September 30, 2022 Vertex Project #: 22E-00716-09

Spill Closure Report: Routh NU #1 Pipeline (Section 14, Township 19 South, Range 24 East)
County: Eddy
Incident Report: nAPP2223138504

Prepared For: EOG Resources, Inc.
104 South 4th Street
Artesia, New Mexico 88210

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

EOG Resources, Inc. retained Vertex Resource Services Inc. (Vertex) to conduct an assessment for a historical release of produced water directly south of Routh NU #001, API 3001523305, Incident nAPP2223138504 (hereafter referred to as "Routh"). This letter provides a description of the Site Assessment and includes a request for Incident Closure.

Background

The site is located at N 32.66528, W -104.55089 approximately 9 miles northwest of Seven Rivers, New Mexico, on private property. The legal location for the site is Section 14, Township 19 South and Range 24 East in Eddy County, New Mexico. An aerial photograph and site schematic are included in Attachment 1. Ecological settings of the area include vegetation of black grama, tobosa, bunch grasses, threeawns, soaptree yucca, ephedra, fourwing saltbush, with other forbs subdominant. An aerial view schematic is included in Figure 1, Attachment 1.

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2014 – 2017) indicates the site's surface geology is comprised primarily of Qp - Piedmont alluvial deposits (Holocene to lower Pleistocene). Predominant soil texture on the site is Loamy.

There is no surface water located at Routh. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is the Pecos River located approximately 13.9 miles southeast of the site. There are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Incident Description

The incident was reported on August 17, 2022, and involved the release of an undetermined amount of produced water into the pipeline right of way and surrounding pasture. Based on the area footprint, the impact was determined to have exceeded the reportable threshold. Field screening and laboratory analysis results are included in Table 2, Attachment 2. The New Mexico Oil Conservation Division (NMOCD) C-141 Report: nAPP2223138504 is included in Attachment 3. The Daily Field Report (DFRs) and site photographs are included in Attachment 4.

Closure Criteria Determination

The depth to groundwater was determined by drilling a borehole permitted by the New Mexico Office of the State Engineer (NMOSE) within a 0.5-mile radius of the site. The borehole was drilled to a depth of 108 feet, was left open as per requirements on the WR-07 Application for Permit to Drill a Well With No Water Right and an interface probe lowered into the bottom of the borehole to investigate if groundwater may have accumulated during the 72 hour waiting period. No water was found present at that time. The borehole was then plugged as per requirements on the WR-08, Well Plugging Plan of Operations. Documentation used in Closure Criteria Determination research is included in Attachment 5.

Closure Criteria Worksheet			
Site Name: Routh NU #1 Pipeline			
Spill Coordinates:		**X: 32.665303**	**Y: -104.550849**
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater	**>108**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	73,347	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	58,227	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	10,970	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**	4,375	feet
	ii) Within 1000 feet of any fresh water well or spring	4,375	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	447	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
10	Within a 100-year Floodplain	No	year
11	Soil Type	Upton-Reagan complex/Pima	
12	Ecological Classification	Shallow	
13	Geology	Qp	
vertex.ca	**NMAC 19.15.29.12 E (Table 1) Closure Criteria**	>100'	<50' 51-100' >100'

The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 1.

Table 1. Closure Criteria for Soils to Remediation & Reclamation Standards

	Constituent	Limit
0-4 feet bgs (19.15.29.13)	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
DTGW > 100 feet (19.15.29.12)	Chloride	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

TPH – total petroleum hydrocarbons, GRO – gas range organics, DRO – diesel range organics, MRO – motor oil range organics, BTEX – benzene, toluene, ethylbenzene and xylenes

Remedial Actions Taken

An initial site inspection was completed on July 3, 2022, which identified the location of the impact specified in the initial C-141 Report, and white lined the area required for the 811 One Call request. The impacted area was determined to be approximately 52 feet long and 43 feet wide; the total affected area was determined to be 1,527 square feet. The DFR associated with the site inspection is included in Attachment 4.

Remediation efforts began on August 25, 2022, and were completed on September 19, 2022. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on a total of 17 sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and Titration (chlorides). Field screening results were used to identify areas requiring further remediation from those areas showing concentrations below determined closure criteria levels. Soils were removed to a depth of 4 feet bgs. Impacted soil was transported by a licensed waste hauler and disposed of at an approved waste management facility. Field screening results are presented Table 3, Attachment 2.

Notification for continuous confirmatory sampling was provided to the NMOCD on August 25, 2022, and September 7, 2022. The correspondences are included in Attachment 6. Confirmatory composite samples were collected from the base and walls of the excavation in 200 square foot increments. A total of seventeen (17) samples were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to Hall Environmental Analysis Laboratory under chain-of-custody protocols and analyzed for BTEX (EPA Method 8021B), Total Petroleum Hydrocarbons (GRO, DRO, MRO – EPA Method 8015D) and Total Chlorides (EPA Method 300.0). Laboratory results are presented in Table 3, Attachment 2 and the laboratory data report can be found in Attachment 7. All confirmatory samples collected and analyzed were below closure criteria for the site.

Closure Request

The impacted area was fully delineated during the remediation phase, and will be backfilled with local soils. Confirmatory samples were analyzed by the laboratory and found to be below allowable concentrations as per the New Mexico Administrative Code (NMAC) Closure Criteria for Soils Impacted by a Release locations "greater than 100 feet to groundwater". Based on these findings, EOG Resources, Inc. requests closure of Incident nAPP2223138504.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at (575) 361-3561 or scarttar@vertex.ca.

Sally Carttar

09/30/2022

Sally Carttar, B.A.
ENVIRONMENTAL FIELD TECHNICIAN, REPORTING

Date

Michael Moffitt

09/30/2022

Michael Moffitt, B.Sc.
PROJECT MANAGER, REPORT REVIEW

Date

Attachments

Attachment 1. Site Schematics
Attachment 2. Tables
Attachment 3. NMOCD C-141 Report
Attachment 4. Daily Field Reports with Pictures
Attachment 5. Closure Criteria Documentation
Attachment 6. Confirmatory Sampling Notifications to the NMOCD
Attachment 7. Laboratory Data Reports and COCs

References

Assessed and Impaired Waters of New Mexico. New Mexico Department of Surface Water Quality Bureau, (2019). Retrieved from https://gis.web.env.nm.gov/oem/?map=swqb

Interactive Geologic Map. New Mexico Bureau of Geology and Mineral Resources, (2022). Retrieved from http://geoinfo.nmt.edu

Measured Distance from the Subject Site to Residence. Google Earth Pro, (2022). Retrieved from https://earth.google.com

Point of Diversion Location Report. New Mexico Water Rights Reporting System, (2022). Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/wellSurfaceDiversion.html

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Well Log/Meter Information Report. NM Office of the State Engineer, New Mexico Water Rights Reporting System. (2019). Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/meterReport.html

Natural Resources and Wildlife Oil and Gas Releases. New Mexico Oil Conservation Division, (2019). Santa Fe, New Mexico.

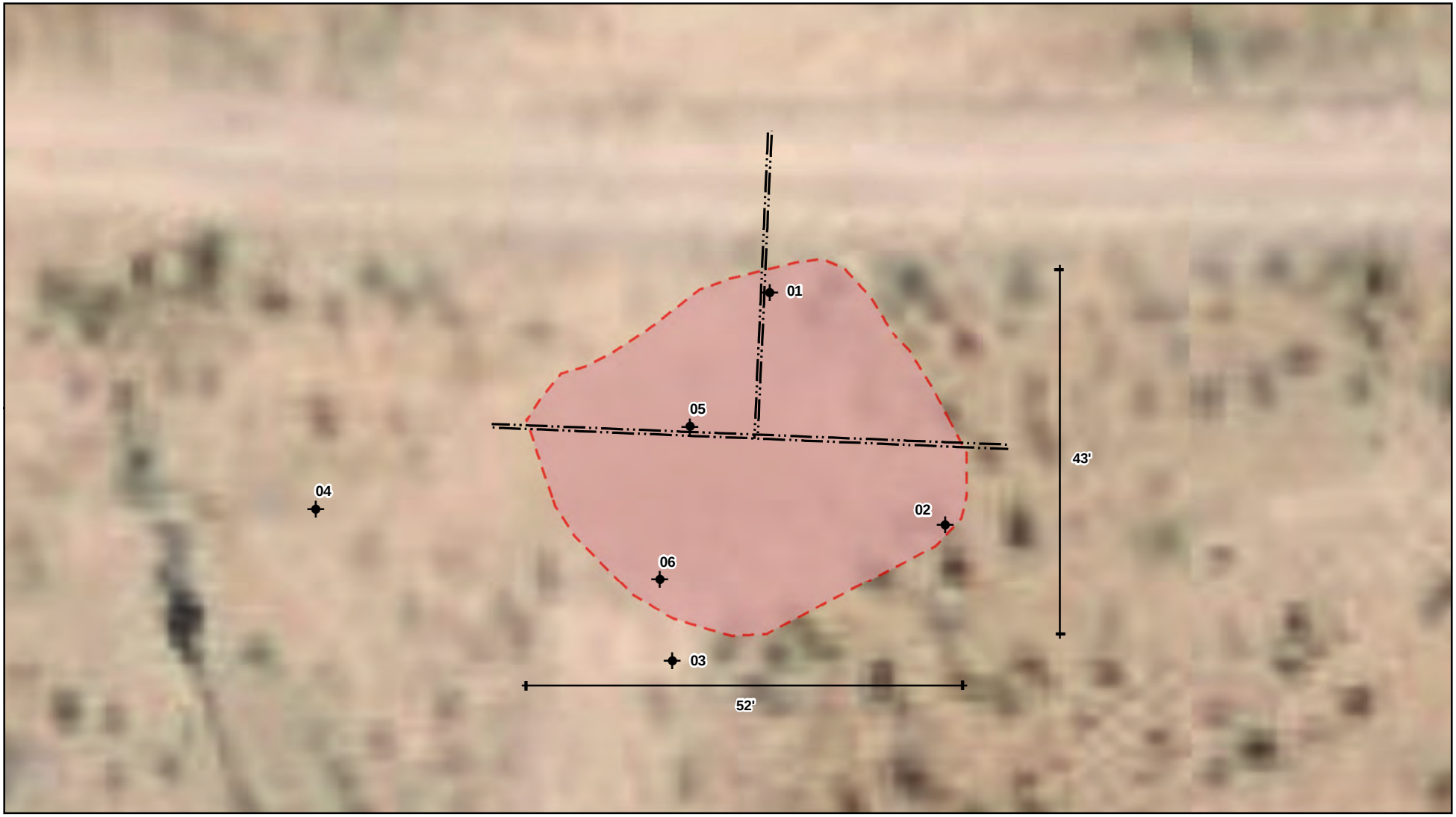
Soil Survey, New Mexico. United States Department of Agriculture, Soil Conservation Service in Cooperation with New Mexico Agricultural Experiment Station. (1971). Retrieved from http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/Chugg%20et%20al%201971%20w-map.pdf

Limitations

This report has been prepared for the sole benefit of EOG Resources, Inc. 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 EOG Resources Inc. 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



Borehole (Prefixed by "BH22-")

Pipeline (Underground)

Approximate Spill Extent (1,527 sq. ft.)

VERTEX

0 2.5 5 10 ft.

Map Center:
Lat/Long: 32.665306, -104.550880

WGS 1984 UTM Zone 13N
Date: Aug 16/22

N

Characterization Schematic
Routh NU #1 Pipeline

FIGURE:
1

eog resources

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: 9.

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Document Path: G:\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716 (Howell Ranch Reclamation Projects)\009 - Routh NU Pipeline\Figure 1 Characterization Schematic (Routh NU Pipeline).mxd

● Base Sample (Prefixed by "BES22-") ▲ Wall Sample (Prefixed by "WES22-") 3" Pipeline 10" Pipeline 4' Excavation Area (~2,353 sq. ft.)

VERTEX

0 5 10 20 ft.

Map Center:
Lat/Long: 32.665266, -104.550853

NAD 1983 UTM Zone 13N
Date: Sep 27/22

N

Confirmation Schematic
Routh NU #1 Pipeline

FIGURE:
2

eog resources

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 imagery from Google Earth, 2016, Features from GPS, Vertex Professional Services Ltd., 2022.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716 (Howell Ranch Reclamation Projects)\009 - Routh NU Pipeline\Figure 2 Confirmation Schematic (Routh NU Pipeline).mxd

ATTACHMENT 2

Client Name: EOG Resources Inc.
Site Name: Routh NU #1 Pipeline
NM OCD Tracking #: nAPP2223138504
Project #: 22E-00716-09
Lab Report: 2208146

Table 2. Initial Characterization Field Screen and Laboratory Results - Depth to Groundwater >100 feet bgs

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Chloride Concentration	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH22-01	0	7-29-22	0	49	ND	ND	ND	ND	ND	ND	ND	ND	**910**
BH22-01	2	7-29-22	0	46	1,873	ND	ND	ND	ND	ND	ND	ND	**4000**
BH22-01	3	7-29-22	0	43	1,526	ND	ND	ND	ND	ND	ND	ND	**4400**
BH22-02	0	7-29-22	0	26	ND	ND	ND	ND	ND	ND	ND	ND	**650**
BH22-02	2	7-29-22	0	28	2,958	ND	ND	ND	ND	ND	ND	ND	**3200**
BH22-02	3	7-29-22	0	27	1,353	ND	ND	ND	ND	ND	ND	ND	**3200**
BH22-03	0	7-29-22	0	32	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH22-03	2	7-29-22	0	32	497	ND	ND	ND	ND	ND	ND	ND	**700**
BH22-03	3	7-29-22	0	46	279	ND	ND	ND	ND	ND	ND	ND	**690**
BH22-04	0	7-29-22	0	19	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH22-04	2	7-29-22	0	24	ND	ND	ND	ND	ND	ND	ND	ND	190
BH22-04	3	7-29-22	0	20	57	ND	ND	ND	ND	ND	ND	ND	280
BH22-05	0	7-29-22	0	43	8,928	ND	ND	ND	ND	ND	ND	ND	**9400**
BH22-05	2	7-29-22	0	29	3,168	ND	ND	ND	ND	ND	ND	ND	**6900**
BS22-05	3	7-29-22	0	58	3,166	ND	ND	ND	ND	ND	ND	ND	ND
BH22-06	0	7-29-22	0	44	2,356	ND	ND	ND	ND	ND	ND	ND	250
BH22-06	2	7-29-22	0	36	1,742	ND	ND	ND	ND	ND	ND	ND	**3800**

"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed
Bold and green shaded indicates exceedance outside of NMOCD Reclamation Criteria

Client Name: EOG Resources, Inc.
Site Name: Routh NU #1 Pipeline
NMOCD Tracking #: nAPP2223138504
Project #: 22E-00716-09
Lab Reports: 2209136, 2209138, 2209622

Table 3. Confirmatory Sample Field Screen and Laboratory Results - Depth to Groundwater >100 feet bgs

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Chloride Concentration	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BES22-01	4'	08/31/22	-	83	3,344	ND	ND	ND	ND	ND	ND	ND	4700
BES22-02	4'	08/31/22	-	747	8,830	ND	ND	ND	470	350	470	820	4400
BES22-03	4'	08/31/22	-	59	6,015	ND	ND	ND	ND	ND	ND	ND	3600
BES22-04	4'	08/31/22	-	79	5,159	ND	ND	ND	ND	ND	ND	ND	4900
BES22-05	4'	08/31/22	-	515	4,713	ND	ND	ND	730	490	730	1220	10000
BES22-06	4'	08/31/22	-	85	3,729	ND	ND	ND	ND	ND	ND	ND	4800
BES22-07	4'	08/31/22	-	25	4,188	ND	ND	ND	ND	ND	ND	ND	3700
BES22-08	4'	09/01/2022	-	31	3,979	ND	ND	ND	ND	ND	ND	ND	2500
BES22-09	4'	09/01/2022	-	39	2,505	ND	ND	ND	ND	ND	ND	ND	1900
BES22-10	4'	09/01/2022	-	39	2,182	ND	ND	ND	ND	ND	ND	ND	2200
BES22-11	4'	09/01/2022	-	56	1,677	ND	ND	ND	ND	ND	ND	ND	2200
BES22-12	4'	09/01/2022	-	39	2,146	ND	ND	ND	ND	ND	ND	ND	2100
BES22-13	4'	09/01/2022	-	60	1,879	ND	ND	ND	ND	ND	ND	ND	2700
~~WES22-01~~	~~0-4~~	~~08/31/2022~~	~~-~~	~~48~~	~~900~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~1100~~
WES22-01	0-4	9/12/2022	-	59	360	ND	ND	ND	ND	ND	ND	ND	360
WES22-02	0-4	09/01/2022	-	36	615	ND	ND	ND	ND	ND	ND	ND	480
WES22-03	0-4	09/01/2022	-	27	718	ND	ND	ND	ND	ND	ND	ND	310
~~WES22-04~~	~~0-4~~	~~09/01/2022~~	~~-~~	~~33~~	~~780~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~680~~
WES22-04	0-4	09/12/2022	-	45	612	ND	ND	ND	ND	ND	ND	ND	290

"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed
Bold and green shaded indicates exceedance outside of NMOCD Reclamation Criteria

ATTACHMENT 3

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	nAPP2223138504
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party EOG Resources, Inc.	OGRID 7377
Contact Name Chase Settle	Contact Telephone 575-748-1471
Contact email Chase_Settle@eogresources.com	Incident # *nAPP2223138504*
Contact mailing address 104 S. 4th Street, Artesia, NM 88210	

Location of Release Source

Latitude 32.66528 Longitude -104.55089
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Routh NU Pipeline	Site Type Pipeline
Date Release Discovered 8/18/2022	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
A	14	19S	24E	Eddy

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☑ Private (*Name:* Howell Ranch)

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) Unknown	Volume Recovered (bbls) 0
	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

The landowner provided notices of suspected historical impacts along the pipeline Right of Way. The environmental consultant retained to investigate the area determined on 8/17/2022, based on the impacted area footprint, that the release more than likely breached the reportable threshold.

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2223138504
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: Chase Settle Title: Rep Safety & Environmental Sr

Signature: Chase Settle Date: 08/19/2022

email: Chase_Settle@eogresources.com Telephone: 575-748-1471

OCD Only

Received by: _____ Date: _____

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 135867
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	8/19/2022

District I
1625 N. French Dr., Hobbs, NM 88240
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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	nAPP2223138504
District RP	
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?	>108 (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
- ☑ Boring or excavation logs
- ☑ Photographs including date and GIS information
- ☑ Topographic/Aerial maps
- ☑ Laboratory data including chain of custody

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2223138504
District RP	
Facility ID	
Application ID	

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.

