:39 PM	56140

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

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 Quanitative 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

Analytical Report
Lab Order **2010D75**
Date Reported: **11/6/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Blackjack 1 Fed 2
Lab ID: 2010D75-027 **Matrix:** SOIL

Client Sample ID: WS20-07 0-6"
Collection Date: 10/29/2020 3:35:00 PM
Received Date: 10/31/2020 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	ND	61		mg/Kg	20	11/5/2020 12:50:33 PM	56226
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	11/2/2020 10:59:50 PM	56140
Surr: BFB	98.1	70-130		%Rec	1	11/2/2020 10:59:50 PM	56140
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	11/3/2020 11:12:16 PM	56145
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	11/3/2020 11:12:16 PM	56145
Surr: DNOP	93.4	30.4-154		%Rec	1	11/3/2020 11:12:16 PM	56145
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	11/2/2020 10:59:50 PM	56140
Toluene	ND	0.049		mg/Kg	1	11/2/2020 10:59:50 PM	56140
Ethylbenzene	ND	0.049		mg/Kg	1	11/2/2020 10:59:50 PM	56140
Xylenes, Total	ND	0.099		mg/Kg	1	11/2/2020 10:59:50 PM	56140
Surr: 1,2-Dichloroethane-d4	95.8	70-130		%Rec	1	11/2/2020 10:59:50 PM	56140
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	11/2/2020 10:59:50 PM	56140
Surr: Dibromofluoromethane	99.7	70-130		%Rec	1	11/2/2020 10:59:50 PM	56140
Surr: Toluene-d8	96.8	70-130		%Rec	1	11/2/2020 10:59:50 PM	56140

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

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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **MB-56197**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **56197**	RunNo: **73148**							
Prep Date: **11/4/2020**	Analysis Date: **11/4/2020**	SeqNo: **2572599**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-56197**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **56197**	RunNo: **73148**							
Prep Date: **11/4/2020**	Analysis Date: **11/4/2020**	SeqNo: **2572600**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.6	90	110			

Sample ID: **MB-56214**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **56214**	RunNo: **73148**							
Prep Date: **11/4/2020**	Analysis Date: **11/4/2020**	SeqNo: **2572630**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-56214**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **56214**	RunNo: **73148**							
Prep Date: **11/4/2020**	Analysis Date: **11/4/2020**	SeqNo: **2572631**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.5	90	110			

Sample ID: **MB-56226**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **56226**	RunNo: **73149**							
Prep Date: **11/5/2020**	Analysis Date: **11/5/2020**	SeqNo: **2573344**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-56226**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **56226**	RunNo: **73149**							
Prep Date: **11/5/2020**	Analysis Date: **11/5/2020**	SeqNo: **2573345**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.1	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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **2010D75-020AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-20 6"** Batch ID: **56145** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571121** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	9.8	48.83	15.91	82.5	15	184			
Surr: DNOP	3.7		4.883		75.8	30.4	154			

Sample ID: **2010D75-020AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-20 6"** Batch ID: **56145** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571122** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	57	9.9	49.26	15.91	84.2	15	184	2.08	23.9	
Surr: DNOP	4.1		4.926		83.3	30.4	154	0	0	

Sample ID: **LCS-56144** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **56144** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571134** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	55	10	50.00	0	110	70	130			
Surr: DNOP	5.5		5.000		110	30.4	154			

Sample ID: **LCS-56145** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **56145** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571135** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	107	70	130			
Surr: DNOP	4.2		5.000		84.1	30.4	154			

Sample ID: **MB-56144** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **56144** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571136** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	13		10.00		128	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 Quanitative 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#: **2010D75**
06-Nov-20

