April 13, 2020 Vertex Project #: 20E-00141-023

Spill Closure Report: Big Cat 16 9 State Federal Com #001H
Unit E, Section 16, Township 23 South, Range 32 East
County: Lea
API: 30-025-43196
Tracking Number: NDHR1917147896

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

New Mexico Oil Conservation Division – District 1 – Hobbs
1625 North French Drive
Hobbs, New Mexico 88240

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a treated produced water release that occurred at Big Cat 16 9 State Federal Com #001H, API 30-025-43196 (hereafter referred to as "Big Cat"). Devon provided notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 1 and the New Mexico State Land Office (NM SLO), who owns the property, on May 22, 2019, via submission of an initial C-141 Release Notification (Attachment 1). The NM OCD tracking number for this incident is NDHR1917147896.

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 the NM OCD for closure of this release.

Incident Description

On May 15, 2019, a release occurred at Devon's Big Cat site when, during drilling activities, the discharge valve on a flowline pump was closed manually. This incident resulted in the release of approximately 219 barrels (bbls) of treated produced water into a pasture area off the wellpad. No free liquids were recovered. The spill was contained on land; no produced water was released into sensitive areas or waterways.

Site Characterization

The release at Big Cat occurred on New Mexico state-owned land, N 32.3047305, W 103.6881764, approximately 30 miles east of Carlsbad, New Mexico. The legal description for the site is Unit E, Section 16, Township 23 South, Range 32 East, Lea County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production, and rangeland. An aerial photograph and site schematic are included in Attachment 2.

Big Cat is typical of oil and gas exploration and production sites in the western portion of the Permian Basin, and is currently used for oil and gas production, and storage. The following sections specifically describe the release area off of the wellpad where the flowline was located.

The surrounding landscape is associated with sandy plains typical of elevations of 3,000 to 3,900 feet above sea level. The climate is semi-arid, with average annual precipitation ranging between 10 and 15 inches. Historically, the plant community has been dominated by grasses, with scattered shinnery oak and sand sage; perennial and annual forb abundance is dependent on precipitation. The dominant grass species are black grama, dropseeds and bluestems. Litter and, to a lesser extent, bare ground make up a significant proportion of the ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020).

The Geological Map of New Mexico indicates the surface geology at Big Cat is comprised of Qep – eolian and piedmont deposits, that include eolian sands interlayed with piedmont-slope deposits (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service (NRCS) *Web Soil Survey* characterizes the soil at the site as Maljamar and palomas fine sands, characterized by deep layers of fine sand and sandy clay loam over sandy loam. It tends to be well-drained with low runoff and 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 Big Cat, though some erosional karst is possible (United States Department of the Interior, United States Geological Survey, 2020a).

There is no surface water located on-site. A freshwater stock pond is located approximately 2 miles east-southeast of the release site (United States Fish and Wildlife Service, 2020). The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 16 miles east-southeast of the site (United States Department of the Interior, United States Geological Survey, 2020b). There are no continuously flowing watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features nearby as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest active well to the release site includes a New Mexico Office of the State Engineer (NM OSE) well, located approximately 1.4 miles southeast of the site, with a depth to groundwater of 400 feet below ground surface (bgs; New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2020). A *United States Geologic Survey* (USGS)-identified well from 2013, located approximately 2.1 miles northeast of the site, shows a depth to groundwater of approximately 490 feet bgs (United States Department of the Interior, United States Geological Survey, 2020c). 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.

Based on data included in the closure criteria determination worksheet, the release at Big Cat is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC and the closure criteria for the site are determined to be associated with the following constituent concentration limits based on depth to groundwater.

Table 1. Closure Criteria for Soils Impacted by a Release		
Depth to Groundwater	**Constituent**	**Limit**
>100 feet	Chloride	20,000 mg/kg
	TPH[1] (GRO + DRO + MRO)	2,500 mg/kg
	GRO + DRO	1,000 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

An initial spill inspection, completed on February 18, 2020, identified the location of the release. Vertex was on-site to attempt to delineate the release using field screening methods to determine potential chloride impacts resulting from the release. Small soil samples were collected from various locations around the area of the release and mixed with a pre-determined volume of distilled water to make a solution. An electrical conductivity (EC) meter was placed in the solution of distilled water and soil, and the displayed EC results were input into a regression equation to approximate the level of chlorides present in the soil. All field screening conducted across the release area returned EC levels equivalent to those expected in the background soils of this region. Field screening results are summarized in the Daily Field Report (DFR) associated with this initial inspection (Attachment 4).

As the initial soil sample field screening results from the potentially impacted area showed no indication of the presence of chlorides or other contaminants of concern, and based on the knowledge that the release consisted solely of treated produced water, no excavation or remediation of the area was deemed necessary. Vertex provided 48-hour notification of confirmation sampling to the NM OCD, as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC on February 18, 2020 (Attachment 5).

Confirmatory samples were collected on February 22, 2020. A total of eight five-point composite confirmatory samples were collected from the area of potential impact where this release occurred. The composite samples were placed into laboratory-provided containers, preserved on ice, and submitted to a National Environmental Laboratory Accreditation Program (NELAP)-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sample analytical data are summarized in 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 was used to map the approximate center of each of the five-point composite samples. The confirmatory sample locations are presented on Figure 1 (Attachment 2).

Closure Request

Vertex does not recommend any remediation action to address the release at Big Cat. Laboratory analyses of the confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where

depth to groundwater is greater than 100 feet bgs as shown in Table 1. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

Additionally, based on the location of the release off of the wellpad, a previously undisturbed area, NM OCD regulations require the release area to be restored to the condition that existed prior to the release and any disturbed areas reclaimed to the levels outlined in Paragraph (1) of Subsection D of 19.15.29.13 NMAC. As the area did not require remediation, the vegetation remains intact and appears healthy. Vertex requests that restoration and reclamation of the release area be considered complete per Paragraph (3) of Subsection D of 19.15.29.13 NMAC.

Vertex requests that this incident (NDHR1917147896) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Devon certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NM OCD requirements to obtain closure on the May 15, 2019, release at Big Cat.

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

Sincerely,

Natalie Gordon
PROJECT MANAGER

Attachments

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

References

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

New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2020). *Water Column/Average Depth to Water Report.* Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html

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

United States Department of Agriculture, Natural Resources Conservation Service. (2020). *Web Soil Survey*. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Department of the Interior, United States Geological Survey. (2020a). *Caves and Karst in the U.S. National Park Service*. Retrieved from https://www.arcgis.com/home/webmap/viewer.html?webmap=14675403c37948129acb758138f2dd1e

United States Department of the Interior, United States Geological Survey. (2020b). *The National Map: National Hydrography Dataset*. Retrieved from https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fbasemap.nationalmap.gov%2Farcgis%2Frest%2Fservices%2FUSGSHydroCached%2FMapServer&source=sd

United States Department of the Interior, United States Geological Survey. (2020c). *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

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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

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

Location of Release Source

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

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

Unit Letter	Section	Township	Range	County

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) 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		

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
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)?	