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: Chase Settle Title: Rep Safety & Environmental Sr

Signature: Chase Settle Date: 09/30/2022

email: Chase_Settle@eogresources.com Telephone: 575-748-1471

OCD Only

Received by: Jocelyn Harimon Date: 09/30/2022

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2223138504
District RP	
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: Chase Settle Title: Rep Safety & Environmental Sr

Signature: Chase Settle Date: 09/30/2022

email: Chase_Settle@eogresources.com Telephone: 575-748-1471

OCD Only

Received by: Jocelyn Harimon Date: 09/30/2022

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: 12/28/2022

Printed Name: Jocelyn Harimon Title: Environmental Specialist

ATTACHMENT 4

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	7/3/2022
Site Location Name:	Routh NU #1 Pipeline	Report Run Date:	7/3/2022 8:36 PM
Client Contact Name:	Chase Settle	API #:	
Client Contact Phone #:	575-703-6537		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	7/3/2022 8:11 AM
Departed Site	7/3/2022 9:15 AM

Field Notes

8:47 Whitelined impacted area

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West

East side of white lined impacted area

Viewing Direction: North

South side of white lined impacted area

Viewing Direction: East

West side of white lined impacted area

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Zachery Englebert

Signature: 

Signature

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	7/29/2022
Site Location Name:	Routh NU #1 Pipeline	Report Run Date:	7/29/2022 11:02 PM
Client Contact Name:	Chase Settle	API #:	
Client Contact Phone #:	575-703-6537		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	7/29/2022 8:55 AM
Departed Site	7/29/2022 3:08 PM

Field Notes

11:51 Arrived on site and field out safety paperwork

11:53 Finished gathering soil samples

Collected BH22 - (1-6) at 0 ft, 2 ft, and 3ft.

11:53 We will begin field screening soil samples

16:39 Field screened samples and put samples into jars.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: South	**Viewing Direction**: South
	
BH22-01	BH22-02
Viewing Direction: South	**Viewing Direction**: South
	
BH22-03	BH22-04

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: South
	
BH22-05	BH22-06

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Jacob Reta

Signature: 
Signature

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	8/29/2022
Site Location Name:	Routh NU #1 Pipeline	Report Run Date:	8/29/2022 10:32 PM
Client Contact Name:	Chase Settle	API #:	
Client Contact Phone #:	575-703-6537		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	8/29/2022 8:45 AM
Departed Site	8/29/2022 2:56 PM

Field Notes

10:32 Arrived on site, held safety meeting

10:32 Performed line locate sweep

Next Steps & Recommendations

1 Waiting on plastic liner to be delivered to job site so there is a place to store the removed soil until it is picked up

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest	**Viewing Direction**: East
	
View of job site	Current excavation
Viewing Direction: South	**Viewing Direction**: East
	
Excavation progress	Excavation progress

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: West
	
View of job	View of job

Viewing Direction: East	**Viewing Direction**: North
	
View of job	View of job

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Zachery Englebert

Signature: 

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	8/31/2022
Site Location Name:	Routh NU #1 Pipeline	Report Run Date:	8/31/2022 10:28 PM
Client Contact Name:	Chase Settle	API #:	
Client Contact Phone #:	575-703-6537		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	8/31/2022 8:30 AM
Departed Site	8/31/2022 3:45 PM

Field Notes

8:43 Completed safety meeting running line locator before starting excavation

8:45 Sent two trucks to landfill

11:35 Stopping work for 30 minutes for lightning

12:59 Ran line locator in excavation area

15:30 Screened new wall samples, WES22-01 low enough to send to lab

Next Steps & Recommendations

1 Continue excavation

Daily Site Visit Report

Site Photos

Viewing Direction: South	**Viewing Direction**: Southeast
	
Excavation this morning	Excavation complete, starting sampling
Viewing Direction: West	**Viewing Direction**: South
	
Excavation after rain	Excavation with puddles

Daily Site Visit Report

Viewing Direction: Southwest	**Viewing Direction**: Southeast
	
Stockpile currently	Planned excavation area

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sally Carttar

Signature: 

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	9/12/2022
Site Location Name:	Routh NU #1 Pipeline	Report Run Date:	9/12/2022 11:26 PM
Client Contact Name:	Chase Settle	API #:	
Client Contact Phone #:	575-703-6537		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	9/12/2022 2:45 PM
Departed Site	9/12/2022 4:15 PM

Field Notes

14:52 Completing safety meeting, then will begin sampling.

16:00 Sampling complete. Both samples will be sent to lab

Next Steps & Recommendations

1 Await lab results

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest	**Viewing Direction**: Southeast
	
Excavation	Excavation
Viewing Direction: East	**Viewing Direction**: North
	
Excavation	Excavation

Daily Site Visit Report

Viewing Direction: Northwest

Excavation

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sally Carttar

Signature: 

ATTACHMENT 5

RANGER ENVIRONMENTAL SERVICES, INC.
Ranger Environmental Services, LLC
P.O. Box 201179,
Austin, Texas 78720
Phone: (512)335-1785
Fax: (512)335-0527

BORING NUMBER SB-1

PAGE 1 OF 1

CLIENT EOG Resources, Inc.
PROJECT NAME Federal CM-1
PROJECT NUMBER 5375
PROJECT LOCATION Eddy County, New Mexico
DATE STARTED 9/26/22 **COMPLETED** 9/26/22
GROUND WATER LEVELS:
DRILLING CONTRACTOR HCI
AT TIME OF DRILLING --- Dry
DRILLING METHOD Air Rotary
AFTER DRILLING --- Dry
LOGGED BY William Kennedy **CHECKED BY** P. Finn
BTOC = Below Top Of Casing
GB = Grab Sample
GEO = Geotech Sample
GPS COORDINATES 32.66546743°, -104.55115675°

DEPTH (ft)	SOIL SAMPLE ANALYSIS	GROUNDWATER LEVELS (BTOC)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0					Casing Type: 2" Diameter Temp. Well
4.0				(GM) Silty Gravel, brown to tan, firm to stiff	
				(ML) Clayey Silt, white to tan, stiff to very stiff	
25.0				(ML) Clayey Sandy Silt, reddish-brown to maroon, very soft to firm	Riser
60.0					
65.0				(ML) Clayey Sandy Silt, tan to pink, soft to very soft	
				(ML) Clayey Sandy Silt, dark red, soft to very soft	
80.0					
85.0				(ML) Clayey Sandy Silt, reddish-brown, soft to very soft to firm	
				(ML) Clayey Sandy Silt, dark red, very soft to firm/some stiff	
105.0					Temporary Well Screen
108.0				(ML) Clayey Sandy Silt, light brown to light red, very soft to firm	

Bottom of borehole at 108.0 feet- Dry upon completion.

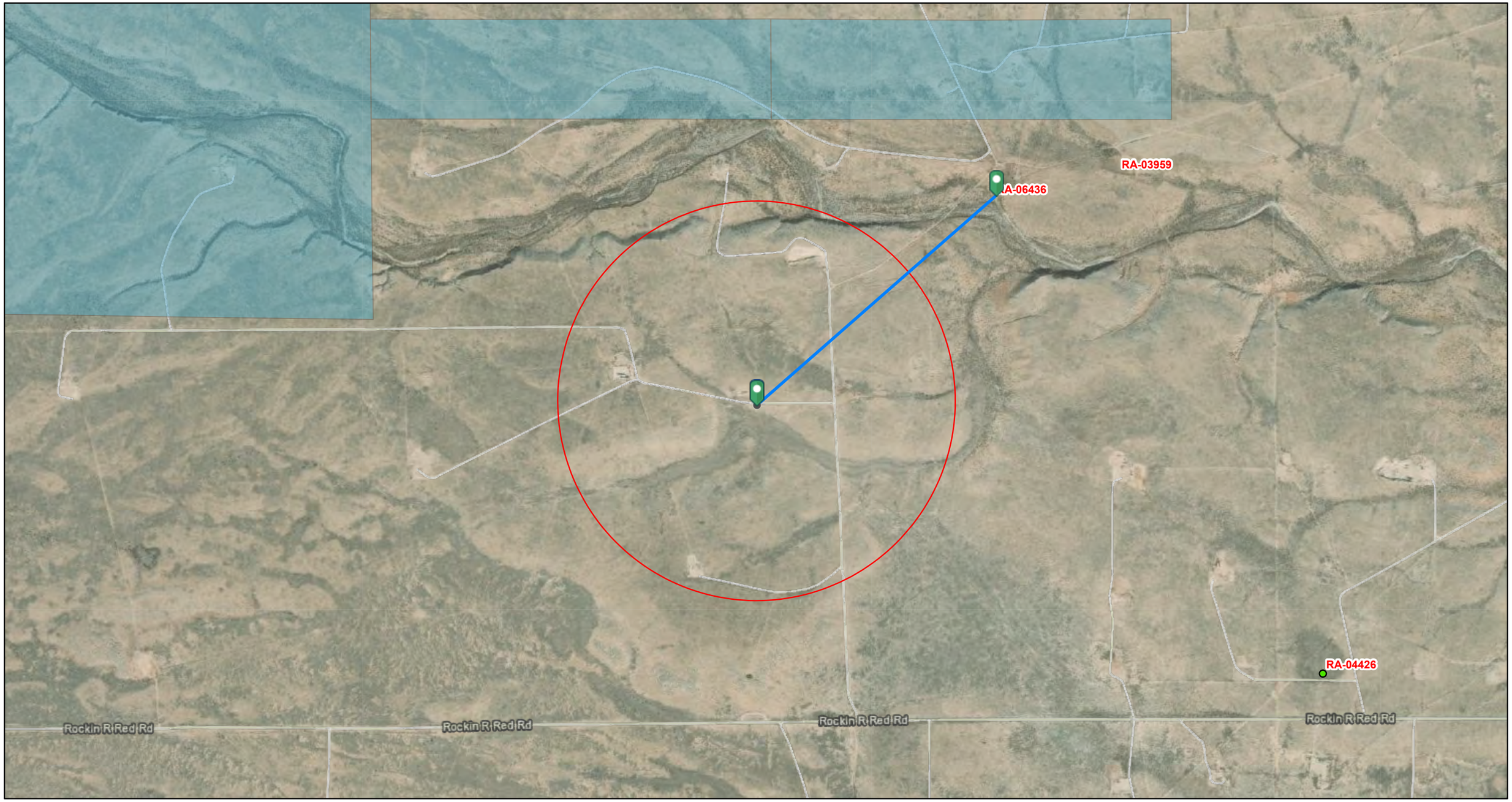
NOTE: 72 hours after completion Ranger personnel evaluated the temporary well for the presence of water utilizing a Heron Instruments electronic water meter. No water was detected in the temporary well. Following completion of the investigation, the temporary well/soil boring was plugged and abandoned.

ENVIRONMENTAL BH - GINT STD US.GDT - 9/29/22 08:47 - R:\DRAFTING FILES\GINT LOGS\5375 - FEDERAL CM-1 - BORING LOGS.GPJ

Federal CM-1 DTGW Borehole

Routh NU Pipeline is located within a 0.50 mile radius (80 ft.)
DTGW > 100 feet (19.15.29.12)

OSE POD Locations Map



6/27/2022, 3:03:12 PM

GIS WATERS PODs
- Pending
- OSE District Boundary

Water Right Regulations
- Closure Area

New Mexico State Trust Lands
- Both Estates
- SiteBoundaries

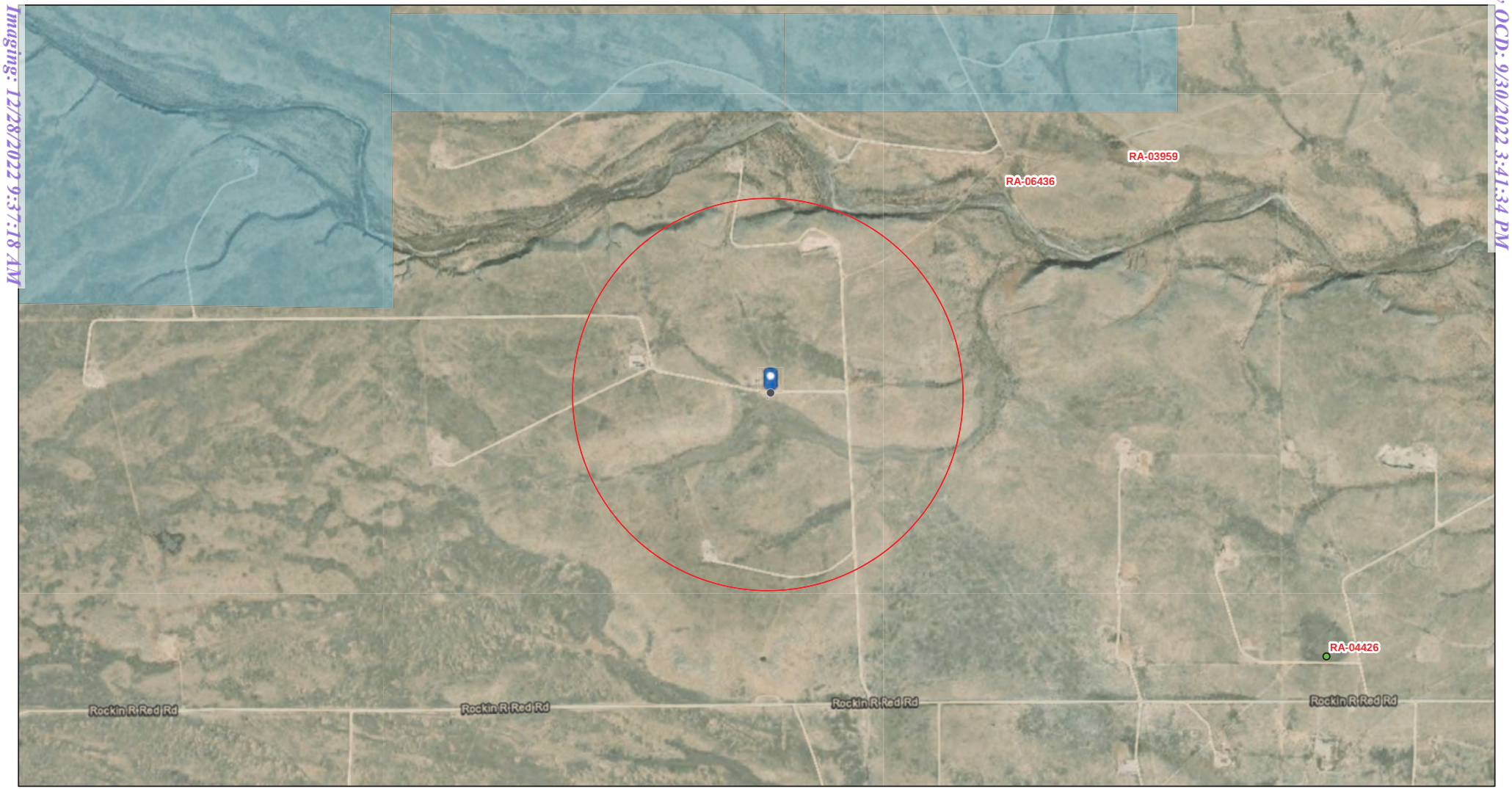
1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

Esri, HERE, GeoTechnologies, Inc., Esri, HERE, Garmin, GeoTechnologies, Inc., U.S. Department of Energy Office of Legacy Management, Maxar

OSE POD Locations Map



6/27/2022, 2:43:46 PM

GIS WATERS PODs
- Pending
- OSE District Boundary

Water Right Regulations
- Closure Area

New Mexico State Trust Lands
- Both Estates
- SiteBoundaries

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

Esri, HERE, GeoTechnologies, Inc., Esri, HERE, Garmin, GeoTechnologies, Inc., U.S. Department of Energy Office of Legacy Management, Maxar

Unofficial Online Map
These maps are distributed "as is" without warranty of any kind.

New Mexico Office of the State Engineer
Point of Diversion Summary

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

Well Tag	POD Number	Q64	Q16	Q4	Sec	Twn	Rng	X	Y
	RA 06436	3	1	4	12	19S	24E	543083	3615122*

Driller License: 406 **Driller Company:** TIDWELL, CLYDE J.

Driller Name:

Drill Start Date: 01/30/1979 **Drill Finish Date:** 02/04/1979 **Plug Date:**

Log File Date: 02/04/1979 **PCW Rcv Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:**

Casing Size: **Depth Well:** **Depth Water:** 300 feet

Meter Number: 4261 **Meter Make:** MCCROMETER

Meter Serial Number: 14-01823 **Meter Multiplier:** 100.0000

Number of Dials: 6 **Meter Type:** Diversion

Unit of Measure: Gallons **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Quarterly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
01/11/2000	2000	0	A	RPT		0	
07/11/2000	2000	0	A	RPT		0	
10/11/2000	2000	0	A	RPT		0	
01/03/2001	2000	0	A	RPT		0	
04/09/2001	2001	0	A	RPT		0	
07/09/2001	2001	0	A	RPT	not water used this quater	0	
01/23/2002	2001	16020	A	RPT		0	
04/04/2002	2002	16020	A	RPT		0	
07/06/2002	2002	23670	A	RPT		0.023	
10/09/2002	2002	26528	A	RPT		0.009	
01/14/2003	2002	32468	A	RPT		0.018	
04/16/2003	2003	35292	A	RPT		0.009	
08/18/2003	2003	53990	A	tw		0.057	
10/28/2003	2003	57574	A	tw		0.011	
01/08/2004	2004	57574	A	tw		0	
04/15/2004	2004	61694	A	sj		0.013	
07/06/2004	2004	61694	A	sj		0	
10/02/2004	2004	92200	A	sj		0.094	
01/10/2005	2004	108867	A	sj		0.051	
04/11/2005	2005	109923	A	RPT		0.003	
07/09/2005	2005	112043	A	RPT		0.007	
10/04/2005	2005	116328	A	RPT		0.013	
12/31/2005	2005	129760	A	ch		0.041	
02/27/2006	2006	140575	A	ch		0.033	
03/01/2006	2006	0	A	RPT	Initial reading	0	

07/07/2006	2006	29996	A	RPT	9.205	
10/02/2006	2006	44829	A	RPT	4.552	
04/10/2007	2007	52670	A	RPT	2.406	
07/09/2007	2007	55001	A	RPT	0.715	
10/10/2007	2007	55501	A	RPT	0.153	
01/08/2008	2007	57425	A	RPT	0.590	
04/08/2008	2008	58751	A	RPT	0.407	
07/08/2008	2008	61160	A	RPT	0.739	
10/09/2008	2008	61589	A	RPT	0.132	
01/08/2009	2008	62400	A	RPT	0.249	
01/01/2010	2009	65837	A	RPT	1.055	
10/05/2011	2011	20693	A	RPT	Final reading/Temp Meter	6.350
10/05/2011	2011	0	A	RPT	Initial reading/Temp meter	0
10/05/2011	2011	70831	A	RPT	1.533	
07/09/2012	2012	6707	A	RPT	Temp Meter/Final Reading	1.329
07/09/2012	2012	2376	A	RPT	Temp Meter/Initial Reading	0
05/08/2013	2013	84373	A	RPT	4.156	
05/08/2013	2013	70831	A	RPT	Old Meter Reinstalled/New read	0
07/10/2013	2013	84727	A	RPT	0.109	
10/01/2013	2013	85221	A	RPT	0.152	
01/01/2014	2013	243320	R	RPT	Corrected reading	48.519
04/01/2014	2014	244217	A	RPT	Corrected reading	0.275
07/01/2014	2014	271687	A	RPT	8.430	
10/01/2014	2014	304194	A	RPT	9.976	
07/01/2015	2015	344217	A	RPT	12.283	
10/08/2015	2015	344217	A	RPT	0	
01/01/2016	2016	344217	A	ap	0	
04/01/2016	2016	344217	A	ap	0	
07/01/2016	2016	344217	A	ap	0	
10/01/2016	2016	344217	A	ap	0	
01/01/2017	2017	344217	A	ap	0	
04/04/2017	2017	181180	A	ap	newmeterstartedw/181180	0
07/06/2017	2017	236029	A	ap	16.833	
10/06/2017	2017	257069	A	ap	6.457	
01/03/2018	2018	289625	A	ap	9.991	
04/01/2018	2018	289625	A	ap	0	
07/01/2018	2018	289625	A	ap	0	
10/01/2018	2018	289625	A	RPT	0	
01/01/2019	2019	289625	A	RPT	0	
04/01/2019	2019	289625	A	RPT	0	
07/01/2019	2019	289625	A	RPT	0	
10/01/2019	2019	289734	A	RPT	0.033	
01/01/2020	2020	289734	A	RPT	0	
10/01/2020	2020	323186	A	RPT	10.266	
01/01/2021	2020	323186	A	RPT	0	
07/01/2021	2021	337019	A	WEB	4.245	X
09/01/2021	2021	337019	A	WEB	0	X
01/01/2022	2022	341063	A	WEB	1.241	X
01/22/2022	2022	27158	A	RPT	First Reading Replaced Meter	0