Client: Devon Energy
Project: Blackjack 1 Fed 2

Sample ID: **MB-56145** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **56145** RunNo: **73117**
Prep Date: **11/2/2020** Analysis Date: **11/3/2020** SeqNo: **2571137** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.2		10.00		91.8	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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **2010d75-020ams** SampType: **MS4** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **BS20-20 6"** Batch ID: **56140** RunNo: **73147**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572362** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9970	0	103	71.1	115			
Toluene	1.1	0.050	0.9970	0	108	79.6	132			
Ethylbenzene	1.1	0.050	0.9970	0	107	83.8	134			
Xylenes, Total	3.2	0.10	2.991	0	108	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.48		0.4985		96.3	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.4985		104	70	130			
Surr: Dibromofluoromethane	0.48		0.4985		95.7	70	130			
Surr: Toluene-d8	0.48		0.4985		96.2	70	130			

Sample ID: **2010d75-020amsd** SampType: **MSD4** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **BS20-20 6"** Batch ID: **56140** RunNo: **73147**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572364** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9960	0	102	71.1	115	1.30	20	
Toluene	1.1	0.050	0.9960	0	109	79.6	132	0.787	20	
Ethylbenzene	1.1	0.050	0.9960	0	108	83.8	134	0.498	20	
Xylenes, Total	3.3	0.10	2.988	0	109	82.4	132	1.15	20	
Surr: 1,2-Dichloroethane-d4	0.47		0.4980		94.7	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.52		0.4980		105	70	130	0	0	
Surr: Dibromofluoromethane	0.47		0.4980		95.3	70	130	0	0	
Surr: Toluene-d8	0.48		0.4980		97.3	70	130	0	0	

Sample ID: **lcs-56140** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **BatchQC** Batch ID: **56140** RunNo: **73147**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572387** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.4	80	120			
Toluene	1.0	0.050	1.000	0	101	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		94.8	70	130			
Surr: 4-Bromofluorobenzene	0.53		0.5000		106	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		97.9	70	130			
Surr: Toluene-d8	0.49		0.5000		98.9	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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **mb-56140** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **PBS** Batch ID: **56140** RunNo: **73147**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572388** Units: **mg/Kg**

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		93.7	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		107	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		94.6	70	130			
Surr: Toluene-d8	0.50		0.5000		99.5	70	130			

Sample ID: **lcs-56139** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **BatchQC** Batch ID: **56139** RunNo: **73158**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572746** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	93.9	80	120			
Toluene	1.1	0.050	1.000	0	108	80	120			
Ethylbenzene	1.1	0.050	1.000	0	109	80	120			
Xylenes, Total	3.4	0.10	3.000	0	113	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.5	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		103	70	130			
Surr: Toluene-d8	0.51		0.5000		101	70	130			

Sample ID: **mb-56139** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**

Client ID: **PBS** Batch ID: **56139** RunNo: **73158**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572747** Units: **mg/Kg**

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		90.6	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		103	70	130			
Surr: Toluene-d8	0.50		0.5000		101	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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **2010d75-021ams** SampType: **MS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **WS20-01 0-3'** Batch ID: **56140** RunNo: **73147**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572446** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	24.83	0	85.0	49.2	122			
Surr: BFB	480		496.5		96.4	70	130			

Sample ID: **2010d75-021amsd** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **WS20-01 0-3'** Batch ID: **56140** RunNo: **73147**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572447** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	24.95	0	82.6	49.2	122	2.27	20	
Surr: BFB	490		499.0		98.8	70	130	0	0	

Sample ID: **lcs-56140** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS** Batch ID: **56140** RunNo: **73147**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572458** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.6	70	130			
Surr: BFB	500		500.0		100	70	130			

Sample ID: **mb-56140** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **56140** RunNo: **73147**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572459** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		100	70	130			

Sample ID: **2010d75-001ams** SampType: **MS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-01 3'** Batch ID: **56139** RunNo: **73158**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572753** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	24.85	0	92.4	49.2	122			
Surr: BFB	510		497.0		102	70	130			

Sample ID: **2010d75-001amsd** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-01 3'** Batch ID: **56139** RunNo: **73158**
Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572754** Units: **mg/Kg**