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: _____ Title: _____

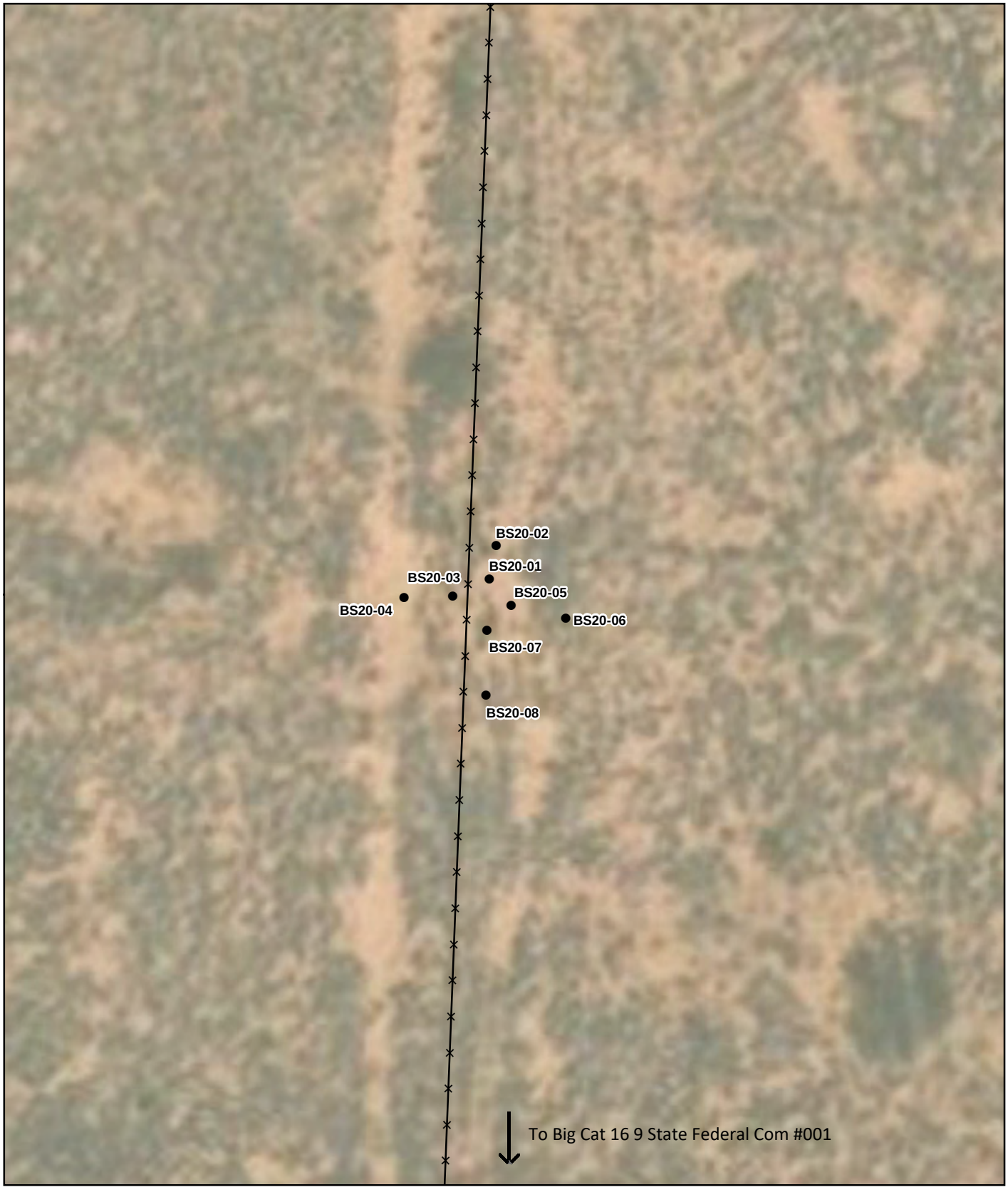
Signature: Kendra DeHoyos Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

ATTACHMENT 2



Confirmatory Sample

Fence

VERTEX

0 5 10 20 ft.

NAD 1983 UTM Zone 14N
Date: Feb 24/20

Map Center:
Lat: 32.304725,
Long:-103.688156

N

Site Schematic and Confirmatory Sample Locations
Big Cat 16 9 State Federal Com #001H

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: Background image from ESRI, 2019.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-00141\023 - Big Cat 16 9 Federal Com #001\Fig 2 Big Cat 16 9 Fed Com #001H Confirmatory Schematic (20E-00141).mxd

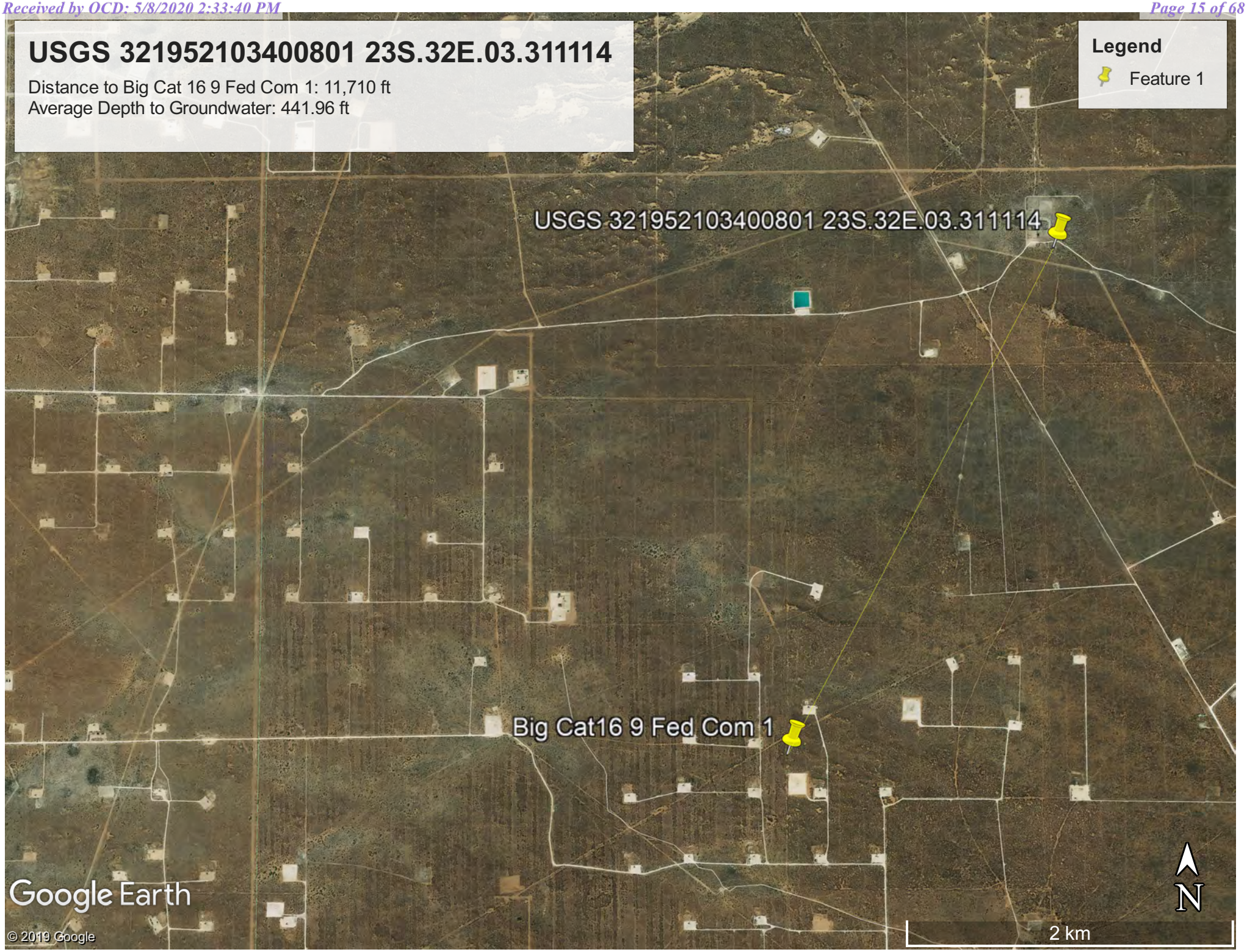
ATTACHMENT 3

Table 1. Closure Criteria Determination			
Site Name: Big Cat 16 9 Fed Com 1			
Spill Coordinates:		**X: 32.30470**	**Y: -103.68820**
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater	**400**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	29572	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	11719	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	34964	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**	7831	feet
	ii) Within 1000 feet of any fresh water well or spring		feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	20817	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)		Critical High Medium Low
10	Within a 100-year Floodplain	undetermined	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria		>100'	<50' 51-100' >100'