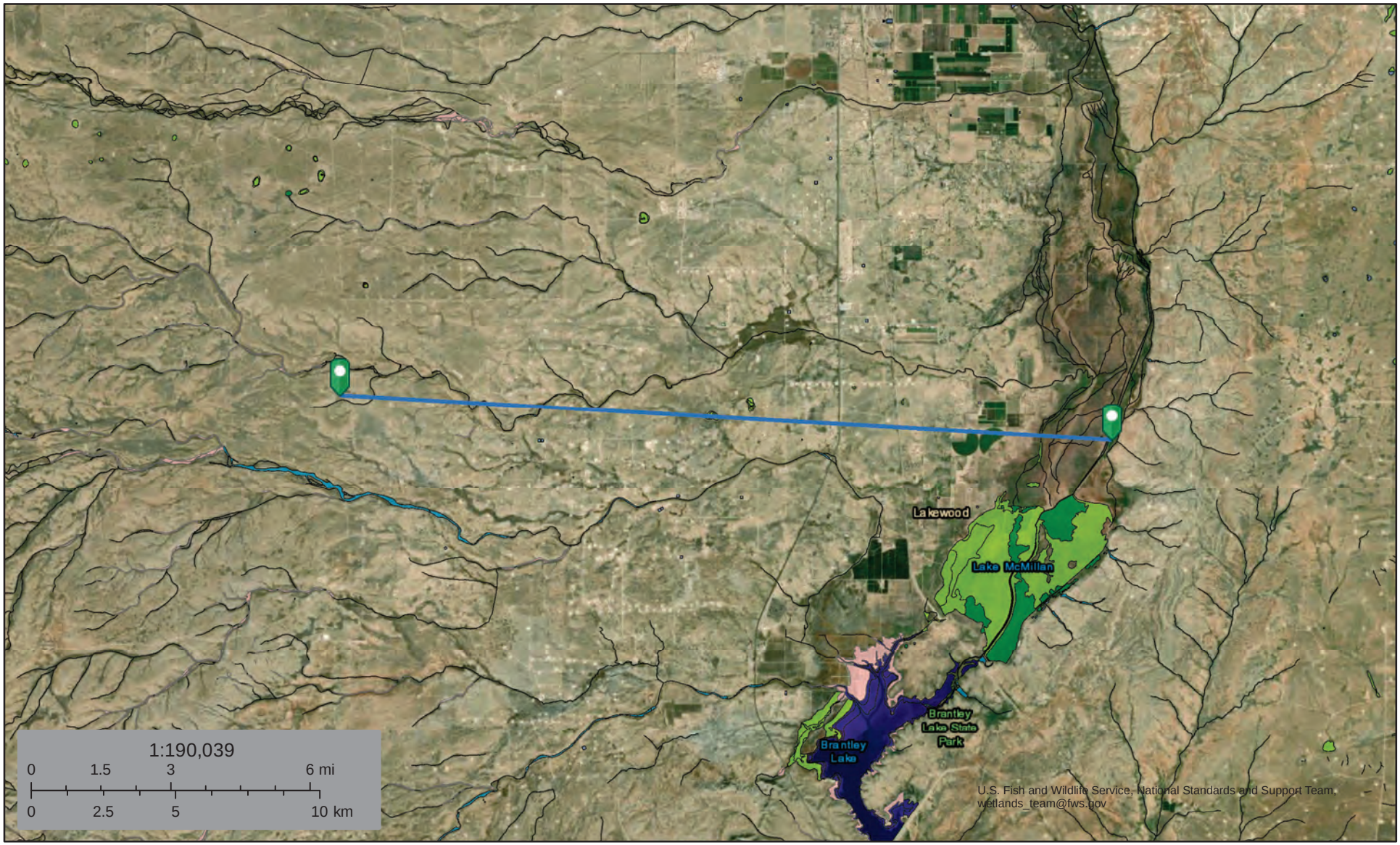
01/22/2022	2022	341077	A	RPT	Last reading for meter	0.004
04/01/2022	2022	30695	A	RPT		1.085

**YTD Meter Amounts:	Year	Amount
	2000	0
	2001	0
	2002	0.050
	2003	0.077
	2004	0.158
	2005	0.064
	2006	13.790
	2007	3.864
	2008	1.527
	2009	1.055
	2010	0
	2011	7.883
	2012	1.329
	2013	52.936
	2014	18.681
	2015	12.283
	2016	0
	2017	23.290
	2018	9.991
	2019	0.033
	2020	10.266
	2021	4.245
	2022	2.330

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Routh NU #1 Pipeline



June 28, 2022

Wetlands

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

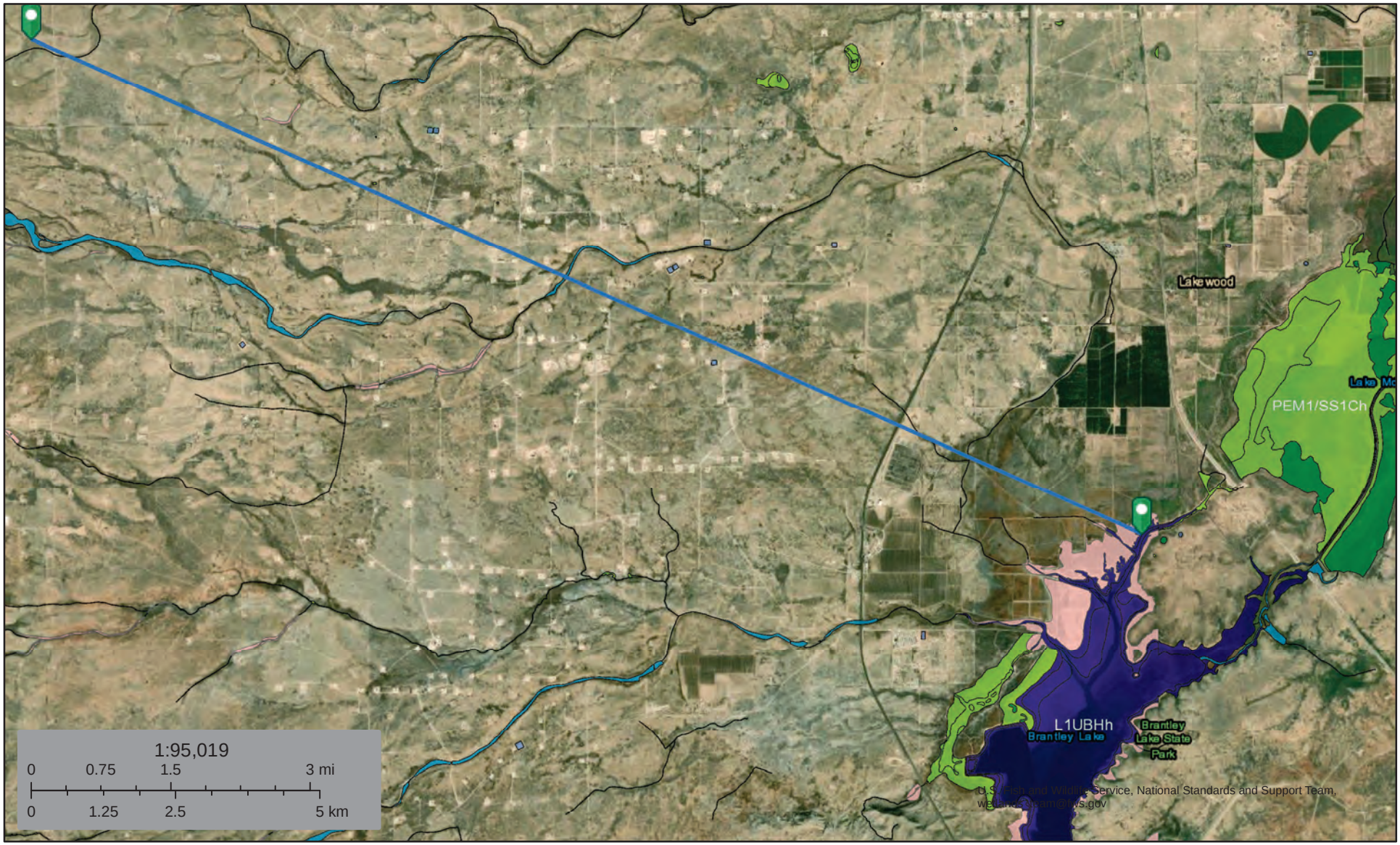
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

U.S. Fish and Wildlife Service

National Wetlands Inventory

Routh NU #1 pipeline



June 28, 2022

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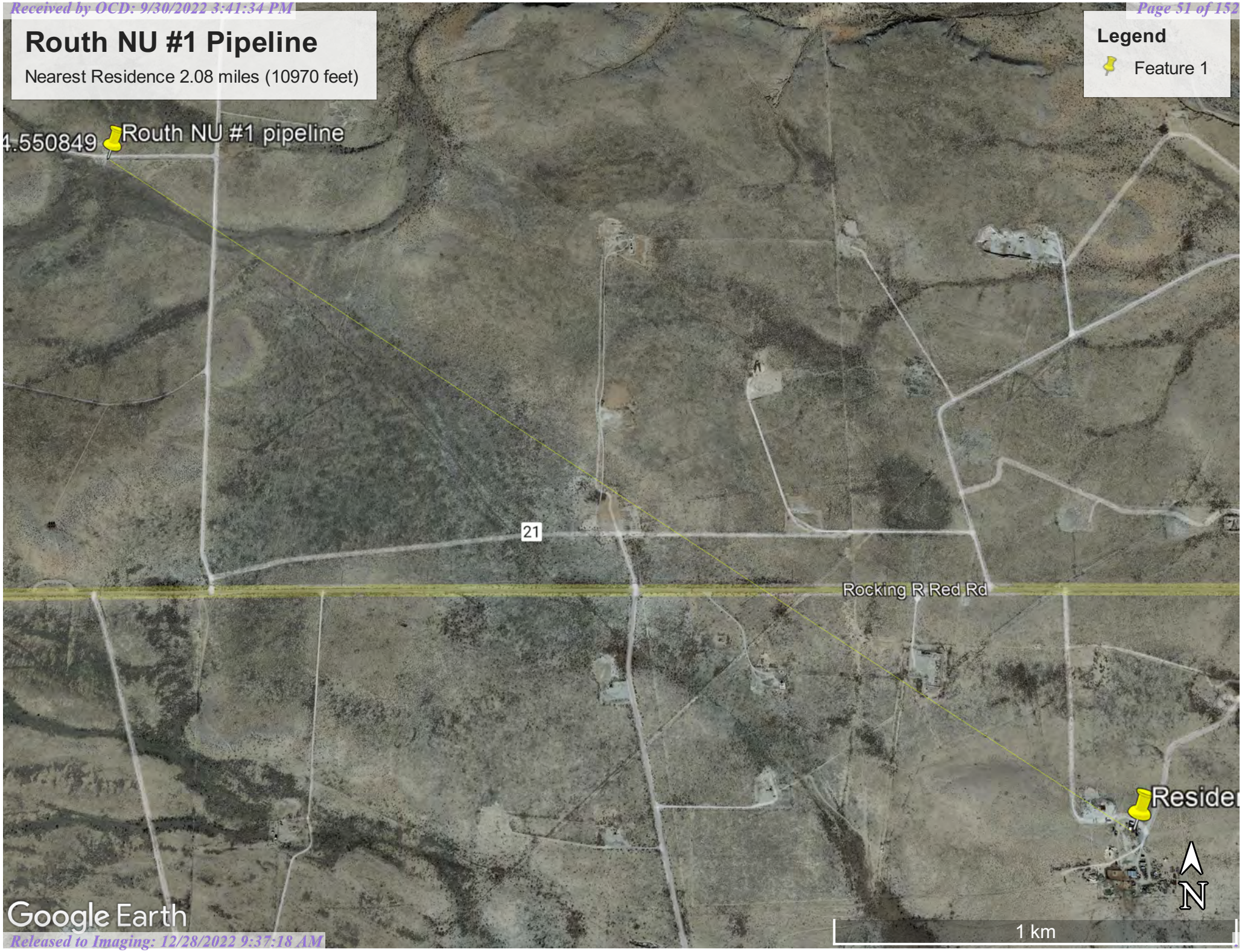
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Routh NU #1 Pipeline

Nearest Residence 2.08 miles (10970 feet)



New Mexico Office of the State Engineer
Water Right Summary

get image list

WR File Number: RA 06436 **Subbasin:** RA **Cross Reference:** -

Primary Purpose: STK 72-12-1 LIVESTOCK WATERING

Primary Status: DCL DECLARATION

Total Acres: 0 **Subfile:** - **Header:** -

Total Diversion: 43.5 **Cause/Case:** -

Owner: JAMES H & BETTY R HOWELL REVOCABLE TRUST

Contact: ALAN HOWELL

Documents on File

	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
get images	534919	COWNF	2013-09-30	CHG	PRC	RA 06436	T		0	
	207182	COWNF	2001-02-28	CHG	PRC	RA 06436	T		3	
	247678	DCL	1995-09-19	DCL	PRC	RA 06436	T	0	40.5	
	252693	72121	1995-05-03	PMT	MTR	RA 06436	T		3	
get images	207180	72121	1979-01-25	PMT	APR	RA 06436	T		3	

Current Points of Diversion

(NAD83 UTM in meters)

POD Number	Well Tag	Source	Q 64	Q16	Q4	Sec	Tws	Rng	X	Y	Other Location Desc
RA 06436		Shallow	3	1	4	12	19S	24E	543083	3615122*	

***An (*) after northing value indicates UTM location was derived from PLSS - see Help**

Priority Summary

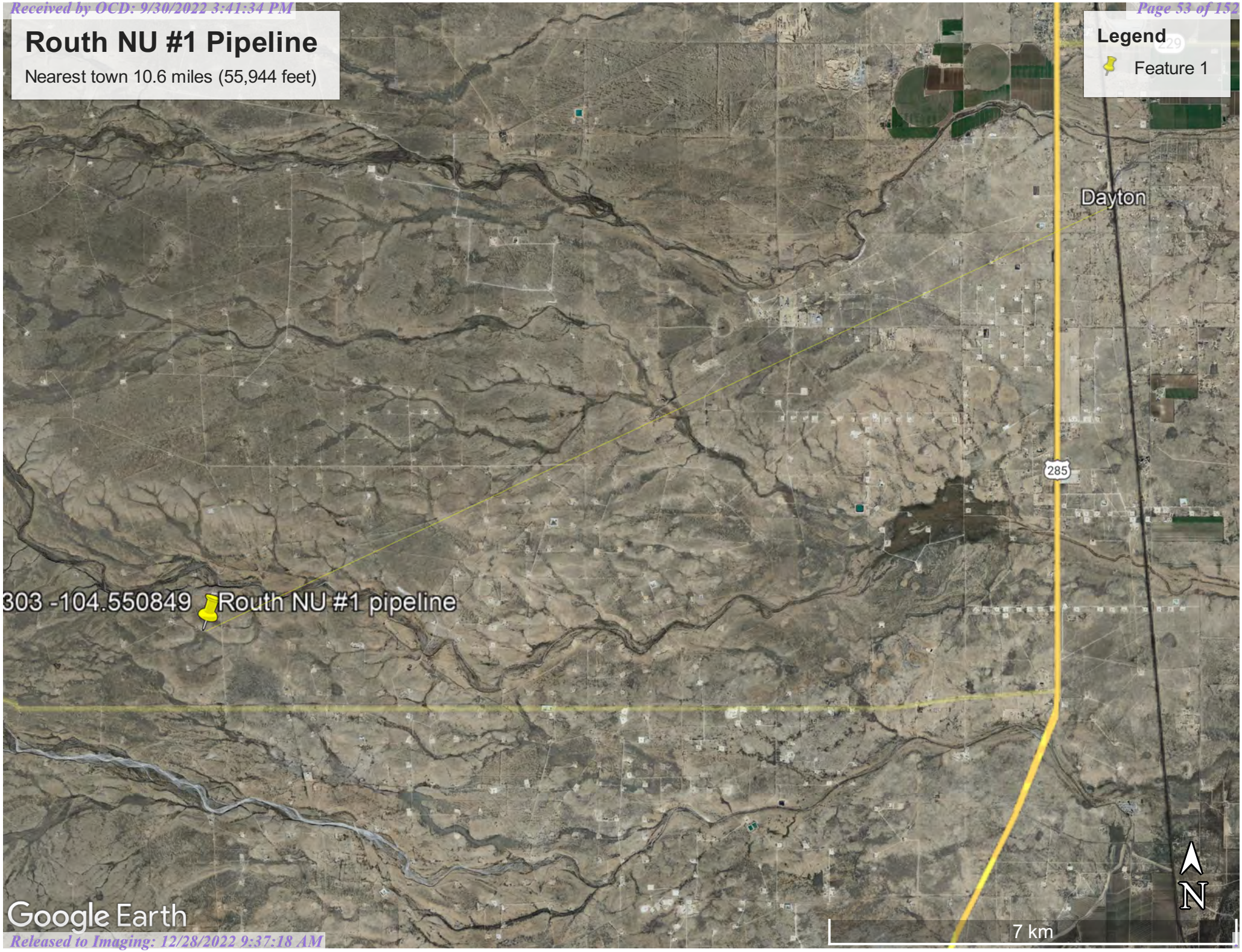
Priority	Status	Acres	Diversion	Pod Number	
12/31/1929	DCL	0	43.5	RA 06436	Shallow

Place of Use

Q 256	Q 64	Q16	Q4	Sec	Tws	Rng	Acres	Diversion	CU	Use	Priority	Status	Other Location Desc
										STK		DCL	NO PLACE OF USE GIVEN