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 Quanitative 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#: **2010D75**

06-Nov-20

Client: Devon Energy

Project: Blackjack 1 Fed 2

Sample ID: **2010d75-001amsd** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**

Client ID: **BS20-01 3'** Batch ID: **56139** RunNo: **73158**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572754** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.93	0	95.3	49.2	122	3.45	20	
Surr: BFB	540		498.5		108	70	130	0	0	

Sample ID: **lcs-56139** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**

Client ID: **LCSS** Batch ID: **56139** RunNo: **73158**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572773** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	91.3	70	130			
Surr: BFB	530		500.0		106	70	130			

Sample ID: **mb-56139** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**

Client ID: **PBS** Batch ID: **56139** RunNo: **73158**

Prep Date: **11/1/2020** Analysis Date: **11/2/2020** SeqNo: **2572774** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	530		500.0		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 Quanitative 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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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: **2010D75** RcptNo: 1

Received By: **Erin Melendrez** **10/31/2020 11:00:00 AM**

Completed By: **Erin Melendrez** **10/31/2020 11:25:44 AM**

Reviewed By: DF 10/31/2020

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. 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? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: ENM 10/31/20

Special Handling (if applicable)

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

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.1	Good				

Chain-of-Custody Record

Client: Devon Energy

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 TAT Rush
☒ Standard ☐ Rush

Project Name: Blackjack 1 Fed #2

Project #: 20844702

Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 3.0+0.1(CF)=3.1(°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. 2010D75	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_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/29/20	1:25	Soil	BS20-01 3'	4oz jar	ice	-001	X	X					X			
	1:30		BS20-02 3'			-002										
	1:35		BS20-03 2'			-003										
	1:40		BS20-04 2'			-004										
	1:45		BS20-05 6"			-005										
	1:50		BS20-06 6"			-006										
	1:55		BS20-07 6"			-007										
	2:00		BS20-08 6"			-008										
	2:05		BS20-09 6"			-009										
	2:10		BS20-10 6"			-010										
	2:15		BS20-11 6"			-011										
	2:20		BS20-12 6"			-012										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10/30/20	1400				10/30/20	1345
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10/30/20	1900			Courier	10/31/20	1100

Remarks: Send report to Natalie Gordon
Bill Devon Energy

Chain-of-Custody Record

Client: ~~on file~~ Devon Energy

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:
~~☒ Standard~~ ☐ Rush 5 Day TAT Rush

Project Name: Blackjack 1 Fed #2

Project #: 208847 02

Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 3.0+0.1(CF)=3.1(°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. 2010D75	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	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/29/20	2:25	soil	BS20-13 6"	4oz jar	ice	-013	X	X					X			
	2:30		BS20-14 6"			-014										
	2:35		BS20-15 6"			-015										
	2:40		BS20-16 6"			-016										
	2:45		BS20-17 6"			-017										
	2:50		BS20-18 6"			-018										
	2:55		BS20-19 6"			-019										
	3:00		BS20-20 6"			-020										
	3:05		WS20-01 0-3'			-021										
	3:10		WS20-02 0-2'			-022										
	3:15		WS20-03 0-6"			-023										
	3:20		WS20-04 0-6"			-024										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
10/30/20	1400				10/30/20	1400
10/30/20	1940			courier	10/31/20	1100

Remarks: Send report to Natalie Gordon
Bill Devon Energy

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

Client: Devon Energy

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 TAT Rush
~~☒ Standard~~ ☐ Rush

Project Name: Blackjack 1 Fed #2

Project #: 20844702

Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 3.0 +0.1(CF) = 3.1 (°C)

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

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2010D75	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	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/29/20	3:25	soil	WS20-05 0-6"	4 oz. jar	ice	-025	X	X					X			
"	3:30	"	WS20-06 0-6"	"	"	-026	"	"					"			
"	3:35	"	WS20-07 0-6"	"	"	-027	"	"					"			
"	3															

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
10/30/20	1400				10/30/20	1345
10/30/20	1900			Courier	10/31/20	1100

Remarks:
Send report to Natalie Gordon
Bill Devon

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.