Column1
Critical
High
Medium
Low

Column1
Yes
No

<50'
51-100'
>100'


USGS 321952103400801 23S.32E.03.311114
Distance to Big Cat 16 9 Fed Com 1: 11,710 ft
Average Depth to Groundwater: 441.96 ft
Legend
Feature 1
USGS 321952103400801 23S.32E.03.311114
Big Cat16 9 Fed Com 1
Google Earth
© 2019 Google
N
2 km

National Water Information System: Web Interface

USGS Water Resources

Data Category: Site Information ▼ Geographic Area: United States ▼ GO

Click to hideNews Bulletins

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

USGS 321952103400801 23S.32E.03.311114

Available data for this site SUMMARY OF ALL AVAILABLE DATA ▼ GO

Well Site

DESCRIPTION:

Latitude 32°19'59.2", Longitude 103°40'12.6" NAD83
Lea County, New Mexico , Hydrologic Unit 13060011
Well depth: 630 feet
Land surface altitude: 3,648.00 feet above NGVD29.
Well completed in "Sunrise Formation" (231SNRS) local aquifer

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Field groundwater-level measurements	1976-12-09	2013-01-16	8
Revisions	Unavailable (site:0) (timeseries:0)		

OPERATION:

Record for this site is maintained by the USGS New Mexico Water Science Center
Email questions about this site to New Mexico Water Science Center Water-Data Inquiries

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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: NWIS Site Information for USA: Site Inventory
URL: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=321952103400801

Page Contact Information: New Mexico Water Data Support Team
Page Last Modified: 2020-02-13 09:19:12 EST
0.41 0.4 caww02

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum)

(R=POD has been replaced and no longer serves this file, C=the file is closed)

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 6416 4	Sec	Tws	Rng	X	Y	Distance
C 02216	CUB	PLS	11.3	BRININSTOOL XL RANCH LLC	LE	C 02216					2 2 4	21	23S	32E	625035	3573261*	2294
C 03851	CUB	MON	0	US DEPARTMENT OF ENERGY	LE	C 03851 POD1			NON	Artesian	3 3 4	20	23S	32E	622879	3572660	2387
C 02520	C	PRO	0	PENWELL ENERGY	LE	C 02520					1 4	15	23S	32E	626122	3574791*	2628
C 02349	CUB	STK	3	CHARLES F. JAMES	ED	C 02349					2 3	03	23S	32E	625678	3578004*	3738
C 03529	C	STK	0	U.S. DEPT. OF INTERIOR--BLM	LE	C 03529 POD1					2 4 3	29	23S	32E	622651	3571212	3848
C 02445	C	STK	3	THE JIMMY MILLS GST TRUST	LE	C 02445					3 3 3	13	23S	32E	628437	3574327*	4978

Record Count: 6

UTMNAD83 Radius Search (in meters):

Easting (X): 623499.66 **Northing (Y):** 3574965.83 **Radius:** 5000

Sorted by: Distance

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

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 02216	CUB	LE	2	2	4	21	23S	32E	625035	3573261*	2294	585	400	185
C 03851 POD1	CUB	LE	3	3	4	20	23S	32E	622880	3572660	2387	1392	713	679
C 02349	CUB	ED		2	3	03	23S	32E	625678	3578004*	3738	525		
C 03529 POD1	C	LE	2	4	3	29	23S	32E	622651	3571212	3848	550		

Average Depth to Water: **556 feet**

Minimum Depth: **400 feet**

Maximum Depth: **713 feet**

Record Count: 4

UTMNAD83 Radius Search (in meters):

Easting (X): 623499.66 **Northing (Y):** 3574965.83 **Radius:** 5000

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

New Mexico Office of the State Engineer
Wells with Well Log Information

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(in feet)

POD Number	POD Sub-basin Code	County	Source	q 6416	q 3	q 4	Sec	Tws	Rng	X	Y	Distance	Start Date	Finish Date	Log File Date	Depth Well	Depth Water	Driller	License Number
C 03851 POD1	CUB	LE	Artesian	3	3	4	20	23S	32E	622880	3572660	2387	08/19/2015	10/02/2015	11/10/2015	1392	713	STEWART, RANDAL P.	1723

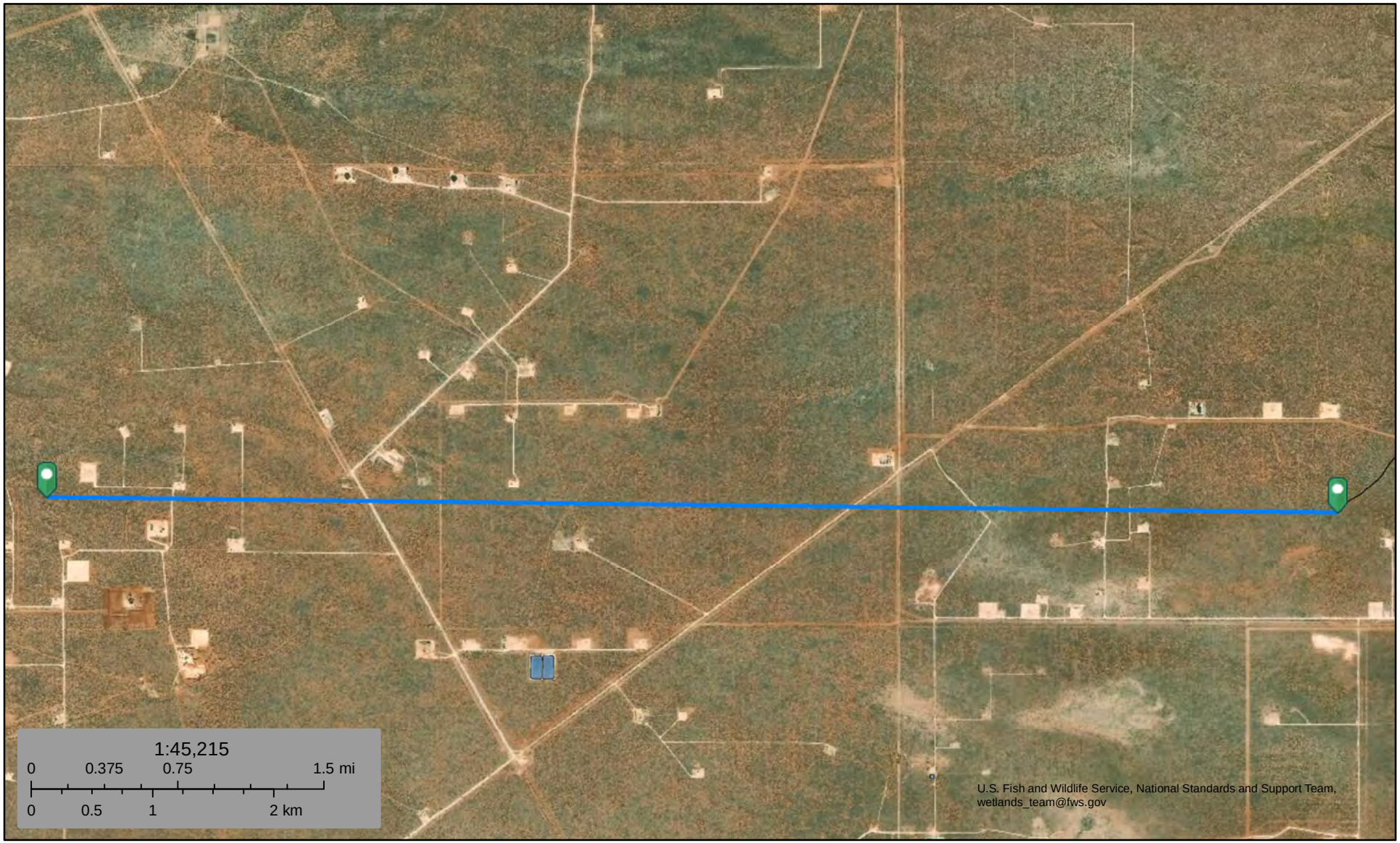
Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 623499.66 **Northing (Y):** 3574965.83 **Radius:** 5000