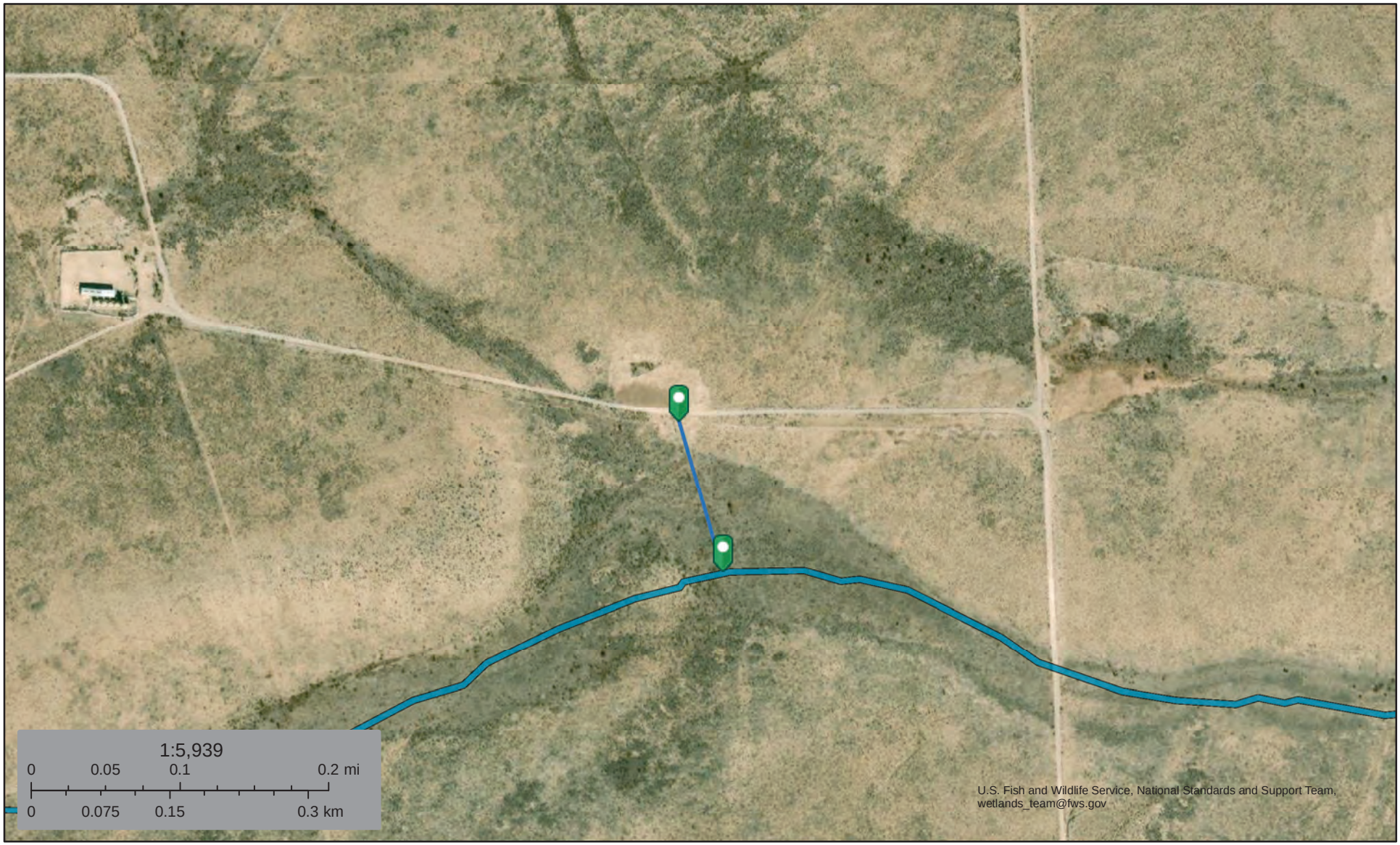
Source

Acres	Diversion	CU	Use	Priority	Source	Description
0	40.5		STK	12/31/1929	GW	SHALLOW


Routh NU #1 Pipeline
Nearest town 10.6 miles (55,944 feet)
Legend
Feature 1
Dayton
285
303 -104.550849 Routh NU #1 pipeline
Google Earth
7 km
N

U.S. Fish and Wildlife Service
National Wetlands Inventory

Routh NU #1 Pipeline



June 28, 2022

Wetlands

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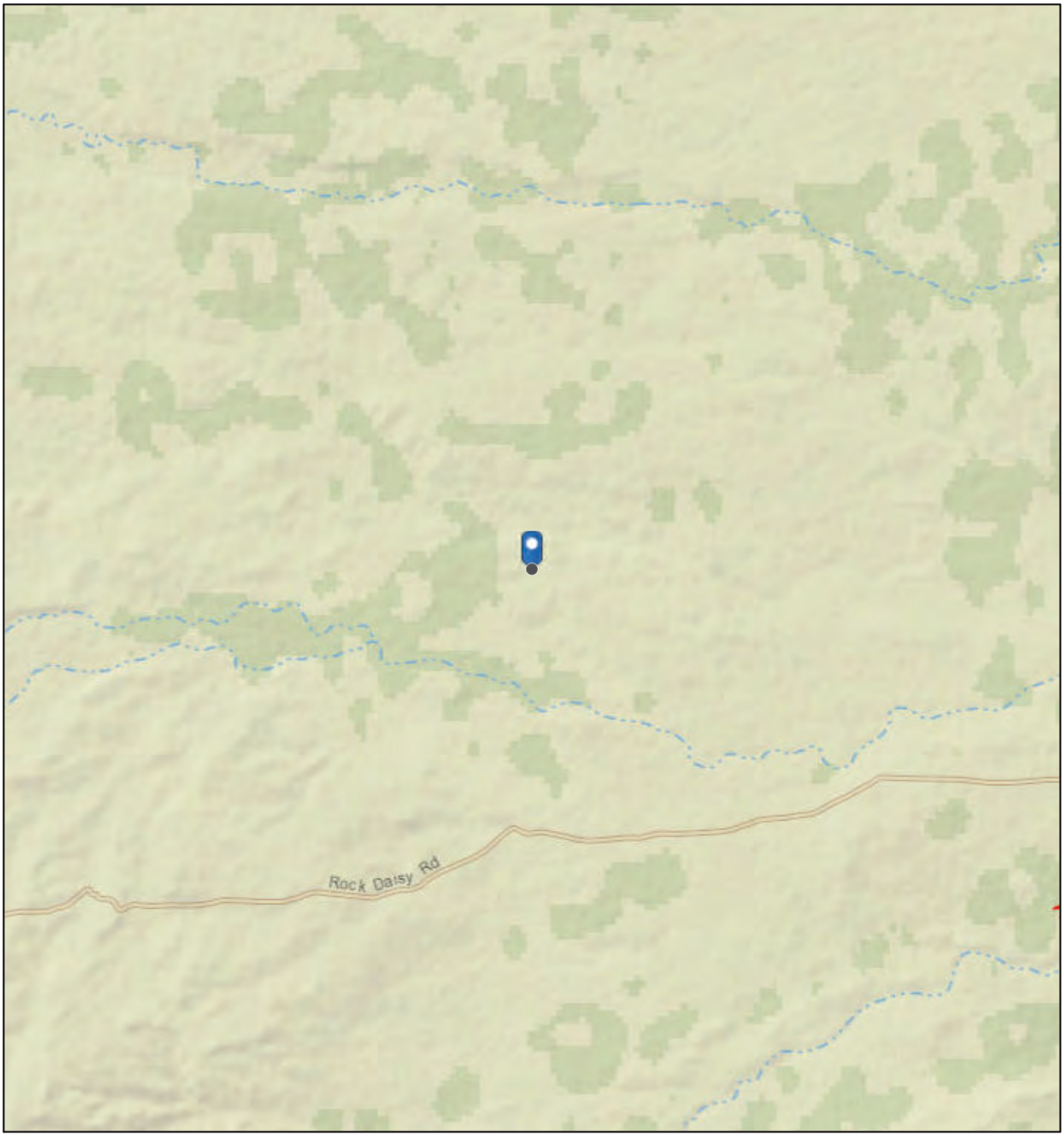
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Routh NU #1 pipeline



6/28/2022, 11:10:44 AM

1:144,448

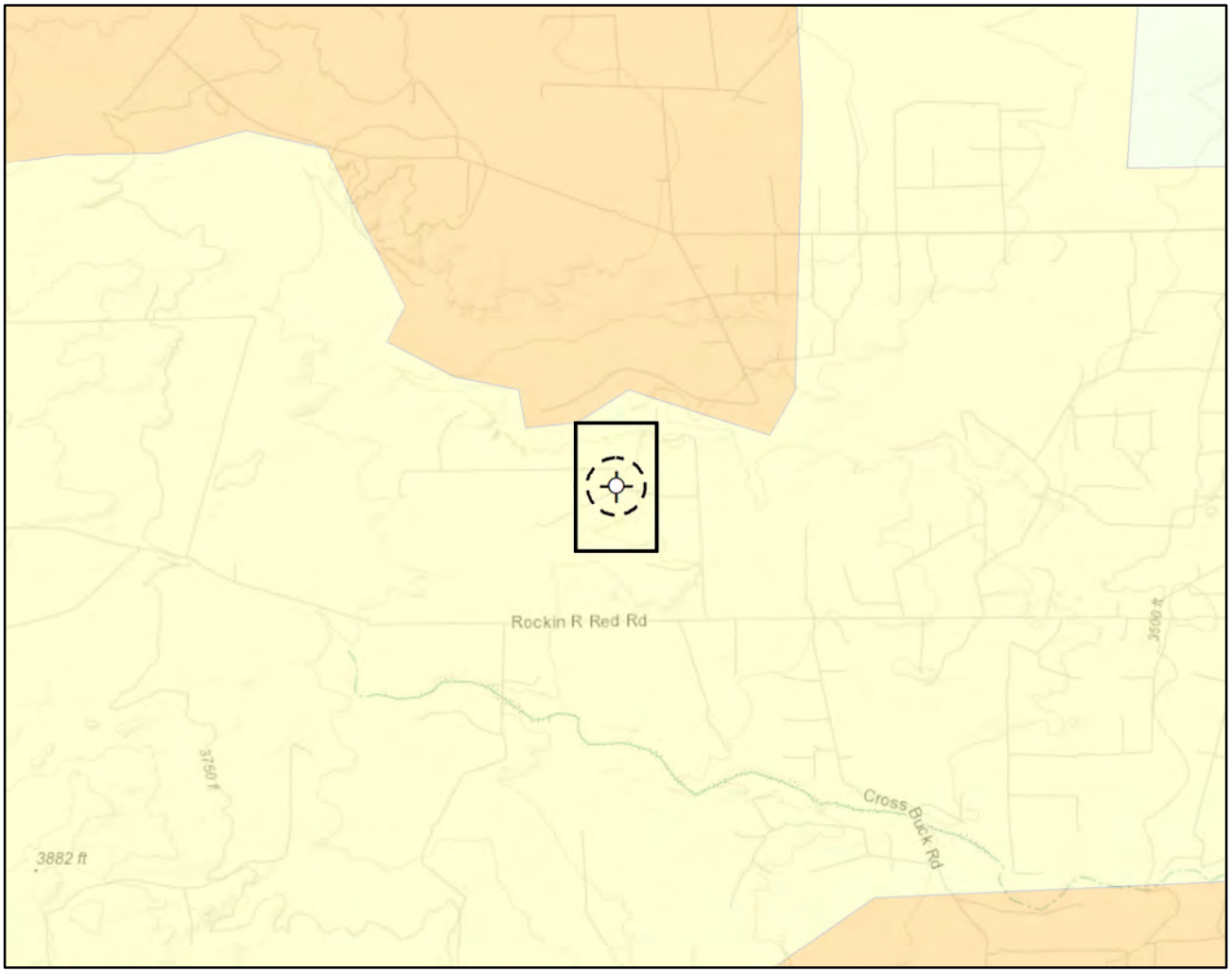
0 1 2 4 mi

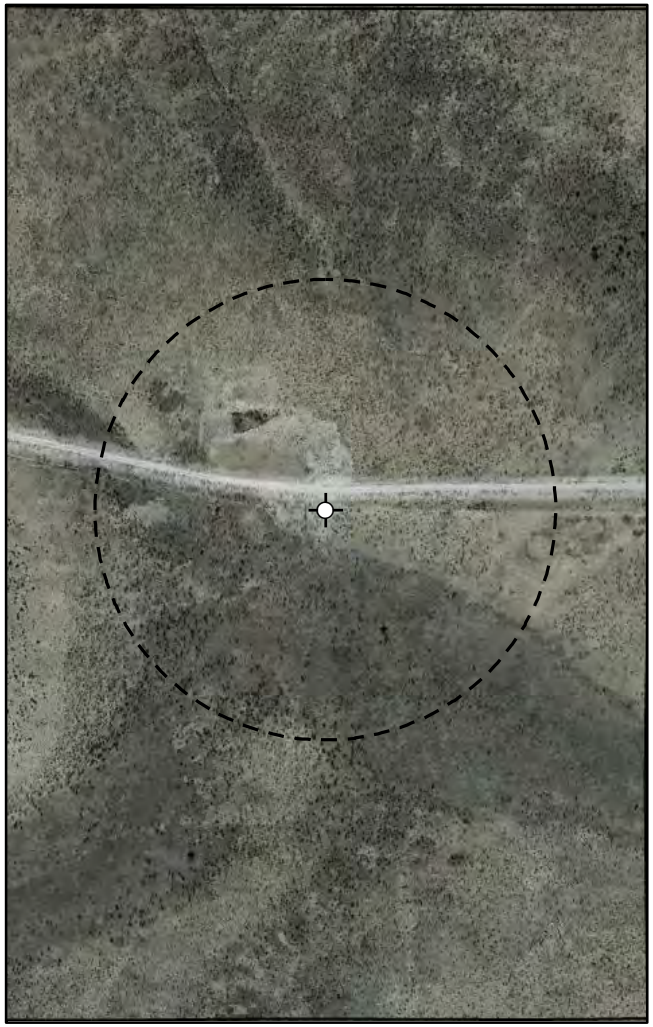
0 1.5 3 6 km

National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

EMNRD MMD GIS Coordinator

EMNRD - Energy, Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappbuilder/index.html?id=7ebfa3c432db42978d66c99a9cc8311a)





Karst Potential

- Critical
- High
- Medium
- Low

- Site Location
- 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: 32.665303, -104.550849

NAD 1983 UTM Zone 13N
Date: Jun 29/22

N

Karst Potential Schematic
Routh NU #1 Pipeline

FIGURE:
X

eogresources

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

Note: Inset Map, ESRI 2018; Overview Map: ESRI World Topographic. Karst potential data sourced from Rosswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management. (2018). Karst Potential.

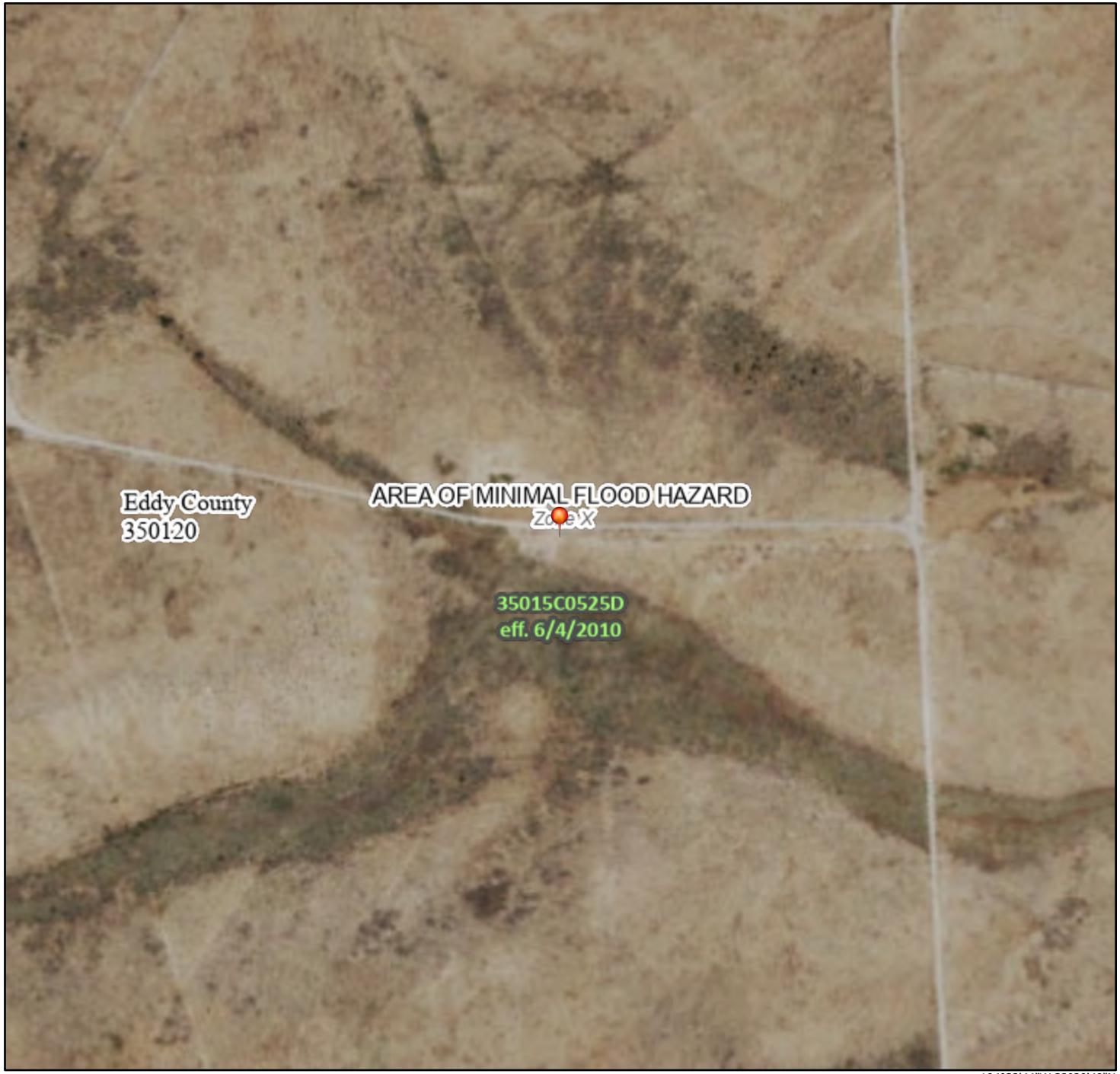
VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716\Routh SWD Tank Battery\Figure X Routh SWD Tank Battery.mxd

National Flood Hazard Layer FIRMette

FEMA

104°33'22"W 32°40'10"N



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

1:6,000

104°32'44"W 32°39'40"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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 Cross Sections with 1% Annual Chance
- 17.5 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