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QUESTIONS

Action 388924

QUESTIONS

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 388924
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAB1721929878**
Incident Name	**NAB1721929878 BLACKJACK 1 FEDERAL #002 @ 30-015-33383**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Closure Report Received**
Incident Well	**[30-015-33383] BLACKJACK 1 FEDERAL #002**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	BLACKJACK 1 FEDERAL #002
Date Release Discovered	07/16/2017
Surface Owner	Federal

Incident Details	
Please answer all the questions in this group.	
Incident Type	Produced Water Release
Did this release result in a fire or is the result of a fire	No
Did this release result in any injuries	No
Has this release reached or does it have a reasonable probability of reaching a watercourse	No
Has this release endangered or does it have a reasonable probability of endangering public health	No
Has this release substantially damaged or will it substantially damage property or the environment	No
Is this release of a volume that is or may with reasonable probability be detrimental to fresh water	No

Nature and Volume of Release	
Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.	
Crude Oil Released (bbls) Details	Cause: Equipment Failure | Flow Line - Production | Crude Oil | Released: 1 BBL | Recovered: 0 BBL | Lost: 1 BBL.
Produced Water Released (bbls) Details	Cause: Equipment Failure | Flow Line - Production | Produced Water | Released: 7 BBL | Recovered: 5 BBL | Lost: 2 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
Condensate Released (bbls) Details	*Not answered.*
Natural Gas Vented (Mcf) Details	*Not answered.*
Natural Gas Flared (Mcf) Details	*Not answered.*
Other Released Details	*Not answered.*
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	*Not answered.*

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
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QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	**No, according to supplied volumes this does not appear to be a "gas only" report.**
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	**No**
Reasons why this would be considered a submission for a notification of a major release	*Unavailable.*
With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.	

Initial Response	
The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury.	
The source of the release has been stopped	True
The impacted area has been secured to protect human health and the environment	True
Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices	True
All free liquids and recoverable materials have been removed and managed appropriately	True
If all the actions described above have not been undertaken, explain why	*Not answered.*
Per Paragraph (4) of Subsection B of 19.15.29.8 NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of actions to date in the follow-up C-141 submission. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC), please prepare and attach all information needed for closure evaluation in the follow-up C-141 submission.	

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.

I hereby agree and sign off to the above statement	Name: Dale Woodall Title: EHS Professional Email: Dale.Woodall@dvn.com Date: 10/01/2024

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 388924
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Site Characterization	
Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). 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 in feet below ground surface (ft bgs)	Between 100 and 500 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Greater than 5 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 1 and 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Between 1 and 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between ½ and 1 (mi.)
Any other fresh water well or spring	Between 1 and 5 (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between ½ and 1 (mi.)
A subsurface mine	Greater than 5 (mi.)
An (non-karst) unstable area	Between 1 and 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Between 1 and 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	Yes

Remediation Plan	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
Requesting a remediation plan approval with this submission	Yes
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.	
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)	
Chloride (EPA 300.0 or SM4500 Cl B)	0
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	16
GRO+DRO (EPA SW-846 Method 8015M)	16
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
On what estimated date will the remediation commence	04/27/2020
On what date will (or did) the final sampling or liner inspection occur	10/29/2020
On what date will (or was) the remediation complete(d)	12/15/2020
What is the estimated surface area (in square feet) that will be reclaimed	2960
What is the estimated volume (in cubic yards) that will be reclaimed	300
What is the estimated surface area (in square feet) that will be remediated	2690
What is the estimated volume (in cubic yards) that will be remediated	300
These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.	
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