U.S. Fish and Wildlife Service
National Wetlands Inventory

Big Cat: Watercourse 29,572 ft



February 9, 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.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Big Cat 16 9 Fed Com 1: Pond 11,719 ft

February 9, 2020

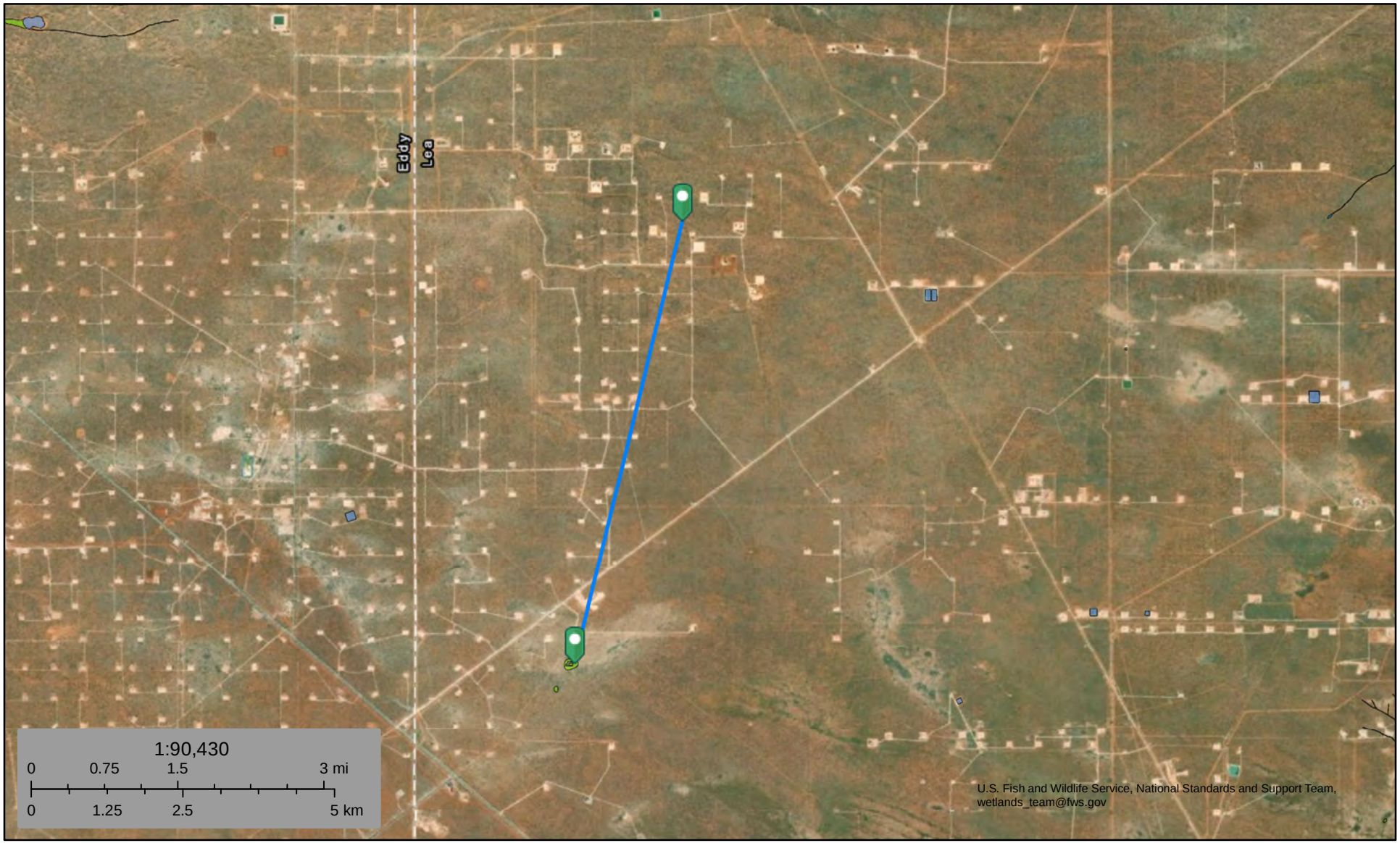
Wetlands

- 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.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Big Cat: Wetland 20,817 ft