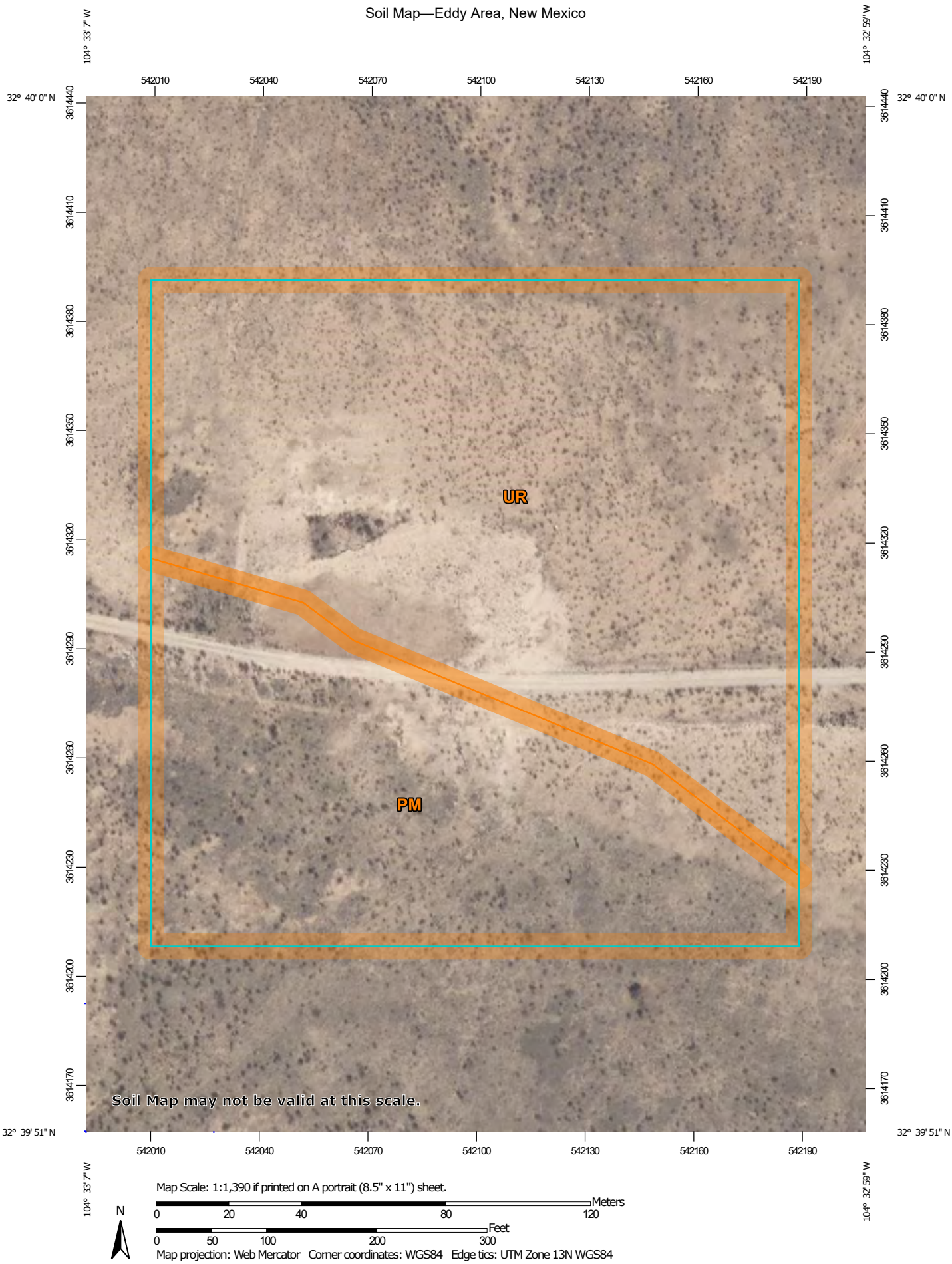
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 6/27/2022 at 6:22 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—Eddy Area, New Mexico



Map Scale: 1:1,390 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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 17, Sep 12, 2021

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

Date(s) aerial images were photographed: Feb 27, 2020—Feb 28, 2020

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
PM	Pima silt loam, 0 to 1 percent slopes	3.1	37.9%
UR	Upton-Reagan complex, 0 to 9 percent slopes	5.1	62.1%
Totals for Area of Interest		**8.1**	**100.0%**

Eddy Area, New Mexico

PM—Pima silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 1w56
Elevation: 600 to 4,200 feet
Mean annual precipitation: 8 to 25 inches
Mean annual air temperature: 60 to 70 degrees F
Frost-free period: 195 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Pima

Setting

Landform: Flood plains, alluvial flats, alluvial fans
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Alluvium

Typical profile

H1 - 0 to 3 inches: silt loam
H2 - 3 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R042XC017NM - Bottomland

Hydric soil rating: No

Minor Components

Dev

Percent of map unit: 1 percent
Ecological site: R042XC017NM - Bottomland
Hydric soil rating: No

Reagan

Percent of map unit: 1 percent
Ecological site: R042XC007NM - Loamy
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 17, Sep 12, 2021

Eddy Area, New Mexico

UR—Upton-Reagan complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1w65
Elevation: 1,100 to 5,400 feet
Mean annual precipitation: 6 to 15 inches
Mean annual air temperature: 60 to 70 degrees F
Frost-free period: 180 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Upton and similar soils: 55 percent
Reagan and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upton

Setting

Landform: Ridges, fans
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 13 inches: gravelly loam
H3 - 13 to 21 inches: cemented
H4 - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R042XC025NM - Shallow
Hydric soil rating: No

Description of Reagan

Setting

Landform: Fan remnants, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
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 content: 40 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R042XC007NM - Loamy
Hydric soil rating: No

Minor Components

Reagan

Percent of map unit: 5 percent
Ecological site: R042XC007NM - Loamy
Hydric soil rating: No

Pima

Percent of map unit: 5 percent
Ecological site: R042XC017NM - Bottomland

Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 17, Sep 12, 2021

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Range

Site ID: R042XC025NM

Site Name: Shallow

Precipitation or Climate Zone: 10 to 13 inches

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:
This site occurs on upland plains, fans and mesas, or between toe slopes of desert hills and drainage ways. Slopes range fro 0 to 15 percent. Direction of slope varies and is usually not significant. Elevations range from 2,842 to 4,500 feet.

Land Form:
1. plain
2. fan
3. mesa

Aspect:
1. Not signifant
2.
3.

	Minimum	Maximum
Elevation (feet)	2,842	4,500
Slope (percent)	0	15
Water Table Depth (inches)	N/A	N/A

Flooding:	Minimum	Maximum
Frequency	N/A	N/A
Duration		

Ponding:	Minimum	Maximum
Depth (inches)	N/A	N/A
Frequency		
Duration		

Runoff Class:
Negligible to High

CLIMATIC FEATURES

Narrative:

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 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. Because of the shallow soil depth, the vegetation on this site can take advantage of moisture almost anytime it falls. Strong winds that blow from the west and southwest blow from January through June, which accelerates soil drying at a critical time for cool season plant growth.

	Minimum	Maximum
Frost-free period (days):	180	221
Freeze-free period (days):	199	240
Mean annual precipitation (inches):	10.0	13.0

Monthly moisture (inches) and temperature (^{0}F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	0.40	0.42	20.6	59.7
February	0.40	0.41	25.2	65.6
March	0.41	0.43	31.4	72.7
April	0.58	0.63	40.4	81.5
May	1.28	1.35	49.6	88.7
June	1.40	1.46	59.1	95.4
July	1.62	1.64	63.3	96.4
August	1.79	1.84	61.6	94.8
September	1.81	2.20	54.1	88.5
October	1.16	1.41	40.7	80.4
November	0.43	0.47	28.4	68.7
December	0.48	0.51	20.9	61.1

Climate Stations:

(1) NM0600, Artesia, NM - Period of record 1961 - 1990
(2) NM0992, Bitter Lakes WL Refuge, NM - Period of record 1961 - 1990
(3) NM1469, Carlsbad, NM - Period of record 1961 - 1990
(4) NM293792, Hagerman, NM - Period of record 1961 - 1990
(5) NM299563, Waste Isolation Plant, NM - Period of record 1961 - 1990
(2) NM4346, Jal, NM - Period of record 1961 - 1990

INFLUENCING WATER FEATURES

Narrative:

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

Wetland description:

System	Subsystem	Class
N/A		

If Riverine Wetland System enter Rosgen Stream Type:

N/A

REPRESENTATIVE SOIL FEATURES

Narrative:

The soils of this site are shallow to very shallow. Surface layers are stony silty clay, gravelly loam and gravelly fine sandy loam. There is an indurated caliche layer of limestone bedrock that occurs within 20 inches and averages less than 10 inches. Permeability is moderate and moderately rapid and water holding capacity is low. All water is stored above the caliche layer in the shallow soil profile.
Characteristic soils are:
Delnorte very gravelly loam
Lozier gravelly loam 0 to 5 percent slopes
Potter gravelly loam
Tencee gravelly fine sandy loam
Upton gravelly loam
Vieja stony silty clay
Kimbrough gravelly loam

Parent Material Kind:	Alluvium
Parent Material Origin:	Mixed

Surface Texture:

1. gravelly loam
2. gravelly fine sandy loam
3. stony silt clay

Surface Texture Modifier:

1. gravel
2.
3.

Subsurface Texture Group:	N/A
Surface Fragments <=3” (% Cover):	15 - 40
Surface Fragments >3” (% Cover):	N/A
Subsurface Fragments <=3” (%Volume):	13 - 42
Subsurface Fragments >=3” (%Volume):	0 - 1

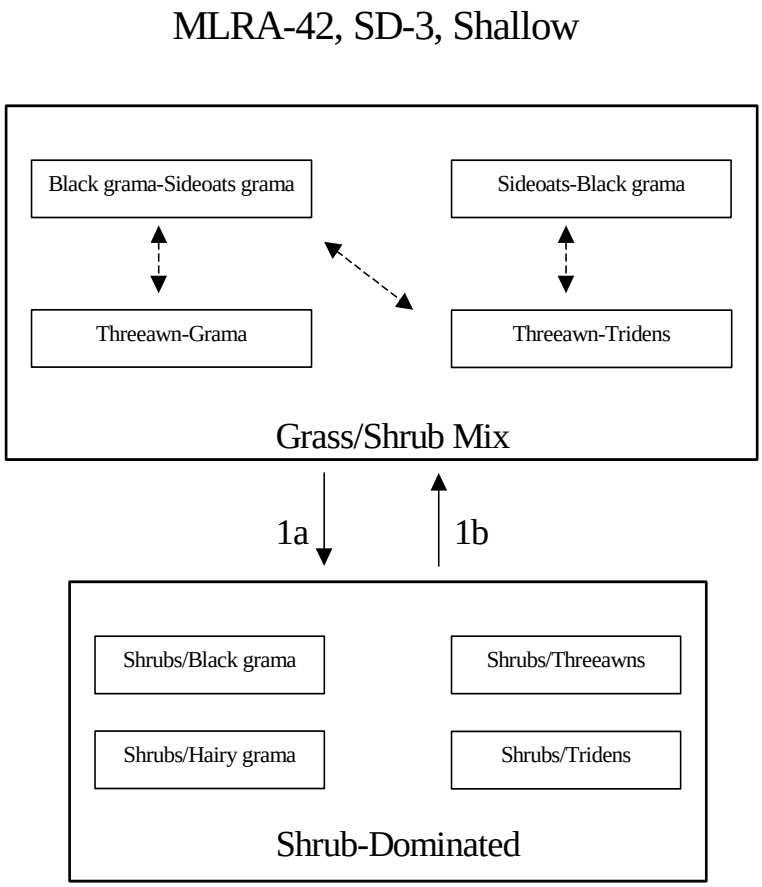
	Minimum	Maximum
Drainage Class:	Well	Well
Permeability Class:	very slow	moderately slow
Depth (inches):	4	24
Electrical Conductivity (mmhos/cm):	0	2
Sodium Absorption Ratio:	N/A	N/A
Soil Reaction (1:1 Water):	7.4	8.4
Soil Reaction (0.1M CaCl2):	N/A	N/A
Available Water Capacity (inches):	1	1
Calcium Carbonate Equivalent (percent):		

Ecological Dynamics of the Site:

Overview

The Shallow site is associated with and Limestone Hills, Loamy, and Shallow Sandy sites. When associated with Limestone Hills, the Shallow site occurs on the summits, foot slopes and toeslopes of hills. Loamy sites often occur as areas between low elongated hills with rounded crests (Shallow site). When the Shallow Sandy site and Shallow site occur in association, the Shallow Sandy soils occupy the tops of low ridges and the Shallow site soils occur on the steeper sideslopes of the ridge. The historic plant community of the Shallow site has the aspect of a grassland/shrub mix, dominated by grasses, but with shrubs common throughout the site. Black grama is the dominant grass species; creosotebush, mesquite, and catclaw mimosa are common shrubs. Overgrazing and or extended drought can reduce grass cover, effect a change in grass species dominance, and may result in a shrub-dominated state. Suppression of natural fire regimes may also facilitate the transition to shrub dominance.[1]

Plant Communities and Transitional Pathways (diagram)



1a. Extended drought, overgrazing, no fire

1b. Brush control, Prescribed grazing

Plant Communities Photo Display & Descriptive Diagnosis

MLRA 42; SD-3; Shallow

Grass/Shrub mix

•Threeawns-black grama community
•Grass recovery following treatment with tebuthiuron
•Transition back to Grass/Shrub mix

Shrub-Dominated

•Creosotebush-catclaw mimosa, with some broom snakeweed and a few scattered mesquite
•Grass cover (hairy tridens-black grama) patchy, large connected bare areas present
•Upton gravelly loam, Eddy Co., NM

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 Narrative Label: HCPC

Plant Community Narrative:

State Containing Historic Climax Plant Community

Grassland/Shrub Mix: The historic plant community is dominated by black grama with sideoats grama as the sub-dominant. Blue grama, hairy grama, bush muhly, and sand dropseed also occur in significant amounts. Sideoats grama can occur as the dominant grass with black grama as sub-dominant on the western side of the Land Resource Unit SD-3. This may be due to higher average elevation on the west side. Retrogression within this state due to extended drought or overgrazing will cause a decrease in species such as black grama, sideoats grama, blue grama, and bush muhly. Threeawns may become the dominant grass species due to a decline in more palatable grasses or because of its ability to quickly recover following drought. Continued loss of grass cover and associated increase in amount of bare ground may result in a shrub-dominated state. Decreased fire frequencies may also be an important component in the cause of this transition.

Diagnosis: Grass cover is fairly uniform, however, surface gravel, cobble, and bare ground make up a large percent of total ground cover, and grass production during unfavorable years may only average 150-175 pounds per acre. Shrubs are common with canopy cover averaging five to ten percent. Evidence of erosion such as rills and gullies are rare, but may occur on slopes greater than eight percent.

Ground Cover (Aveage Percent of Surface Area).

Grasses & Forbs	10 – 15
Bare ground	40 - 60
Surface cobble and stone	15 - 25
Litter (percent)	5 - 8
Litter (average depth in cm.)	2 - 3

Percent canopy cover (trees, shrubs, and half-shrubs	
Trees	0
Shrubs and half -shrubs	5 - 10

Plant Community Annual Production (by plant type):

	Annual Production (lbs/ac)		
Plant Type	Low	RV	High
Grass/Grasslike	168	352	536
Forb	20	42	64
Tree/Shrub/Vine	63	131	200
Lichen			
Moss			
Microbiotic Crusts			
Totals	250	525	800

Plant Community Composition and Group Annual Production: Plant species are grouped by annual production **not** by functional groups.

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	BOER4	black grama	105 – 158	105 - 158
2	BOCU	sideoats grama	79 - 105	79 - 105
3	BOGR2	blue grama	79 - 105	79 - 105
3	BOHI2	hairy grama		
4	MUPO2	bush muhly	26 - 53	26 - 53
5	BOBA3	cane bluestem	16 – 26	16 - 26
6	SPCR	sand dropseed	26 – 53	26 - 53
7	ERPI5	hairy tridens	16 – 26	16 – 26
8	MUAR	ear muhly	5 – 16	5 - 16
9	HENE5	New Mexico feathergrass	5 - 16	5 - 16
10	DAPU7	fluffgrass	5 – 16	5 – 16
11	2GP	other grasses	16 – 26	16 – 26

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
18	RHMI3	littleleaf sumac	5 – 16	5 – 16
19	LATR2	cresostebush	5 – 16	5 – 16
20	KRER	range ratany	5 – 16	5 – 16
21	MIERX	common javalinabush	5 – 16	5 – 16
22	FLCE	American tarbush	5 – 16	5 – 16
23	KOSP	spiny allthorn	5 – 16	5 – 16
24	PRGL2	mesquite	11 – 26	11 – 26
25	MIACB	catclaw mimosa	5 – 16	5 - 16
26	OPUNT	cactus	5 - 16	5 - 16
27	PAIN2	mariola	11 – 26	11 - 26
28	GUSA2	broom snakeweed	5 – 16	5 – 16
29	2SHRUB	other shrubs	16 – 26	16 - 26

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
12	TEACE	stemless actinea	11 – 26	11 – 26
13	PACAL5	wooly groundsel	5 - 16	5 - 16
14	SPHAE	globemallow	5 - 16	5 - 16
15	LESQU	bladderpod	5 - 16	5 - 16
16	CASSI	Senna	5 - 16	5 - 16
17	2FORB	other forbs	11 – 26	11 - 26

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Other grasses that could appear on this site would include: vine-mesquite, silver bluestem, burrograss, spike dropseed, threeawns, tobosa, muhlys, Arizona cottontop and plains bristlegrass

Other woody plants include: condalia, tesajo cactus, Apacheplume, wolfberry, cactus, ephedra spp., yucca, witerfat and fourwing saltbush.

Other forbs include: desert zinnia, wolly paperflower, prickleaf dogweed, verbena, deerstongue, croton and wright's buckwheat.

Plant Growth Curves

Growth Curve ID NM2825

Growth Curve Name: HCPC

Growth Curve Description: SD-3 Shallow HCPC Warm Season Plant Community

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	3	5	10	10	25	30	12	5	0	0

Additional States:

Shrub-Dominated: This state is characterized by an increase in shrubs and a decrease in grass cover relative to grassland/shrub mix. As grass cover decreases shrubs increase, especially creosotebush, catclaw mimosa, whitethorn acacia, and mesquite. Each of these shrub species may become dominant in localized areas or across the site, depending on the spatial variability in soil characteristics and landscape position. Black grama, threeawns, hairy grama, or hairy tridens may be the dominant grass species. Fluffgrass, burrograss and broom snakeweed increase in representation. The Shallow site is resistant to further state change, due to the natural rock armor of the soil and a shallow impermeable layer. The amount of rock fragments on the soil surface assist in retarding erosion. On Shallow sites with low slope, the shallow depth to either a petrocalcic layer or limestone bedrock helps to keep water perched and available to shallow rooted grasses for extended periods. [2]

Diagnosis: Shrubs are the dominant species, especially creosotebush, catclaw mimosa, whitethorn acacia, or mesquite. Grass cover is variable ranging from patchy with large connected bare areas present to sparse with only a limited amount in shrub inter-spaces.

Transition to Shrub-Dominated (1a) Overgrazing and or extended periods of drought, and suppression of natural fire regimes are thought to cause this transition. As grass cover is lost, soil fertility and available soil moisture decline, due to the reduction of organic matter and decreased infiltration.[3] Shrubs have the ability to extract nutrients and water from a greater area of soil than grasses and are better able to utilize limited water. Competition by shrubs for water and nutrients limits grass recruitment and establishment. Fire historically may have played a part in suppressing shrub expansion; fire suppression may therefore facilitate shrub expansion.