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	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Remediation Plan (continued)	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
(Select all answers below that apply.)	
(Ex Situ) Excavation and **off-site** disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for **off-site** disposal	R360 ARTESIA LLC LANDFARM [fEEM0112340644]
OR which OCD approved well (API) will be used for **off-site** disposal	*Not answered.*
OR is the **off-site** disposal site, to be used, out-of-state	*Not answered.*
OR is the **off-site** disposal site, to be used, an NMED facility	*Not answered.*
(Ex Situ) Excavation and **on-site** remediation (i.e. On-Site Land Farms)	*Not answered.*
(In Situ) Soil Vapor Extraction	*Not answered.*
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	*Not answered.*
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	*Not answered.*
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	*Not answered.*
Ground Water Abatement pursuant to 19.15.30 NMAC	*Not answered.*
OTHER (Non-listed remedial process)	*Not answered.*
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
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.	
I hereby agree and sign off to the above statement	Name: Dale Woodall Title: EHS Professional Email: Dale.Woodall@dvn.com Date: 10/01/2024
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 388924
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Deferral Requests Only	
Only answer the questions in this group if seeking a deferral upon approval this submission. Each of the following items must be confirmed as part of any request for deferral of remediation.	
Requesting a deferral of the remediation closure due date with the approval of this submission	No

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QUESTIONS (continued)

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	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	**388938**
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	**10/29/2020**
What was the (estimated) number of samples that were to be gathered	**28**
What was the sampling surface area in square feet	**2690**

Remediation Closure Request	
Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.	
Requesting a remediation closure approval with this submission	Yes
Have the lateral and vertical extents of contamination been fully delineated	**Yes**
Was this release entirely contained within a lined containment area	**No**
All areas reasonably needed for production or subsequent drilling operations have been stabilized, returned to the sites existing grade, and have a soil cover that prevents ponding of water, minimizing dust and erosion	Yes
What was the total surface area (in square feet) remediated	2690
What was the total volume (cubic yards) remediated	300
All areas not reasonably needed for production or subsequent drilling operations have been reclaimed to contain a minimum of four feet of non-waste contain earthen material with concentrations less than 600 mg/kg chlorides, 100 mg/kg TPH, 50 mg/kg BTEX, and 10 mg/kg Benzene	Yes
What was the total surface area (in square feet) reclaimed	2690
What was the total volume (in cubic yards) reclaimed	300
Summarize any additional remediation activities not included by answers (above)	SEE REPORT

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 (in .pdf format) 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.

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.

I hereby agree and sign off to the above statement	Name: Dale Woodall Title: EHS Professional Email: Dale.Woodall@dvn.com Date: 10/01/2024

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QUESTIONS (continued)

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	Action Number: 388924
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Reclamation Report	
Only answer the questions in this group if all reclamation steps have been completed.	
Requesting a reclamation approval with this submission	No

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CONDITIONS

Operator:	OGRID:
DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	6137
	Action Number: 388924
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	Remediation closure approved.	10/22/2024
amaxwell	A reclamation report will not be accepted until reclamation of the release area, including areas reasonably needed for production or drilling activities, is complete and meet the requirements of 19.15.29.13 NMAC. Areas not reasonably needed for production or drilling activities will still need to be reclaimed and revegetated as early as practicable.	10/22/2024
amaxwell	The reclamation report will need to include: Executive Summary of the reclamation activities; Scaled Site Map including sampling locations; Analytical results including, but not limited to, results showing that any remaining impacts meet the reclamation standards and results to prove the backfill is non-waste containing; At least one (1) representative 5-point composite sample will need to be collected from the backfill material that will be used for the reclamation of the top four feet of the excavation. OCD reserves the right to request additional sampling if needed; pictures of the backfilled areas showing that the area is back, as nearly as practical, to the original condition or the final land use and maintain those areas to control dust and minimize erosion to the extent practical; pictures of the top layer, which is either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater; and a revegetation plan.	10/22/2024