February 9, 2020

Wetlands

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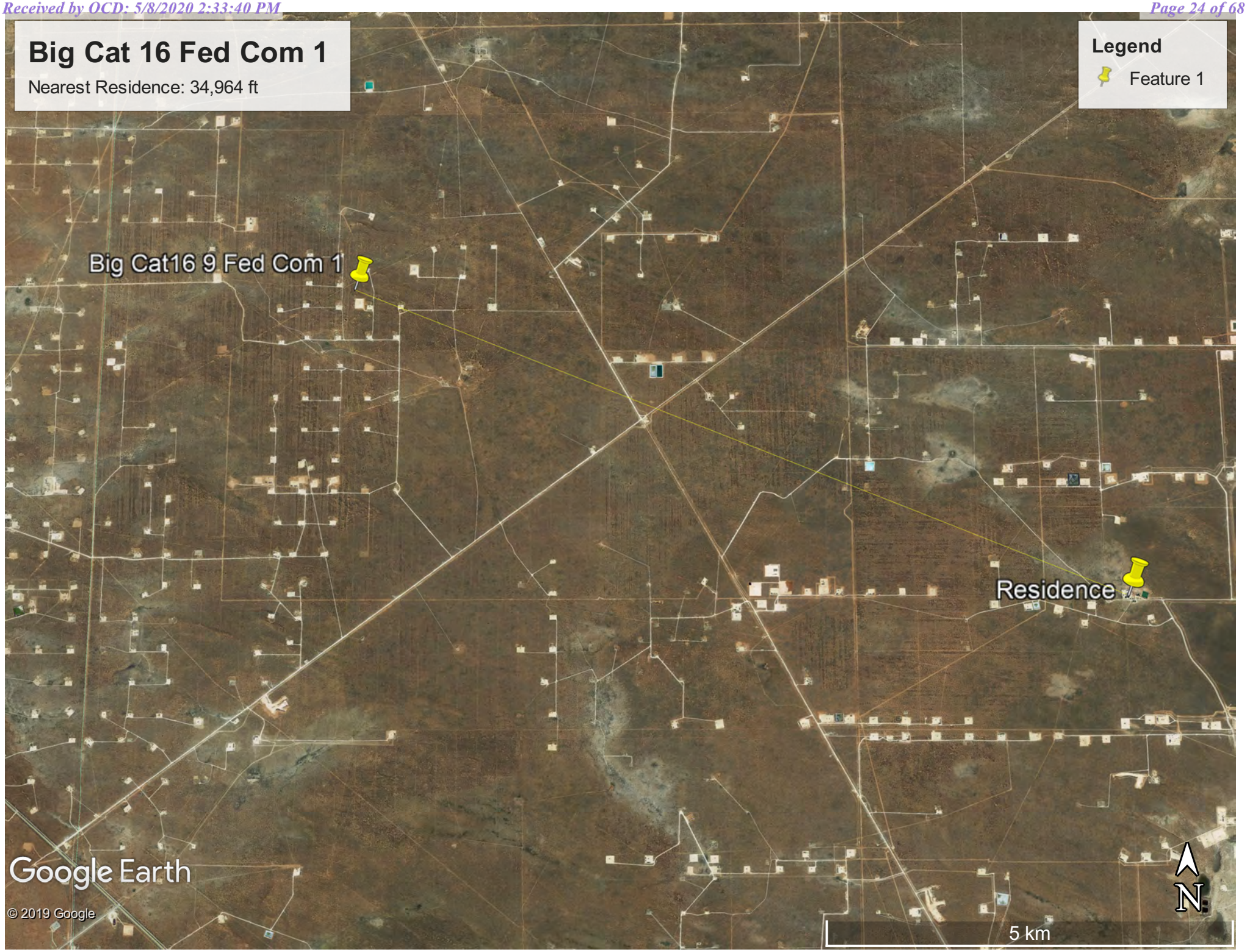
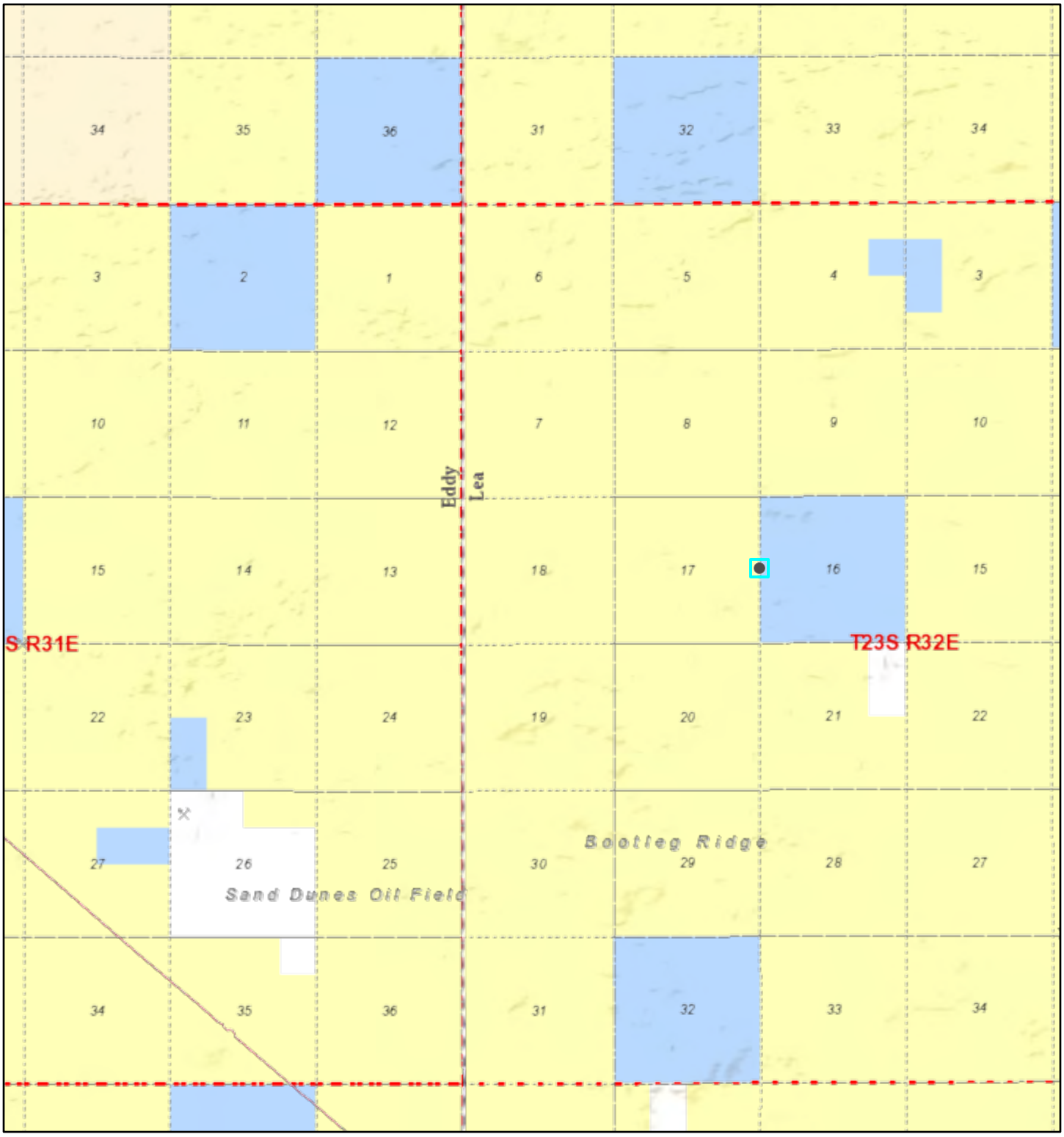
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.


Big Cat 16 Fed Com 1
Nearest Residence: 34,964 ft
Legend
Feature 1
Big Cat16 9 Fed Com 1
Residence
Google Earth
© 2019 Google
N
5 km

Active Mines near Big Cat 16 9 Fed Com 1



2/9/2020, 3:14:33 PM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Registered Mines

- Aggregate, Stone etc.
- Aggregate, Stone etc.

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

National Flood Hazard Layer FIRMette

FEMA

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 2/9/2020 at 5:01:23 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Soil Map—Lea County, New Mexico
(Big Cat Soil Map)

Soil Map—Lea County, New Mexico
(Big Cat Soil Map)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MF	Maljamar and palomas fine sands, 0 to 3 percent slopes	1.8	100.0%
Totals for Area of Interest		**1.8**	**100.0%**

Lea County, New Mexico

MF—Maljamar and palomas fine sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: dmqb
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 15 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Palomas and similar soils: 45 percent
Maljamar and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palomas

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone

Typical profile

A - 0 to 16 inches: fine sand
Bt - 16 to 60 inches: sandy clay loam
Bk - 60 to 66 inches: 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: 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: 45 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Moderate (about 7.5 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 Maljamar

Setting

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

Typical profile

A - 0 to 24 inches: fine sand
Bt - 24 to 50 inches: sandy clay loam
Bkm - 50 to 60 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

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

Minor Components

Wink

Percent of map unit: 5 percent
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Kermit

Percent of map unit: 5 percent
Ecological site: Sandhills (R042XC022NM)