Key indicators of approach to transition:

- Decrease or change in composition or distribution of grass cover.
- Increase in size and frequency of bare patches.
- Increase in amount of shrub seedlings.

Transition back to Grassland/Shrub Mix (1b) Brush control is necessary to re-establish grasses. Prescribed grazing will help to ensure proper forage utilization and sustain grass cover.
Once the transition is reversed and grass cover is re-established, prescribed fire might help in maintaining the Grassland/Shrub state.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

This site provides habitats which support a resident animal community that is characterized by desert cottontail, spotted ground squirrel, Merriam's kangaroo rat, cactus mouse, white-throated woodrat, gray fox, spotted skunk, roadrunner, Swainson's hawk, white-necked raven, cactus wren, pyrrhuloxia, lark sparrow, mourning dove, scaled quail, leopard lizard, round-tailed horned lizard, prairie rattlesnake, Couch's spadefoot toad, marbled whiptail, and greater earless lizard.

Where associated with limestone hills, mule deer utilize this site. Where large woody shrubs occur, most resident birds and scissor-tailed flycatcher, morning dove, lark sparrow and Swainson's hawk nest.

Hydrology Functions:

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

Hydrologic Interpretations	
Soil Series	Hydrologic Group
Delnorte	C
Lozier	D
Potter	C
Tencee	D
Upton	C
Kimbrough	D
Vieja	D

Recreational Uses:

This site offers recreation potential for hiking, horseback riding, rock hunting, nature photography and bird hunting and birding. During years of abundant spring moisture, a colorful array of wild flowers is displayed during May and June. A few summer and fall flowers also occur.

Wood Products:

This site has no potential for wood production.

Other Products:

This site is suited for grazing by all kinds and classes of livestock during all seasons of the year. Missmanagement will cause a decrease in black grama, sideoats grama, and blue grama, bush muhly and New Mexico feathergrass. A corresponding increase in bare ground will occur. There will also be an increase in muhlys, fluffgrass, creosotebush, javalinabush and mesquite. This site will respond best 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	3.7 – 4.5
75 – 51	4.3 – 5.5
50 – 26	5.3 – 10.0
25 – 0	10.1 +

Plant Preference by Animal Kind:

	Code	Species Preference	Code
Stems	S	None Selected	N/S
Leaves	L	Preferred	P
Flowers	F	Desirable	D
Fruit/Seeds	F/S	Undesirable	U
Entire Plant	EP	Not Consumed	NC
Underground Parts	UP	Emergency	E
		Toxic	T

Animal Kind: Livestock

Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
black grama	Bouteloua eriopoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
sideoats grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P
blue grama	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
hairy grama	Bouteloua hirsuta	EP	D	D	D	D	P	P	P	P	P	D	D	D
bush muhly	Muhlenbergia porterti	EP	P	P	P	P	P	P	P	P	P	P	P	P
cane bluestem	Bothriochloa barbinodis	EP	U	U	U	U	U	U	P	P	D	U	U	U
sand dropseed	Sporobolus cryptandrus	EP	U	U	U	D	D	D	D	D	D	U	U	U
globemallow	Sphaeralcea	EP	N/S	N/S	N/S	D	D	D	D	D	P	P	P	N/S
bladderpod	Lesquerella	EP	N/S	N/S	D	D	D	D	N/S	N/S	N/S	N/S	N/S	N/S
Senna	Cassia L.	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
cresostebush	Larrea tridentata	L	U	U	U	U	U	U	U	U	U	U	U	U
common javalinabush	Microrhamnus eridoides	EP	U	U	U	U	U	U	U	U	U	U	U	U
American tarbush	Flourensia cernua	EP	U	U	U	U	U	U	U	U	U	U	U	U
mesquite	Prosopis glandulosa	EP	U	U	U	U	U	U	U	U	U	U	U	U
catclaw mimosa	Mimosa aculeaticarpa		U	U	U	U	U	U	U	U	U	U	U	U
cactus	opuntia sp.	EP	E	E	E	E	E	E	E	E	E	E	E	E
mariola	Parthenium incanum	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
broom snakeweed	Gutierrezia sarothrae	L/F	U	U	U	U	U	T	T	U	U	U	U	U

Supporting Information

Associated Sites:

Site Name	Site ID	Site Narrative

Similiar Sites:

Site Name	Site ID	Site Narrative

State Correlation:
This site has been correlated with the following states: Texas

Data Source	Number of Records	Sample Period	State	County

Type Locality:

Relationship to Other Established Classifications:

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 (SD-3). This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.
Characteristic soils are:

Delnorte very gravelly loam	Lozier gravelly loam 0-5% slope	Potter gravelly loam
Tencee gravelly fine sandy loam	Upton gravelly loam	Vieja stony silty clay
Kimgrough gravelly loam		

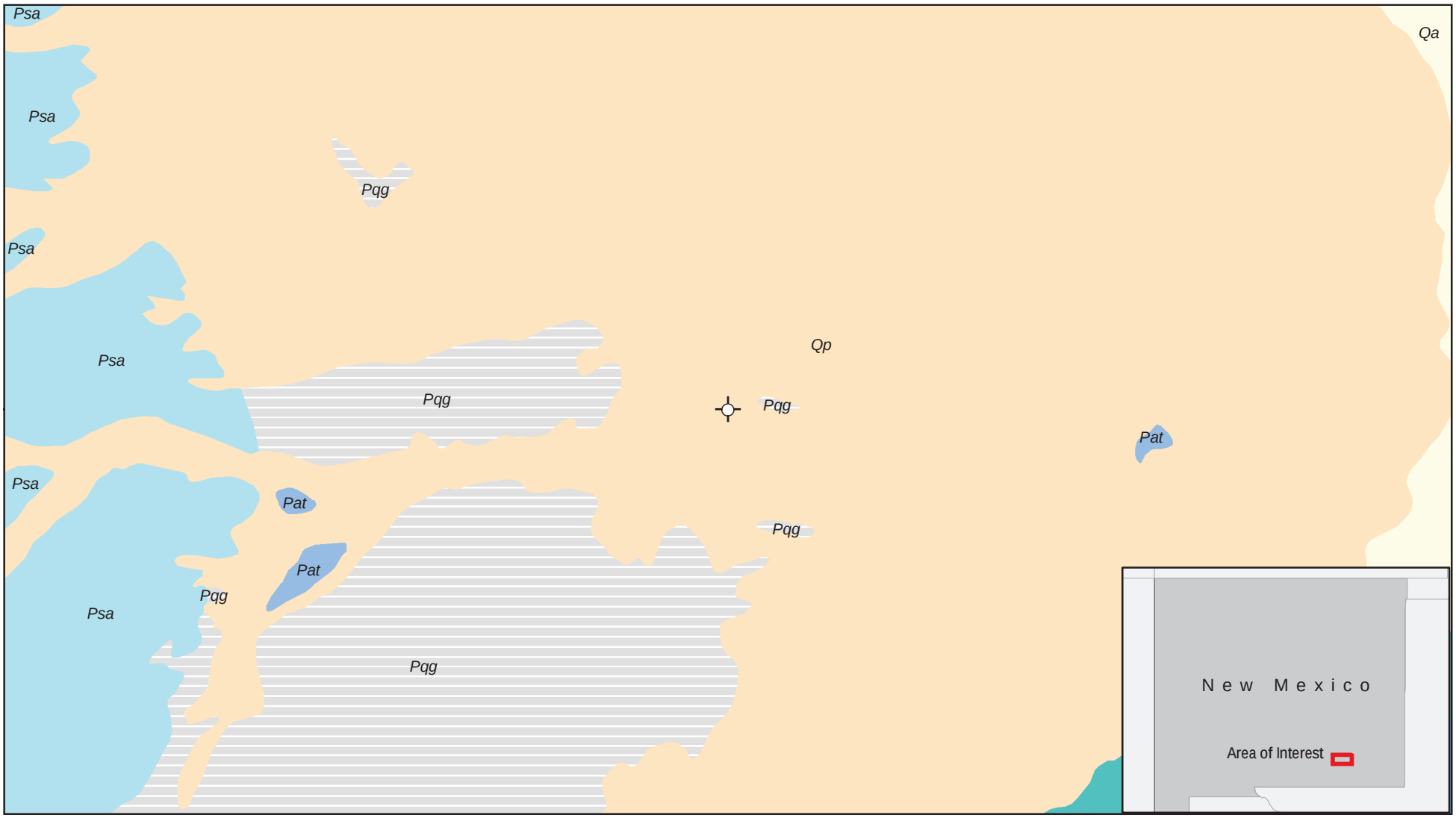
1. Humphrey, R.R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. Fire and ecosystems. New York: Academic Press: 365-400.
2. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. J. Range Manage. 36: 723-726.
3. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheets. Rangeland Soil Quality—Infiltration, Organic Matter, Rangeland Sheets 5,6. [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

Site Description Approval:

Author	Date	Approval	Date
Don Sylvester	07/12/1979	Don Sylvester	07/12/1979

Site Description Revision:

Author	Date	Approval	Date
David Trujillo	03/26/03	George Chavez	03/26/03



Site Location

Lithologic Units

Pat	Psa	Qa	
Pqg	Psr	Qp	
	Pty		

VERTEX

0 1.5 3 Miles

Map Center:
Lat/Long: 34.326031, -105.904176

Date: Jun 30/22

N

New Mexico Geology
Routh NU #1 Pipeline

FIGURE:
G

eog resources

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: Geology data sourced from New Mexico Bureau of Geology & Mineral Resources, Bureau of Land Management.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716Routh SWD Tank Battery\Figure G Geology Routh SWD Tank Battery.mxd

ATTACHMENT 6

From: Chase Settle
To: Michael Moffitt; Monica Peppin
Subject: FW: Routh NU Pipeline (nAPP2223138504) Sampling Notification
Date: August 26, 2022 9:18:04 AM
Attachments: image001.png

From: Tina Huerta <Tina_Huerta@eogresources.com>
Sent: Thursday, August 25, 2022 7:29 AM
To: Alan & Cheryl <ahowell@pvtn.net>; Austin Weyant <austin@atkinseng.com>; Jennifer Nobui <Jennifer.Nobui@state.nm.us>; Jocelyn Harimon <Jocelyn.Harimon@state.nm.us>; Mike Bratcher <mike.bratcher@state.nm.us>; Robert Hamlet <Robert.Hamlet@state.nm.us>
Cc: Andrea Felix <Andrea_Felix@eogresources.com>; Katie Jamison <Katie_Jamison@eogresources.com>; Michael Yemm <Michael_Yemm@eogresources.com>
Subject: RE: Routh NU Pipeline (nAPP2223138504) Sampling Notification

Good Morning,

Re-sending this with correct Incident number. Sorry for any confusion.

Thank you.

From: Tina Huerta <Tina_Huerta@eogresources.com>
Sent: Thursday, August 25, 2022 7:04 AM
To: Alan & Cheryl <ahowell@pvtn.net>; Austin Weyant <austin@atkinseng.com>; Jennifer Nobui <Jennifer.Nobui@state.nm.us>; Jocelyn Harimon <Jocelyn.Harimon@state.nm.us>; Mike Bratcher <mike.bratcher@state.nm.us>; Robert Hamlet <Robert.Hamlet@state.nm.us>
Cc: Andrea Felix <Andrea_Felix@eogresources.com>; Katie Jamison <Katie_Jamison@eogresources.com>; Michael Yemm <Michael_Yemm@eogresources.com>
Subject: Routh NU Pipeline (nAPP2218654480) Sampling Notification

Good Morning,

EOG Resources, Inc. respectfully submits notification of sampling to be conducted at the below location.

Routh NU Pipeline
A-14-19S-24E
Eddy County, NM
nAPP2223138504

Sampling will begin at 8:00 a.m. on Monday, August 29, 2022 and continue through Friday, September 2, 2022.

Thank you,

Tina Huerta
Regulatory Specialist
Direct: 575.748.4168
Cell: 575.703.3121
Email: tina_huerta@eogresources.com

eog resources

Artesia Division

From: Chase Settle
To: Michael Moffitt; Monica Peppin
Subject: FW: Routh NU Pipeline (nAPP2223138504) Sampling notification
Date: September 7, 2022 5:15:51 PM

From: Miriam Morales <Miriam_Morales@eogresources.com>
Sent: Wednesday, September 7, 2022 5:15 PM
To: Jennifer Nobui <Jennifer.Nobui@state.nm.us>; Robert Hamlet <Robert.Hamlet@state.nm.us>; Jocelyn Harimon <jocelyn.harimon@state.nm.us>; Mike Bratcher <mike.bratcher@state.nm.us>; Alan & Cheryl <ahowell@pvtn.net>; Austin Weyant <austin@atkinseng.com>
Cc: Andrea Felix <Andrea_Felix@eogresources.com>; Katie Jamison <Katie_Jamison@eogresources.com>; Michael Yemm <Michael_Yemm@eogresources.com>; Terrence Gant <Terry_Gant@eogresources.com>
Subject: Routh NU Pipeline (nAPP2223138504) Sampling notification

Good afternoon,

EOG Resources, Inc. respectfully submits notification of sampling to be conducted at the below location.

Routh NU Pipeline
A-14-19S-24E; Eddy County, NM
nAPP2223138504

Sampling will begin at 8:00 a.m. on Monday, September 12, 2022 and continue through Friday, September 16, 2022.

Thank you,

Miriam Morales

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

August 12, 2022

Mike Moffitt

EOG
105 South Fourth Street
Artesia, NM 88210
TEL:
FAX:

RE: Routh NU Pipeline OrderNo.: 2208146

Dear Mike Moffitt:

Hall Environmental Analysis Laboratory received 17 sample(s) on 8/3/2022 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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

CLIENT: EOG
Client Sample ID: BH22-01 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:00:00 AM
Lab ID: 2208146-001 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	910	59		mg/Kg	20	8/4/2022 10:12:44 AM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 7:07:59 PM	69240
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/4/2022 7:07:59 PM	69240
Surr: DNOP	78.7	21-129		%Rec	1	8/4/2022 7:07:59 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/4/2022 12:33:00 PM	69230
Surr: BFB	88.9	37.7-212		%Rec	1	8/4/2022 12:33:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 12:33:00 PM	69230
Toluene	ND	0.049		mg/Kg	1	8/4/2022 12:33:00 PM	69230
Ethylbenzene	ND	0.049		mg/Kg	1	8/4/2022 12:33:00 PM	69230
Xylenes, Total	ND	0.098		mg/Kg	1	8/4/2022 12:33:00 PM	69230
Surr: 4-Bromofluorobenzene	81.6	70-130		%Rec	1	8/4/2022 12:33:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-01 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:05:00 AM
Lab ID: 2208146-002 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	4000	150		mg/Kg	50	8/5/2022 3:57:46 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 7:32:24 PM	69240
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/4/2022 7:32:24 PM	69240
Surr: DNOP	84.1	21-129		%Rec	1	8/4/2022 7:32:24 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/4/2022 12:53:00 PM	69230
Surr: BFB	89.9	37.7-212		%Rec	1	8/4/2022 12:53:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/4/2022 12:53:00 PM	69230
Toluene	ND	0.049		mg/Kg	1	8/4/2022 12:53:00 PM	69230
Ethylbenzene	ND	0.049		mg/Kg	1	8/4/2022 12:53:00 PM	69230
Xylenes, Total	ND	0.098		mg/Kg	1	8/4/2022 12:53:00 PM	69230
Surr: 4-Bromofluorobenzene	81.9	70-130		%Rec	1	8/4/2022 12:53:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-01 3ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:10:00 AM
Lab ID: 2208146-003 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	4400	150		mg/Kg	50	8/5/2022 4:10:07 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	13		mg/Kg	1	8/4/2022 7:57:02 PM	69240
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	8/4/2022 7:57:02 PM	69240
Surr: DNOP	93.0	21-129		%Rec	1	8/4/2022 7:57:02 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/4/2022 1:13:00 PM	69230
Surr: BFB	87.6	37.7-212		%Rec	1	8/4/2022 1:13:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.023		mg/Kg	1	8/4/2022 1:13:00 PM	69230
Toluene	ND	0.046		mg/Kg	1	8/4/2022 1:13:00 PM	69230
Ethylbenzene	ND	0.046		mg/Kg	1	8/4/2022 1:13:00 PM	69230
Xylenes, Total	ND	0.092		mg/Kg	1	8/4/2022 1:13:00 PM	69230
Surr: 4-Bromofluorobenzene	82.9	70-130		%Rec	1	8/4/2022 1:13:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-02 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:15:00 AM
Lab ID: 2208146-004 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	650	60		mg/Kg	20	8/4/2022 11:39:36 AM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 8:21:29 PM	69240
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/4/2022 8:21:29 PM	69240
Surr: DNOP	86.6	21-129		%Rec	1	8/4/2022 8:21:29 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/4/2022 1:32:00 PM	69230
Surr: BFB	90.6	37.7-212		%Rec	1	8/4/2022 1:32:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 1:32:00 PM	69230
Toluene	ND	0.047		mg/Kg	1	8/4/2022 1:32:00 PM	69230
Ethylbenzene	ND	0.047		mg/Kg	1	8/4/2022 1:32:00 PM	69230
Xylenes, Total	ND	0.095		mg/Kg	1	8/4/2022 1:32:00 PM	69230
Surr: 4-Bromofluorobenzene	83.2	70-130		%Rec	1	8/4/2022 1:32:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-02 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:20:00 AM
Lab ID: 2208146-005 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	3200	150		mg/Kg	50	8/5/2022 4:22:29 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/4/2022 8:46:06 PM	69240
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/4/2022 8:46:06 PM	69240
Surr: DNOP	91.1	21-129		%Rec	1	8/4/2022 8:46:06 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/4/2022 1:52:00 PM	69230
Surr: BFB	91.5	37.7-212		%Rec	1	8/4/2022 1:52:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 1:52:00 PM	69230
Toluene	ND	0.049		mg/Kg	1	8/4/2022 1:52:00 PM	69230
Ethylbenzene	ND	0.049		mg/Kg	1	8/4/2022 1:52:00 PM	69230
Xylenes, Total	ND	0.098		mg/Kg	1	8/4/2022 1:52:00 PM	69230
Surr: 4-Bromofluorobenzene	82.9	70-130		%Rec	1	8/4/2022 1:52:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-02 3ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:25:00 AM
Lab ID: 2208146-006 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	3200	150		mg/Kg	50	8/5/2022 4:34:49 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 9:10:35 PM	69240
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/4/2022 9:10:35 PM	69240
Surr: DNOP	105	21-129		%Rec	1	8/4/2022 9:10:35 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/4/2022 2:12:00 PM	69230
Surr: BFB	89.5	37.7-212		%Rec	1	8/4/2022 2:12:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 2:12:00 PM	69230
Toluene	ND	0.048		mg/Kg	1	8/4/2022 2:12:00 PM	69230
Ethylbenzene	ND	0.048		mg/Kg	1	8/4/2022 2:12:00 PM	69230
Xylenes, Total	ND	0.097		mg/Kg	1	8/4/2022 2:12:00 PM	69230
Surr: 4-Bromofluorobenzene	80.7	70-130		%Rec	1	8/4/2022 2:12:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-03 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:30:00 AM
Lab ID: 2208146-007 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	ND	60		mg/Kg	20	8/4/2022 12:41:39 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 9:35:15 PM	69240
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/4/2022 9:35:15 PM	69240
Surr: DNOP	92.3	21-129		%Rec	1	8/4/2022 9:35:15 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/4/2022 2:32:00 PM	69230
Surr: BFB	88.9	37.7-212		%Rec	1	8/4/2022 2:32:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/4/2022 2:32:00 PM	69230
Toluene	ND	0.050		mg/Kg	1	8/4/2022 2:32:00 PM	69230
Ethylbenzene	ND	0.050		mg/Kg	1	8/4/2022 2:32:00 PM	69230
Xylenes, Total	ND	0.099		mg/Kg	1	8/4/2022 2:32:00 PM	69230
Surr: 4-Bromofluorobenzene	81.6	70-130		%Rec	1	8/4/2022 2:32:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-03 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:35:00 AM
Lab ID: 2208146-008 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	700	60		mg/Kg	20	8/4/2022 12:54:03 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/4/2022 9:59:47 PM	69240
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/4/2022 9:59:47 PM	69240
Surr: DNOP	66.9	21-129		%Rec	1	8/4/2022 9:59:47 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/4/2022 2:52:00 PM	69230
Surr: BFB	90.6	37.7-212		%Rec	1	8/4/2022 2:52:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 2:52:00 PM	69230
Toluene	ND	0.049		mg/Kg	1	8/4/2022 2:52:00 PM	69230
Ethylbenzene	ND	0.049		mg/Kg	1	8/4/2022 2:52:00 PM	69230
Xylenes, Total	ND	0.098		mg/Kg	1	8/4/2022 2:52:00 PM	69230
Surr: 4-Bromofluorobenzene	82.4	70-130		%Rec	1	8/4/2022 2:52:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-03 3ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:40:00 AM
Lab ID: 2208146-009 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	690	61		mg/Kg	20	8/4/2022 1:06:28 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 10:24:29 PM	69240
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/4/2022 10:24:29 PM	69240
Surr: DNOP	72.8	21-129		%Rec	1	8/4/2022 10:24:29 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/4/2022 3:31:00 PM	69230
Surr: BFB	87.5	37.7-212		%Rec	1	8/4/2022 3:31:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/4/2022 3:31:00 PM	69230
Toluene	ND	0.049		mg/Kg	1	8/4/2022 3:31:00 PM	69230
Ethylbenzene	ND	0.049		mg/Kg	1	8/4/2022 3:31:00 PM	69230
Xylenes, Total	ND	0.099		mg/Kg	1	8/4/2022 3:31:00 PM	69230
Surr: 4-Bromofluorobenzene	81.5	70-130		%Rec	1	8/4/2022 3:31:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-04 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:45:00 AM
Lab ID: 2208146-010 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	ND	60		mg/Kg	20	8/4/2022 1:18:52 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	13		mg/Kg	1	8/4/2022 10:49:02 PM	69240
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	8/4/2022 10:49:02 PM	69240
Surr: DNOP	68.7	21-129		%Rec	1	8/4/2022 10:49:02 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/4/2022 3:51:00 PM	69230
Surr: BFB	86.5	37.7-212		%Rec	1	8/4/2022 3:51:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.023		mg/Kg	1	8/4/2022 3:51:00 PM	69230
Toluene	ND	0.046		mg/Kg	1	8/4/2022 3:51:00 PM	69230
Ethylbenzene	ND	0.046		mg/Kg	1	8/4/2022 3:51:00 PM	69230
Xylenes, Total	ND	0.092		mg/Kg	1	8/4/2022 3:51:00 PM	69230
Surr: 4-Bromofluorobenzene	80.6	70-130		%Rec	1	8/4/2022 3:51:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-04 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:50:00 AM
Lab ID: 2208146-011 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	190	60		mg/Kg	20	8/4/2022 1:31:16 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/4/2022 11:13:39 PM	69240
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/4/2022 11:13:39 PM	69240
Surr: DNOP	92.9	21-129		%Rec	1	8/4/2022 11:13:39 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/4/2022 4:11:00 PM	69230
Surr: BFB	87.7	37.7-212		%Rec	1	8/4/2022 4:11:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 4:11:00 PM	69230
Toluene	ND	0.048		mg/Kg	1	8/4/2022 4:11:00 PM	69230
Ethylbenzene	ND	0.048		mg/Kg	1	8/4/2022 4:11:00 PM	69230
Xylenes, Total	ND	0.095		mg/Kg	1	8/4/2022 4:11:00 PM	69230
Surr: 4-Bromofluorobenzene	80.0	70-130		%Rec	1	8/4/2022 4:11:00 PM	69230