Hydric soil rating: No

Data Source Information

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

ATTACHMENT 4

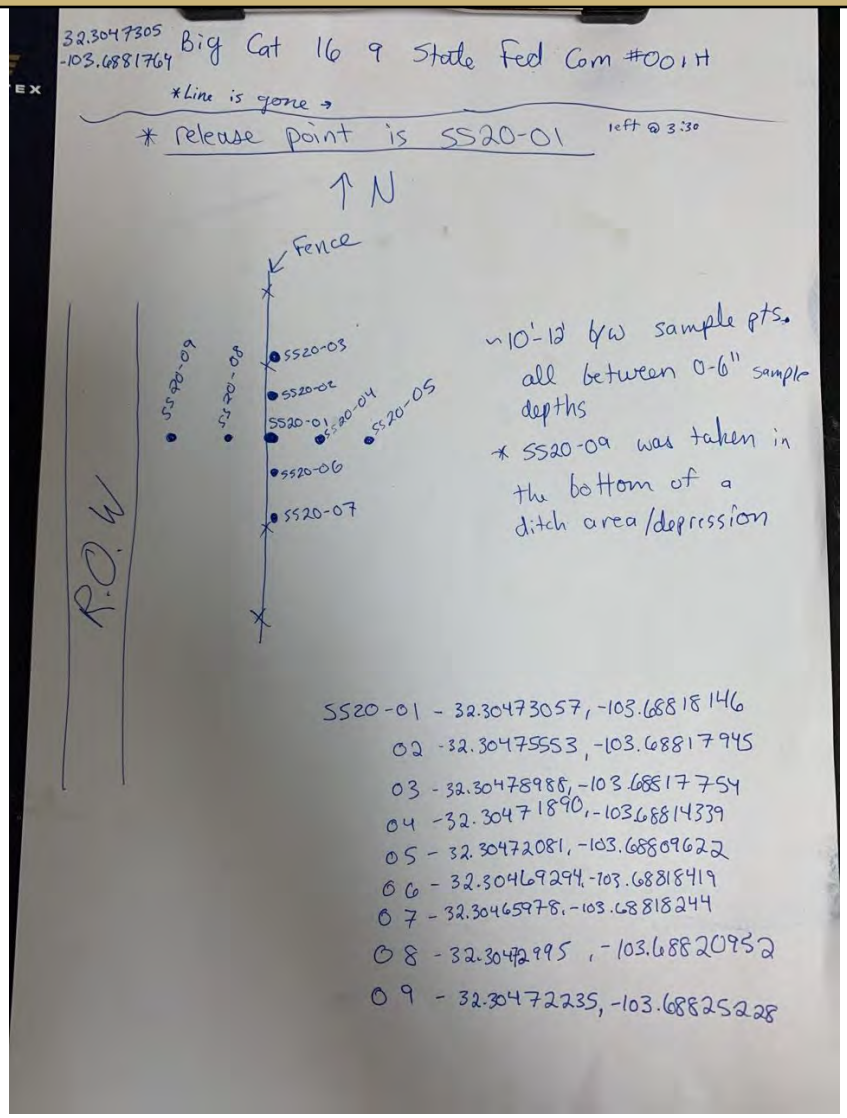
Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	2/18/2020
Site Location Name:	Big Cat 16 9 State Federal Com #001H	Report Run Date:	2/19/2020 12:00 AM
Project Owner:	Amanda Davis	File (Project) #:	20E-00141
Project Manager:	Natalie Gordon	API #:	30-025-43196
Client Contact Name:	Amanda Davis	Reference	05/15/2019 - 219bbl PW Release
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	2/18/2020 12:00 PM
Arrived at Site	2/18/2020 12:30 PM
Departed Site	2/18/2020 3:30 PM
Returned to Office	2/18/2020 4:45 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

12:58 Site Characterization and sampling

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: North
	
From central GPS point looking West	Central Gps point liking south
Viewing Direction: East	**Viewing Direction**: South
	
Central gps point looking east	From central gps point

Daily Site Visit Report

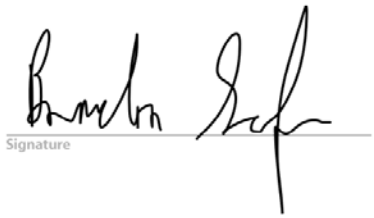
Viewing Direction: East

Field screen results

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Brandon Schafer

Signature: 

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	2/22/2020
Site Location Name:	Big Cat 16 9 State Federal Com #001H	Report Run Date:	2/22/2020 7:04 PM
Project Owner:	Amanda Davis	File (Project) #:	20E-00141
Project Manager:	Natalie Gordon	API #:	30-025-43196
Client Contact Name:	Amanda Davis	Reference	05/15/2019 - 219bbl PW Release
Client Contact Phone #:	(575) 748-0176		

Summary of Times

Left Office	2/22/2020 7:20 AM
Arrived at Site	2/22/2020 8:21 AM
Departed Site	
Returned to Office	

Summary of Daily Operations

8:22 Confirmatory samples

Next Steps & Recommendations

1

Sampling

ES-Base20-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30474250, -103.68818092	Yes

Daily Site Visit Report

ES-Base20-02

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30477036, -103.68817593	Yes

ES-Base20-03

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30472652, -103.68821629	Yes

ES-Base20-04

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30472322, -103.68826402	Yes

ES-Base20-05

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30472127, -103.68815843	Yes

Daily Site Visit Report

ES-Base20-06

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30471273, -103.68810423	Yes

ES-Base20-07

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30469920, -103.68818097	Yes

ES-Base20-08

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30464525, -103.68817894	Yes

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: ES-Base20-01	Sample Point ID: ES-Base20-02
	
Depth: 0 ft.	**Depth:** 0 ft.

Sample Point ID: ES-Base20-03	Sample Point ID: ES-Base20-04
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Sample Point ID: ES-Base20-05	**Sample Point ID**: ES-Base20-06
	
Depth: 0 ft.	**Depth:** 0 ft.

Sample Point ID: ES-Base20-07	**Sample Point ID**: ES-Base20-08
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Brandon Schafer

Signature:

ATTACHMENT 5

Natalie Gordon

From: Natalie Gordon
Sent: Tuesday, February 18, 2020 4:09 PM
To: emnrd-ocd-district1spills@state.nm.us; Mike Bratcher (mike.bratcher@state.nm.us); ramona.marcus@state.nm.us; Mann, Ryan
Cc: Bynum, Tom (Contract); Wesley. Mathews@dvn. com (Wesley.Mathews@dvn.com); Dennis Williams (DWilliams@vertex.ca); Dhugal Hanton (DHanton@vertex.ca)
Subject: NDHR1917147896: Big Cat 16 9 State Federal Com #001H 48-hr Notification of Confirmatory Sampling

All:

Please accept this email as 48-hour notification that Vertex Resource Services has scheduled final confirmatory sampling to be conducted at Big Cat 16 9 State Federal Com #001H (Devon Energy) for the release that occurred on May 15, 2019. Incident #: NDHR1917147896.

On Saturday, February 22, 2020 at approximately 10:00 a.m., Brandon Schafer of Vertex will be onsite to perform confirmation sampling. He can be reached at (701) 301-1564 . If you need directions to the site, please do not hesitate to contact him.

If you have any questions or concerns regarding this notification, please give me a call at (505) 506-0040.

Thank you,
Natalie

ATTACHMENT 6

Client Name: Devon Energy Production Company
Site Name: Big Cat 16 9 State Federal Com #001H
Tracking Number: NDHR1917147896
Project #: 20E-00141-023
Lab Report: 2002A50

Table 2. Confirmatory Sample Laboratory Results - Depth to Groundwater >100 feet

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	0	February 22, 2020	<0.025	<0.221	<4.9	<9.2	<46	<14.1	<60.1	<60
BS20-02	0	February 22, 2020	<0.024	<0.220	<4.9	<8.1	<41	<13.0	<54.0	<60
BS20-03	0	February 22, 2020	<0.023	<0.207	<4.6	<9.8	<49	<14.4	<63.4	<60
BS20-04	0	February 22, 2020	<0.023	<0.207	<4.6	<8.8	<44	<13.4	<57.4	<60
BS20-05	0	February 22, 2020	<0.024	<0.213	<4.7	<8.9	<44	<13.6	<57.6	<60
BS20-06	0	February 22, 2020	<0.024	<0.220	<4.9	<9.2	<46	<14.1	<60.1	<60
BS20-07	0	February 22, 2020	<0.024	<0.213	<4.7	<9.7	<49	<14.4	<63.4	<60
BS20-08	0	February 22, 2020	<0.025	<0.221	<4.9	<9.8	<49	<14.7	<63.7	<60

"-" - Not applicable/assessed

Bold and shaded indicates exceedance outside of applied action level

VERTEX

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

March 02, 2020

Natalie Gordon

Devon Energy
6488 Seven Rivers Highway
Artesia, NM 88210
TEL: (575) 748-0176
FAX:

RE: Big Cat 16-9 State Federal Com 1 OrderNo.: 2002A50

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 8 sample(s) on 2/25/2020 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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Big Cat 16-9 State Federal Com 1
Lab ID: 2002A50-001 **Matrix:** SOIL

Client Sample ID: BS20-01
Collection Date: 2/22/2020 8:50:00 AM
Received Date: 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 6:48:17 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	2/27/2020 5:43:38 PM	50683
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	2/27/2020 5:43:38 PM	50683
Surr: DNOP	116	55.1-146		%Rec	1	2/27/2020 5:43:38 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/27/2020 2:04:40 PM	50657
Surr: BFB	80.5	66.6-105		%Rec	1	2/27/2020 2:04:40 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	2/27/2020 2:04:40 PM	50657
Toluene	ND	0.049		mg/Kg	1	2/27/2020 2:04:40 PM	50657
Ethylbenzene	ND	0.049		mg/Kg	1	2/27/2020 2:04:40 PM	50657
Xylenes, Total	ND	0.098		mg/Kg	1	2/27/2020 2:04:40 PM	50657
Surr: 4-Bromofluorobenzene	89.5	80-120		%Rec	1	2/27/2020 2:04:40 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Client Sample ID: BS20-02
Project: Big Cat 16-9 State Federal Com 1
Collection Date: 2/22/2020 8:55:00 AM
Lab ID: 2002A50-002 **Matrix:** SOIL **Received Date:** 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 7:25:20 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.1		mg/Kg	1	2/27/2020 6:07:26 PM	50683
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	2/27/2020 6:07:26 PM	50683
Surr: DNOP	96.5	55.1-146		%Rec	1	2/27/2020 6:07:26 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/27/2020 2:28:09 PM	50657
Surr: BFB	80.9	66.6-105		%Rec	1	2/27/2020 2:28:09 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	2/27/2020 2:28:09 PM	50657
Toluene	ND	0.049		mg/Kg	1	2/27/2020 2:28:09 PM	50657
Ethylbenzene	ND	0.049		mg/Kg	1	2/27/2020 2:28:09 PM	50657
Xylenes, Total	ND	0.098		mg/Kg	1	2/27/2020 2:28:09 PM	50657
Surr: 4-Bromofluorobenzene	90.7	80-120		%Rec	1	2/27/2020 2:28:09 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Big Cat 16-9 State Federal Com 1
Lab ID: 2002A50-003 **Matrix:** SOIL

Client Sample ID: BS20-03
Collection Date: 2/22/2020 9:00:00 AM
Received Date: 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 7:37:41 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	2/27/2020 6:31:12 PM	50683
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/27/2020 6:31:12 PM	50683
Surr: DNOP	104	55.1-146		%Rec	1	2/27/2020 6:31:12 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	2/27/2020 2:51:35 PM	50657
Surr: BFB	85.6	66.6-105		%Rec	1	2/27/2020 2:51:35 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	2/27/2020 2:51:35 PM	50657
Toluene	ND	0.046		mg/Kg	1	2/27/2020 2:51:35 PM	50657
Ethylbenzene	ND	0.046		mg/Kg	1	2/27/2020 2:51:35 PM	50657
Xylenes, Total	ND	0.092		mg/Kg	1	2/27/2020 2:51:35 PM	50657
Surr: 4-Bromofluorobenzene	96.1	80-120		%Rec	1	2/27/2020 2:51:35 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Client Sample ID: BS20-04
Project: Big Cat 16-9 State Federal Com 1
Collection Date: 2/22/2020 9:03:00 AM
Lab ID: 2002A50-004 **Matrix:** SOIL **Received Date:** 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**JMT**
Chloride	ND	60		mg/Kg	20	2/27/2020 7:50:02 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**CLP**
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	2/27/2020 6:54:56 PM	50683
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	2/27/2020 6:54:56 PM	50683
Surr: DNOP	129	55.1-146		%Rec	1	2/27/2020 6:54:56 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	2/27/2020 4:02:16 PM	50657
Surr: BFB	81.4	66.6-105		%Rec	1	2/27/2020 4:02:16 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst:	**NSB**
Benzene	ND	0.023		mg/Kg	1	2/27/2020 4:02:16 PM	50657
Toluene	ND	0.046		mg/Kg	1	2/27/2020 4:02:16 PM	50657
Ethylbenzene	ND	0.046		mg/Kg	1	2/27/2020 4:02:16 PM	50657
Xylenes, Total	ND	0.092		mg/Kg	1	2/27/2020 4:02:16 PM	50657
Surr: 4-Bromofluorobenzene	91.2	80-120		%Rec	1	2/27/2020 4:02:16 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Client Sample ID: BS20-05
Project: Big Cat 16-9 State Federal Com 1
Collection Date: 2/22/2020 9:05:00 AM
Lab ID: 2002A50-005 **Matrix:** SOIL **Received Date:** 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 8:02:25 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	2/27/2020 7:18:33 PM	50683
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	2/27/2020 7:18:33 PM	50683
Surr: DNOP	129	55.1-146		%Rec	1	2/27/2020 7:18:33 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	2/27/2020 4:25:52 PM	50657
Surr: BFB	79.6	66.6-105		%Rec	1	2/27/2020 4:25:52 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	2/27/2020 4:25:52 PM	50657
Toluene	ND	0.047		mg/Kg	1	2/27/2020 4:25:52 PM	50657
Ethylbenzene	ND	0.047		mg/Kg	1	2/27/2020 4:25:52 PM	50657
Xylenes, Total	ND	0.095		mg/Kg	1	2/27/2020 4:25:52 PM	50657
Surr: 4-Bromofluorobenzene	89.1	80-120		%Rec	1	2/27/2020 4:25:52 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Client Sample ID: BS20-06
Project: Big Cat 16-9 State Federal Com 1
Collection Date: 2/22/2020 9:10:00 AM
Lab ID: 2002A50-006 **Matrix:** SOIL **Received Date:** 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 8:14:47 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	2/27/2020 7:42:08 PM	50683
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	2/27/2020 7:42:08 PM	50683
Surr: DNOP	133	55.1-146		%Rec	1	2/27/2020 7:42:08 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/27/2020 4:49:23 PM	50657
Surr: BFB	78.0	66.6-105		%Rec	1	2/27/2020 4:49:23 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	2/27/2020 4:49:23 PM	50657
Toluene	ND	0.049		mg/Kg	1	2/27/2020 4:49:23 PM	50657
Ethylbenzene	ND	0.049		mg/Kg	1	2/27/2020 4:49:23 PM	50657
Xylenes, Total	ND	0.098		mg/Kg	1	2/27/2020 4:49:23 PM	50657
Surr: 4-Bromofluorobenzene	87.1	80-120		%Rec	1	2/27/2020 4:49:23 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Big Cat 16-9 State Federal Com 1
Lab ID: 2002A50-007 **Matrix:** SOIL