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	Estimated value
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 interference		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

CLIENT: EOG
Client Sample ID: BH22-04 3ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 9:55:00 AM
Lab ID: 2208146-012 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	280	60		mg/Kg	20	8/4/2022 1:43:40 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	13		mg/Kg	1	8/4/2022 11:38:13 PM	69240
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	8/4/2022 11:38:13 PM	69240
Surr: DNOP	58.3	21-129		%Rec	1	8/4/2022 11:38:13 PM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/4/2022 4:30:00 PM	69230
Surr: BFB	89.1	37.7-212		%Rec	1	8/4/2022 4:30:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 4:30:00 PM	69230
Toluene	ND	0.047		mg/Kg	1	8/4/2022 4:30:00 PM	69230
Ethylbenzene	ND	0.047		mg/Kg	1	8/4/2022 4:30:00 PM	69230
Xylenes, Total	ND	0.095		mg/Kg	1	8/4/2022 4:30:00 PM	69230
Surr: 4-Bromofluorobenzene	83.0	70-130		%Rec	1	8/4/2022 4:30:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-05 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 10:00:00 AM
Lab ID: 2208146-013 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	9400	300		mg/Kg	100	8/5/2022 5:11:53 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/5/2022 12:27:19 AM	69240
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/5/2022 12:27:19 AM	69240
Surr: DNOP	72.6	21-129		%Rec	1	8/5/2022 12:27:19 AM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/4/2022 4:50:00 PM	69230
Surr: BFB	86.9	37.7-212		%Rec	1	8/4/2022 4:50:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 4:50:00 PM	69230
Toluene	ND	0.048		mg/Kg	1	8/4/2022 4:50:00 PM	69230
Ethylbenzene	ND	0.048		mg/Kg	1	8/4/2022 4:50:00 PM	69230
Xylenes, Total	ND	0.096		mg/Kg	1	8/4/2022 4:50:00 PM	69230
Surr: 4-Bromofluorobenzene	80.0	70-130		%Rec	1	8/4/2022 4:50:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-05 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 10:05:00 AM
Lab ID: 2208146-014 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	6900	300		mg/Kg	100	8/5/2022 5:24:14 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/5/2022 12:51:56 AM	69240
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/5/2022 12:51:56 AM	69240
Surr: DNOP	86.1	21-129		%Rec	1	8/5/2022 12:51:56 AM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/4/2022 5:10:00 PM	69230
Surr: BFB	86.7	37.7-212		%Rec	1	8/4/2022 5:10:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 5:10:00 PM	69230
Toluene	ND	0.047		mg/Kg	1	8/4/2022 5:10:00 PM	69230
Ethylbenzene	ND	0.047		mg/Kg	1	8/4/2022 5:10:00 PM	69230
Xylenes, Total	ND	0.094		mg/Kg	1	8/4/2022 5:10:00 PM	69230
Surr: 4-Bromofluorobenzene	80.4	70-130		%Rec	1	8/4/2022 5:10:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-05 3ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 10:10:00 AM
Lab ID: 2208146-015 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	4800	300		mg/Kg	100	8/11/2022 4:46:41 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/5/2022 1:16:26 AM	69240
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/5/2022 1:16:26 AM	69240
Surr: DNOP	76.5	21-129		%Rec	1	8/5/2022 1:16:26 AM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/4/2022 5:30:00 PM	69230
Surr: BFB	91.7	37.7-212		%Rec	1	8/4/2022 5:30:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 5:30:00 PM	69230
Toluene	ND	0.048		mg/Kg	1	8/4/2022 5:30:00 PM	69230
Ethylbenzene	ND	0.048		mg/Kg	1	8/4/2022 5:30:00 PM	69230
Xylenes, Total	ND	0.096		mg/Kg	1	8/4/2022 5:30:00 PM	69230
Surr: 4-Bromofluorobenzene	80.9	70-130		%Rec	1	8/4/2022 5:30:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-06 0ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 10:15:00 AM
Lab ID: 2208146-016 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JTT**	
Chloride	250	60		mg/Kg	20	8/4/2022 2:58:08 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/5/2022 1:41:02 AM	69240
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/5/2022 1:41:02 AM	69240
Surr: DNOP	67.8	21-129		%Rec	1	8/5/2022 1:41:02 AM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/4/2022 5:50:00 PM	69230
Surr: BFB	85.0	37.7-212		%Rec	1	8/4/2022 5:50:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/4/2022 5:50:00 PM	69230
Toluene	ND	0.048		mg/Kg	1	8/4/2022 5:50:00 PM	69230
Ethylbenzene	ND	0.048		mg/Kg	1	8/4/2022 5:50:00 PM	69230
Xylenes, Total	ND	0.096		mg/Kg	1	8/4/2022 5:50:00 PM	69230
Surr: 4-Bromofluorobenzene	80.3	70-130		%Rec	1	8/4/2022 5:50:00 PM	69230

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	Estimated value
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 interference		

Analytical Report
Lab Order **2208146**
Date Reported: **8/12/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: EOG
Client Sample ID: BH22-06 2ft
Project: Routh NV Pipeline
Collection Date: 7/29/2022 10:20:00 AM
Lab ID: 2208146-017 **Matrix:** SOIL **Received Date:** 8/3/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	3800	150		mg/Kg	50	8/5/2022 5:48:54 PM	69256
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**	
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/5/2022 2:05:34 AM	69240
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/5/2022 2:05:34 AM	69240
Surr: DNOP	87.0	21-129		%Rec	1	8/5/2022 2:05:34 AM	69240
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/4/2022 6:10:00 PM	69230
Surr: BFB	89.6	37.7-212		%Rec	1	8/4/2022 6:10:00 PM	69230
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.023		mg/Kg	1	8/4/2022 6:10:00 PM	69230
Toluene	ND	0.047		mg/Kg	1	8/4/2022 6:10:00 PM	69230
Ethylbenzene	ND	0.047		mg/Kg	1	8/4/2022 6:10:00 PM	69230
Xylenes, Total	ND	0.094		mg/Kg	1	8/4/2022 6:10:00 PM	69230
Surr: 4-Bromofluorobenzene	81.6	70-130		%Rec	1	8/4/2022 6:10:00 PM	69230

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	Estimated value
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 interference		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2208146**

12-Aug-22

Client: EOG

Project: Routh NV Pipeline

Sample ID: **MB-69256**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **69256**	RunNo: **90047**
Prep Date: **8/4/2022**	Analysis Date: **8/4/2022**	SeqNo: **3209163** Units: **mg/Kg**

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

Sample ID: **LCS-69256**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **69256**	RunNo: **90047**
Prep Date: **8/4/2022**	Analysis Date: **8/4/2022**	SeqNo: **3209165** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.0	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2208146**

12-Aug-22

Client: EOG

Project: Routh NV Pipeline

Sample ID: **LCS-69240**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **69240**	RunNo: **90029**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208875** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	15	50.00	0	101	64.4	127			
Surr: DNOP	5.4		5.000		107	21	129			

Sample ID: **MB-69240**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **69240**	RunNo: **90029**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208877** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	15								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.5		10.00		95.2	21	129			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2208146**

12-Aug-22

Client: EOG

Project: Routh NV Pipeline

Sample ID: **lcs-69230**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **69230**	RunNo: **90038**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208567** 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	96.8	72.3	137			
Surr: BFB	1900		1000		187	37.7	212			

Sample ID: **mb-69230**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69230**	RunNo: **90038**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208568** 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	860		1000		85.8	37.7	212			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Estimated value
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 interference		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2208146**

12-Aug-22

Client: EOG

Project: Routh NV Pipeline

Sample ID: **lcs-69230**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69230**	RunNo: **90038**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208620** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	88.1	80	120			
Toluene	0.89	0.050	1.000	0	88.8	80	120			
Ethylbenzene	0.89	0.050	1.000	0	89.3	80	120			
Xylenes, Total	2.6	0.10	3.000	0	87.8	80	120			
Surr: 4-Bromofluorobenzene	0.82		1.000		82.2	70	130			

Sample ID: **mb-69230**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69230**	RunNo: **90038**
Prep Date: **8/3/2022**	Analysis Date: **8/4/2022**	SeqNo: **3208621** 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	0.80		1.000		79.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Estimated value
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 interference		

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: EOG Work Order Number: 2208146 RcptNo: 1

Received By: Juan Rojas 8/3/2022 7:15:00 AM

Completed By: Sean Livingston 8/3/2022 7:49:42 AM

Reviewed By: KRC 8.03.22

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 ☐
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: JA 8/3/22

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	5.9	Good				
2	2.1	Good				

Chain-of-Custody Record

Client: EOG (vertex)

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 48 hours

Project Name: RouthNU Pipeline

Project #: 22E-00716 - 09

Project Manager: Michael Moffitt

Sampler: Jacob Reta

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 5.9-0=5.9 (°C) 2.1-0=2.1

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. 2208146	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)
7/29	9:00am	Soil	BH22-01 0ft	4oz jar	Ice	001	✓	✓					✓			
	9:05am		BH22-01 2ft			002										
	9:10 am		BH22-01 3ft			003										
	9:15 am		BH22-02 0ft			004										
	9:20 am		BH22-02 2ft			005										
	9:25 am		BH22-02 3ft			006										
	9:30am		BH22-03 0ft			007										
	9:35 am		BH22-03 2ft			008										
	9:40am		BH22-03 3ft			009										
	9:45 am		BH22-04 0ft			010										
	9:50 am		BH22-04 2ft			011										
	9:55 am		BH22-04 3ft			012										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
7/29	4:17	Jacob Reta				
8/2/22	1900			courier	8/3/22	7:15

Remarks: CC Michael Moffitt

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: EOG (Vertex)

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 48 Hrs.

Project Name: Reuth NV Pipeline

Project #: 22E-00716-09

Project Manager: Michael Moffitt

Sampler: Jacob Reta

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp (including CF): 5.9-0=5.9 (°C) 2.1-0=2.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
7/29	10:00 am	Soil	BH22-05 0FT	4oz Jar	ICE	013	✓	✓					✓			
	10:05 am		BH22-05 2FT			014										
	10:10 am		BH22-05 3FT			015										
	10:15 am		BH22-06 0FT			016										
	10:20 am		BH22-06 2FT			017										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
07/29/22	4:17	Jacob Reta				
8/2/22	1900			Courier	8/3/22	7:15

Remarks: CC: Michael Moffitt

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: www.hallenvironmental.com

September 13, 2022

Monica Peppin

Vertex Resources Services, Inc.
3101 Boyd Drive
Carlsbad, NM 88220
TEL: (505) 506-0040
FAX:

RE: Routh NU 1 Pipeline OrderNo.: 2209136

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 9 sample(s) on 9/3/2022 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 **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-02 0-4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 10:45:00 AM
Lab ID: 2209136-001 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 3:07:21 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 3:07:21 PM
Surr: DNOP	86.5	21-129		%Rec	1	9/6/2022 3:07:21 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.1		mg/Kg	1	9/6/2022 12:28:14 PM
Surr: BFB	93.5	37.7-212		%Rec	1	9/6/2022 12:28:14 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.020		mg/Kg	1	9/6/2022 12:28:14 PM
Toluene	ND	0.041		mg/Kg	1	9/6/2022 12:28:14 PM
Ethylbenzene	ND	0.041		mg/Kg	1	9/6/2022 12:28:14 PM
Xylenes, Total	ND	0.082		mg/Kg	1	9/6/2022 12:28:14 PM
Surr: 4-Bromofluorobenzene	90.5	70-130		%Rec	1	9/6/2022 12:28:14 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	480	60		mg/Kg	20	9/6/2022 5:58:50 PM

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	Estimated value
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 interference

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-03 0-4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 10:50:00 AM
Lab ID: 2209136-002 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/7/2022 3:05:35 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/7/2022 3:05:35 PM
Surr: DNOP	93.5	21-129		%Rec	1	9/7/2022 3:05:35 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.5		mg/Kg	1	9/6/2022 12:51:40 PM
Surr: BFB	95.4	37.7-212		%Rec	1	9/6/2022 12:51:40 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.017		mg/Kg	1	9/6/2022 12:51:40 PM
Toluene	ND	0.035		mg/Kg	1	9/6/2022 12:51:40 PM
Ethylbenzene	ND	0.035		mg/Kg	1	9/6/2022 12:51:40 PM
Xylenes, Total	ND	0.069		mg/Kg	1	9/6/2022 12:51:40 PM
Surr: 4-Bromofluorobenzene	92.3	70-130		%Rec	1	9/6/2022 12:51:40 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	310	60		mg/Kg	20	9/6/2022 6:11:15 PM

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	Estimated value
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 interference

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-08 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 10:55:00 AM
Lab ID: 2209136-003 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 9:32:27 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 9:32:27 PM
Surr: DNOP	86.5	21-129		%Rec	1	9/6/2022 9:32:27 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	9/6/2022 1:15:11 PM
Surr: BFB	96.1	37.7-212		%Rec	1	9/6/2022 1:15:11 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.020		mg/Kg	1	9/6/2022 1:15:11 PM
Toluene	ND	0.040		mg/Kg	1	9/6/2022 1:15:11 PM
Ethylbenzene	ND	0.040		mg/Kg	1	9/6/2022 1:15:11 PM
Xylenes, Total	ND	0.080		mg/Kg	1	9/6/2022 1:15:11 PM
Surr: 4-Bromofluorobenzene	91.1	70-130		%Rec	1	9/6/2022 1:15:11 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	2500	150		mg/Kg	50	9/7/2022 11:06:15 AM