Client Sample ID: BS20-07
Collection Date: 2/22/2020 9:13:00 AM
Received Date: 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 8:27:08 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	2/27/2020 8:05:40 PM	50683
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/27/2020 8:05:40 PM	50683
Surr: DNOP	122	55.1-146		%Rec	1	2/27/2020 8:05:40 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	2/27/2020 5:12:54 PM	50657
Surr: BFB	78.0	66.6-105		%Rec	1	2/27/2020 5:12:54 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	2/27/2020 5:12:54 PM	50657
Toluene	ND	0.047		mg/Kg	1	2/27/2020 5:12:54 PM	50657
Ethylbenzene	ND	0.047		mg/Kg	1	2/27/2020 5:12:54 PM	50657
Xylenes, Total	ND	0.095		mg/Kg	1	2/27/2020 5:12:54 PM	50657
Surr: 4-Bromofluorobenzene	87.2	80-120		%Rec	1	2/27/2020 5:12:54 PM	50657

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 **2002A50**
Date Reported: **3/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Client Sample ID: BS20-08
Project: Big Cat 16-9 State Federal Com 1
Collection Date: 2/22/2020 9:17:00 AM
Lab ID: 2002A50-008 **Matrix:** SOIL **Received Date:** 2/25/2020 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	2/27/2020 8:39:29 PM	50732
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	2/27/2020 8:29:09 PM	50683
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/27/2020 8:29:09 PM	50683
Surr: DNOP	118	55.1-146		%Rec	1	2/27/2020 8:29:09 PM	50683
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/27/2020 5:36:26 PM	50657
Surr: BFB	78.7	66.6-105		%Rec	1	2/27/2020 5:36:26 PM	50657
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	2/27/2020 5:36:26 PM	50657
Toluene	ND	0.049		mg/Kg	1	2/27/2020 5:36:26 PM	50657
Ethylbenzene	ND	0.049		mg/Kg	1	2/27/2020 5:36:26 PM	50657
Xylenes, Total	ND	0.098		mg/Kg	1	2/27/2020 5:36:26 PM	50657
Surr: 4-Bromofluorobenzene	87.2	80-120		%Rec	1	2/27/2020 5:36:26 PM	50657

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		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2002A50**
02-Mar-20

Client: Devon Energy
Project: Big Cat 16-9 State Federal Com 1

Sample ID: **MB-50732**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **50732**	RunNo: **66870**							
Prep Date: **2/27/2020**	Analysis Date: **2/27/2020**	SeqNo: **2300819**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-50732**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **50732**	RunNo: **66870**							
Prep Date: **2/27/2020**	Analysis Date: **2/27/2020**	SeqNo: **2300820**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.4	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#: **2002A50**

02-Mar-20

Client: Devon Energy

Project: Big Cat 16-9 State Federal Com 1

Sample ID: **MB-50683**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **50683**	RunNo: **66883**
Prep Date: **2/26/2020**	Analysis Date: **2/27/2020**	SeqNo: **2299949** 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		125	55.1	146			

Sample ID: **LCS-50683**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **50683**	RunNo: **66883**
Prep Date: **2/26/2020**	Analysis Date: **2/27/2020**	SeqNo: **2299951** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.8	70	130			
Surr: DNOP	5.3		5.000		105	55.1	146			

Sample ID: **MB-50766**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **50766**	RunNo: **66883**
Prep Date: **2/28/2020**	Analysis Date: **2/28/2020**	SeqNo: **2302390** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.7		10.00		86.6	55.1	146			

Sample ID: **LCS-50766**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **50766**	RunNo: **66883**
Prep Date: **2/28/2020**	Analysis Date: **2/28/2020**	SeqNo: **2302393** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.2		5.000		85.0	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#: **2002A50**

02-Mar-20

Client: Devon Energy

Project: Big Cat 16-9 State Federal Com 1

Sample ID: **MB-50657**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **50657**	RunNo: **66806**
Prep Date: **2/25/2020**	Analysis Date: **2/26/2020**	SeqNo: **2297867** 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	850		1000		85.2	66.6	105			

Sample ID: **lcs-50657**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **50657**	RunNo: **66806**
Prep Date: **2/25/2020**	Analysis Date: **2/26/2020**	SeqNo: **2297868** 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	88.3	80	120			
Surr: BFB	910		1000		91.2	66.6	105			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical 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#: **2002A50**
02-Mar-20

Client: Devon Energy
Project: Big Cat 16-9 State Federal Com 1

Sample ID: **MB-50657** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **50657** RunNo: **66806**
Prep Date: **2/25/2020** Analysis Date: **2/26/2020** SeqNo: **2297906** 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: 4-Bromofluorobenzene	0.95		1.000		95.2	80	120			

Sample ID: **LCS-50657** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **50657** RunNo: **66806**
Prep Date: **2/25/2020** Analysis Date: **2/26/2020** SeqNo: **2297907** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	103	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.0	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	106	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		116	80	120			

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: **2002A50** RcptNo: **1**

Received By: Juan Rojas **2/25/2020 10:55:00 AM**

Completed By: **Isaiah Ortiz** **2/25/2020 11:18:39 AM** I-OX

Reviewed By: ENM 2/25/20

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: JR 2/25/20

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	4.2	Good	Not Present			

3 day TAT if 2/25/2020 no rush charge

Chain-of-Custody Record

Client: Devon

Amanda Davis ? Wes Mathews

Mailing Address: on file

Phone #: on file

email or Fax#: on file

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5-day

☑ Standard ☐ Rush

Project Name: Big Cat 16-9 State Federal Com 1

Project #: 20E-00141

Project Manager: Natalie Gordon

Sampler: Brandon Schafer

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 4.3-0.1=4.2 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2002450	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)
2/22	8:50	soil	BS20-01	4oz jar	ice	-001	X	X					X			
2/22	8:55		BS20-02			-002										
	9:00		BS20-03			-003										
	9:03		BS20-04			-004										
	9:05		BS20-05			-005										
	9:10		BS20-06			-006										
	9:13		BS20-07			-007										
	9:17		BS20-08			-008										

Date:	Time:	Relinquished by:	Received by:	Via:	Date Time
2/22/20	1300	Brandon Schafer			2/22/20 1300
2/24/20	1900			courier	2/25/20 10:55

Remarks: Bill: Devon Energy
WO#: 2083666608
CC: Natalie Gordon

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

State of New Mexico
Oil Conservation Division

Incident ID	NDHR1917147896
District RP	1RP-5557
Facility ID	
Application ID	pDHR1917147490

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?	400 (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.

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

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- NA 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	NDHR1917147896
District RP	1RP-5557
Facility ID	
Application ID	pDHR1917147490

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: Amanda Davis Title: Environmental Representative

Signature: Amanda Davis Date: _____

email: amanda.davis@dvn.com Telephone: 575-748-0176

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	NDHR1917147896
District RP	1RP-5557
Facility ID	
Application ID	pDHR1917147490

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.***

[X] A scaled site and sampling diagram as described in 19.15.29.11 NMAC

[X] 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)

[X] Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

[X] 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: Amanda Davis Title: Environmental Representive

Signature: Amanda Davis Date: _____

email: amanda.davis@dvn.com Telephone: 575-748-0176

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: _____