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-09 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 11:00:00 AM
Lab ID: 2209136-004 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 9:43:27 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 9:43:27 PM
Surr: DNOP	85.3	21-129		%Rec	1	9/6/2022 9:43:27 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.6		mg/Kg	1	9/6/2022 1:38:39 PM
Surr: BFB	94.7	37.7-212		%Rec	1	9/6/2022 1:38:39 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.018		mg/Kg	1	9/6/2022 1:38:39 PM
Toluene	ND	0.036		mg/Kg	1	9/6/2022 1:38:39 PM
Ethylbenzene	ND	0.036		mg/Kg	1	9/6/2022 1:38:39 PM
Xylenes, Total	ND	0.071		mg/Kg	1	9/6/2022 1:38:39 PM
Surr: 4-Bromofluorobenzene	91.4	70-130		%Rec	1	9/6/2022 1:38:39 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	1900	60		mg/Kg	20	9/6/2022 6:36:04 PM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-10 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 11:05:00 AM
Lab ID: 2209136-005 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 10:05:03 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/6/2022 10:05:03 PM
Surr: DNOP	91.4	21-129		%Rec	1	9/6/2022 10:05:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	2.9		mg/Kg	1	9/6/2022 2:02:10 PM
Surr: BFB	94.6	37.7-212		%Rec	1	9/6/2022 2:02:10 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.014		mg/Kg	1	9/6/2022 2:02:10 PM
Toluene	ND	0.029		mg/Kg	1	9/6/2022 2:02:10 PM
Ethylbenzene	ND	0.029		mg/Kg	1	9/6/2022 2:02:10 PM
Xylenes, Total	ND	0.057		mg/Kg	1	9/6/2022 2:02:10 PM
Surr: 4-Bromofluorobenzene	92.0	70-130		%Rec	1	9/6/2022 2:02:10 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	2200	61		mg/Kg	20	9/6/2022 6:48:29 PM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-11 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 11:10:00 AM
Lab ID: 2209136-006 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 10:16:00 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 10:16:00 PM
Surr: DNOP	96.1	21-129		%Rec	1	9/6/2022 10:16:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	9/6/2022 2:25:43 PM
Surr: BFB	100	37.7-212		%Rec	1	9/6/2022 2:25:43 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.019		mg/Kg	1	9/6/2022 2:25:43 PM
Toluene	ND	0.038		mg/Kg	1	9/6/2022 2:25:43 PM
Ethylbenzene	ND	0.038		mg/Kg	1	9/6/2022 2:25:43 PM
Xylenes, Total	ND	0.075		mg/Kg	1	9/6/2022 2:25:43 PM
Surr: 4-Bromofluorobenzene	92.7	70-130		%Rec	1	9/6/2022 2:25:43 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	2200	150		mg/Kg	50	9/7/2022 11:18:39 AM

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-12 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 11:15:00 AM
Lab ID: 2209136-007 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/6/2022 10:26:55 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/6/2022 10:26:55 PM
Surr: DNOP	89.8	21-129		%Rec	1	9/6/2022 10:26:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	9/6/2022 3:36:29 PM
Surr: BFB	94.1	37.7-212		%Rec	1	9/6/2022 3:36:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.020		mg/Kg	1	9/6/2022 3:36:29 PM
Toluene	ND	0.040		mg/Kg	1	9/6/2022 3:36:29 PM
Ethylbenzene	ND	0.040		mg/Kg	1	9/6/2022 3:36:29 PM
Xylenes, Total	ND	0.079		mg/Kg	1	9/6/2022 3:36:29 PM
Surr: 4-Bromofluorobenzene	90.9	70-130		%Rec	1	9/6/2022 3:36:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	2100	150		mg/Kg	50	9/7/2022 11:31:04 AM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-13 4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 11:20:00 AM
Lab ID: 2209136-008 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/6/2022 10:37:48 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/6/2022 10:37:48 PM
Surr: DNOP	91.0	21-129		%Rec	1	9/6/2022 10:37:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.1		mg/Kg	1	9/6/2022 4:00:05 PM
Surr: BFB	96.7	37.7-212		%Rec	1	9/6/2022 4:00:05 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.015		mg/Kg	1	9/6/2022 4:00:05 PM
Toluene	ND	0.031		mg/Kg	1	9/6/2022 4:00:05 PM
Ethylbenzene	ND	0.031		mg/Kg	1	9/6/2022 4:00:05 PM
Xylenes, Total	ND	0.062		mg/Kg	1	9/6/2022 4:00:05 PM
Surr: 4-Bromofluorobenzene	92.4	70-130		%Rec	1	9/6/2022 4:00:05 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	2700	150		mg/Kg	50	9/7/2022 11:43:29 AM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209136**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-04 0-4'
Project: Routh NU 1 Pipeline **Collection Date:** 9/1/2022 2:00:00 PM
Lab ID: 2209136-009 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/6/2022 10:48:49 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/6/2022 10:48:49 PM
Surr: DNOP	91.3	21-129		%Rec	1	9/6/2022 10:48:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	9/6/2022 4:23:42 PM
Surr: BFB	96.4	37.7-212		%Rec	1	9/6/2022 4:23:42 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.019		mg/Kg	1	9/6/2022 4:23:42 PM
Toluene	ND	0.037		mg/Kg	1	9/6/2022 4:23:42 PM
Ethylbenzene	ND	0.037		mg/Kg	1	9/6/2022 4:23:42 PM
Xylenes, Total	ND	0.075		mg/Kg	1	9/6/2022 4:23:42 PM
Surr: 4-Bromofluorobenzene	92.1	70-130		%Rec	1	9/6/2022 4:23:42 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	680	59		mg/Kg	20	9/6/2022 7:38:06 PM

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	Estimated value
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 interference		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209136**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **MB-69993**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **69993**	RunNo: **90821**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3247576** Units: **mg/Kg**

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

Sample ID: **LCS-69993**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **69993**	RunNo: **90821**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3247577** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209136**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **2209136-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **WES22-02 0-4'** Batch ID: **69977** RunNo: **90816**
Prep Date: **9/6/2022** Analysis Date: **9/6/2022** SeqNo: **3246618** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	32	14	46.00	0	69.7	36.1	154			
Surr: DNOP	3.3		4.600		72.7	21	129			

Sample ID: **2209136-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **WES22-02 0-4'** Batch ID: **69977** RunNo: **90816**
Prep Date: **9/6/2022** Analysis Date: **9/6/2022** SeqNo: **3246619** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	37	15	49.80	0	73.7	36.1	154	13.6	33.9	
Surr: DNOP	3.8		4.980		75.6	21	129	0	0	

Sample ID: **LCS-69977** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69977** RunNo: **90816**
Prep Date: **9/6/2022** Analysis Date: **9/6/2022** SeqNo: **3246620** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	34	15	50.00	0	67.9	64.4	127			
Surr: DNOP	3.5		5.000		69.2	21	129			

Sample ID: **MB-69977** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69977** RunNo: **90816**
Prep Date: **9/6/2022** Analysis Date: **9/6/2022** SeqNo: **3246621** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	15								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.4		10.00		83.5	21	129			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209136**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **mb-69961**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246744** 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	960		1000		95.8	37.7	212			

Sample ID: **lcs-69961**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246836** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	102	72.3	137			
Surr: BFB	2000		1000		197	37.7	212			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209136**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **mb-69961**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246793** 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	0.90		1.000		90.5	70	130			

Sample ID: **LCS-69961**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246794** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	87.8	80	120			
Toluene	0.93	0.050	1.000	0	93.0	80	120			
Ethylbenzene	0.93	0.050	1.000	0	92.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	92.6	80	120			
Surr: 4-Bromofluorobenzene	0.91		1.000		90.5	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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
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: Vertex Resources Services, Inc.

Work Order Number: 2209136

RcptNo: 1

Received By: Tracy Casarrubias 9/3/2022 9:00:00 AM

Completed By: Tracy Casarrubias 9/3/2022 9:33:36 AM

Reviewed By: SR 9/6/22

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 ☐
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: TME 9/3/22

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	1.3	Good	Yes			
2	2.3	Good	Yes			
3	5.3	Good	Yes			
4	5.9	Good	Yes			

Chain-of-Custody Record

Client: Vertex (EOG)

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 24 hour

Project Name: Routh NM #1 Pipeline

Project #: 22E-00716-09

Project Manager: Monica Peppin

Sampler: SPC

On Ice: ☒ Yes ☐ No

# of Coolers: 4

Cooler Temp(including CF): See Checklist (°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. 2209136	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)
9/1	10:45	Soil	WES22-02 0-4'	1 4oz jar	ice	001	✓	✓					✓			
	10:50		WES22-03 0-4'			002										
	10:55		BES22-08 4'			003										
	11:00		BES22-09 4'			004										
	11:05		BES22-10 4'			005										
	11:10		BES22-11 4'			006										
	11:15		BES22-12 4'			007										
	11:20		BES22-13 4'			008										
	14:00		WES22-04 0-4'			009										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
					9/2/22	915
9/2/22	1900			Courier	9/3/22	9:00

Remarks: direct bill EOG

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: www.hallenvironmental.com

September 13, 2022

Monica Peppin

Vertex Resources Services, Inc.
3101 Boyd Drive
Carlsbad, NM 88220
TEL: (505) 506-0040
FAX:

RE: Routh NU 1 Pipeline OrderNo.: 2209138

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 8 sample(s) on 9/3/2022 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 **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-01 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 9:45:00 AM
Lab ID: 2209138-001 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 10:59:55 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 10:59:55 PM
Surr: DNOP	98.2	21-129		%Rec	1	9/6/2022 10:59:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	9/6/2022 4:47:17 PM
Surr: BFB	96.1	37.7-212		%Rec	5	9/6/2022 4:47:17 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.10		mg/Kg	5	9/6/2022 4:47:17 PM
Toluene	ND	0.20		mg/Kg	5	9/6/2022 4:47:17 PM
Ethylbenzene	ND	0.20		mg/Kg	5	9/6/2022 4:47:17 PM
Xylenes, Total	ND	0.40		mg/Kg	5	9/6/2022 4:47:17 PM
Surr: 4-Bromofluorobenzene	91.3	70-130		%Rec	5	9/6/2022 4:47:17 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	4700	150		mg/Kg	50	9/7/2022 11:55:54 AM

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-02 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 9:50:00 AM
Lab ID: 2209138-002 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	470	14		mg/Kg	1	9/7/2022 3:16:23 PM
Motor Oil Range Organics (MRO)	350	47		mg/Kg	1	9/7/2022 3:16:23 PM
Surr: DNOP	87.4	21-129		%Rec	1	9/7/2022 3:16:23 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	19		mg/Kg	5	9/6/2022 5:10:51 PM
Surr: BFB	92.0	37.7-212		%Rec	5	9/6/2022 5:10:51 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.096		mg/Kg	5	9/6/2022 5:10:51 PM
Toluene	ND	0.19		mg/Kg	5	9/6/2022 5:10:51 PM
Ethylbenzene	ND	0.19		mg/Kg	5	9/6/2022 5:10:51 PM
Xylenes, Total	ND	0.38		mg/Kg	5	9/6/2022 5:10:51 PM
Surr: 4-Bromofluorobenzene	87.8	70-130		%Rec	5	9/6/2022 5:10:51 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	4400	150		mg/Kg	50	9/7/2022 12:08:19 PM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-03 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 9:55:00 AM
Lab ID: 2209138-003 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/6/2022 11:22:12 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/6/2022 11:22:12 PM
Surr: DNOP	95.0	21-129		%Rec	1	9/6/2022 11:22:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	19		mg/Kg	5	9/6/2022 5:34:26 PM
Surr: BFB	96.9	37.7-212		%Rec	5	9/6/2022 5:34:26 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.094		mg/Kg	5	9/6/2022 5:34:26 PM
Toluene	ND	0.19		mg/Kg	5	9/6/2022 5:34:26 PM
Ethylbenzene	ND	0.19		mg/Kg	5	9/6/2022 5:34:26 PM
Xylenes, Total	ND	0.38		mg/Kg	5	9/6/2022 5:34:26 PM
Surr: 4-Bromofluorobenzene	93.3	70-130		%Rec	5	9/6/2022 5:34:26 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	3600	150		mg/Kg	50	9/7/2022 12:20:43 PM

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-04 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 10:00:00 AM
Lab ID: 2209138-004 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/6/2022 11:33:23 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2022 11:33:23 PM
Surr: DNOP	92.4	21-129		%Rec	1	9/6/2022 11:33:23 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	9/6/2022 5:57:59 PM
Surr: BFB	95.2	37.7-212		%Rec	5	9/6/2022 5:57:59 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.098		mg/Kg	5	9/6/2022 5:57:59 PM
Toluene	ND	0.20		mg/Kg	5	9/6/2022 5:57:59 PM
Ethylbenzene	ND	0.20		mg/Kg	5	9/6/2022 5:57:59 PM
Xylenes, Total	ND	0.39		mg/Kg	5	9/6/2022 5:57:59 PM
Surr: 4-Bromofluorobenzene	91.4	70-130		%Rec	5	9/6/2022 5:57:59 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	4900	300		mg/Kg	100	9/7/2022 12:33:08 PM

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-05 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 10:05:00 AM
Lab ID: 2209138-005 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	730	14		mg/Kg	1	9/7/2022 3:37:49 PM
Motor Oil Range Organics (MRO)	490	48		mg/Kg	1	9/7/2022 3:37:49 PM
Surr: DNOP	124	21-129		%Rec	1	9/7/2022 3:37:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	19		mg/Kg	5	9/6/2022 6:21:35 PM
Surr: BFB	93.1	37.7-212		%Rec	5	9/6/2022 6:21:35 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.095		mg/Kg	5	9/6/2022 6:21:35 PM
Toluene	ND	0.19		mg/Kg	5	9/6/2022 6:21:35 PM
Ethylbenzene	ND	0.19		mg/Kg	5	9/6/2022 6:21:35 PM
Xylenes, Total	ND	0.38		mg/Kg	5	9/6/2022 6:21:35 PM
Surr: 4-Bromofluorobenzene	89.5	70-130		%Rec	5	9/6/2022 6:21:35 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	10000	300		mg/Kg	100	9/7/2022 12:45:33 PM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-06 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 10:10:00 AM
Lab ID: 2209138-006 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/6/2022 11:55:29 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/6/2022 11:55:29 PM
Surr: DNOP	98.0	21-129		%Rec	1	9/6/2022 11:55:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.1		mg/Kg	1	9/6/2022 6:45:09 PM
Surr: BFB	96.4	37.7-212		%Rec	1	9/6/2022 6:45:09 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.016		mg/Kg	1	9/6/2022 6:45:09 PM
Toluene	ND	0.031		mg/Kg	1	9/6/2022 6:45:09 PM
Ethylbenzene	ND	0.031		mg/Kg	1	9/6/2022 6:45:09 PM
Xylenes, Total	ND	0.063		mg/Kg	1	9/6/2022 6:45:09 PM
Surr: 4-Bromofluorobenzene	93.4	70-130		%Rec	1	9/6/2022 6:45:09 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	4800	300		mg/Kg	100	9/7/2022 12:57:58 PM

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	Estimated value
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 interference

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES22-07 4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 10:15:00 AM
Lab ID: 2209138-007 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	9/7/2022 12:06:31 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/7/2022 12:06:31 AM
Surr: DNOP	96.2	21-129		%Rec	1	9/7/2022 12:06:31 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.5		mg/Kg	1	9/6/2022 7:08:42 PM
Surr: BFB	96.0	37.7-212		%Rec	1	9/6/2022 7:08:42 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.018		mg/Kg	1	9/6/2022 7:08:42 PM
Toluene	ND	0.035		mg/Kg	1	9/6/2022 7:08:42 PM
Ethylbenzene	ND	0.035		mg/Kg	1	9/6/2022 7:08:42 PM
Xylenes, Total	ND	0.071		mg/Kg	1	9/6/2022 7:08:42 PM
Surr: 4-Bromofluorobenzene	93.2	70-130		%Rec	1	9/6/2022 7:08:42 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	3700	150		mg/Kg	50	9/7/2022 1:35:13 PM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209138**
Date Reported: **9/13/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-01 0-4'
Project: Routh NU 1 Pipeline **Collection Date:** 8/31/2022 10:20:00 AM
Lab ID: 2209138-008 **Matrix:** MEOH (SOIL) **Received Date:** 9/3/2022 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/7/2022 12:17:34 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/7/2022 12:17:34 AM
Surr: DNOP	95.8	21-129		%Rec	1	9/7/2022 12:17:34 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	9/6/2022 8:19:06 PM
Surr: BFB	95.1	37.7-212		%Rec	1	9/6/2022 8:19:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.020		mg/Kg	1	9/6/2022 8:19:06 PM
Toluene	ND	0.040		mg/Kg	1	9/6/2022 8:19:06 PM
Ethylbenzene	ND	0.040		mg/Kg	1	9/6/2022 8:19:06 PM
Xylenes, Total	ND	0.079		mg/Kg	1	9/6/2022 8:19:06 PM
Surr: 4-Bromofluorobenzene	92.3	70-130		%Rec	1	9/6/2022 8:19:06 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	1100	60		mg/Kg	20	9/6/2022 9:42:15 PM

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	Estimated value
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 interference		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209138**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **MB-69993**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **69993**	RunNo: **90821**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3247576** Units: **mg/Kg**

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

Sample ID: **LCS-69993**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **69993**	RunNo: **90821**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3247577** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209138**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **LCS-69977**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **69977**	RunNo: **90816**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246620** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	34	15	50.00	0	67.9	64.4	127			
Surr: DNOP	3.5		5.000		69.2	21	129			

Sample ID: **MB-69977**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **69977**	RunNo: **90816**
Prep Date: **9/6/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246621** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	15								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.4		10.00		83.5	21	129			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209138**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **mb-69961**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246744** 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	960		1000		95.8	37.7	212			

Sample ID: **lcs-69961**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246836** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	102	72.3	137			
Surr: BFB	2000		1000		197	37.7	212			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209138**

13-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NU 1 Pipeline

Sample ID: **mb-69961**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246793** 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	0.90		1.000		90.5	70	130			

Sample ID: **LCS-69961**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69961**	RunNo: **90809**
Prep Date: **9/4/2022**	Analysis Date: **9/6/2022**	SeqNo: **3246794** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	87.8	80	120			
Toluene	0.93	0.050	1.000	0	93.0	80	120			
Ethylbenzene	0.93	0.050	1.000	0	92.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	92.6	80	120			
Surr: 4-Bromofluorobenzene	0.91		1.000		90.5	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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
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: Vertex Resources Services, Inc.

Work Order Number: 2209138

RcptNo: 1

Received By: Tracy Casarrubias 9/3/2022 9:00:00 AM

Completed By: Tracy Casarrubias 9/3/2022 9:35:38 AM

Reviewed By:

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 ☐
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: TMC 9/3/22

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	1.3	Good	Yes			
2	2.3	Good	Yes			
3	5.3	Good	Yes			
4	5.9	Good	Yes			

Chain-of-Custody Record

Client: Vertex (EOG)

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 24 hour

Project Name: Routh NU #1 Pipeline

Project #: 22E-00716-09

Project Manager: Monica Peppin

Sampler: SPC

On Ice: ☒ Yes ☐ No

# of Coolers: 4

Cooler Temp(including CF): See Checklist (°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. 2209138
8/31	9:45	Soil	BES22-01 4'	1 4oz jar	ice	001
	9:50		BES22-02 4'			002
	9:55		BES22-03 4'			003
	10:00		BES22-04 4'			004
	10:05		BES22-05 4'			005
	10:10		BES22-06 4'			006
	10:15		BES22-07 4'			007
	10:20		~~B~~WES22-01 0-4'			008

Analysis Request

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)
✓	✓					✓			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
					9/2/22	915
9/2/22	1900				9/3/22	9:00

Remarks: direct bill EOG

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: www.hallenvironmental.com

September 20, 2022

Michael Moffitt

Vertex Resources Services, Inc.
3101 Boyd Drive
Carlsbad, NM 88220
TEL: (505) 506-0040
FAX

RE: Routh NM 1 Pipeline OrderNo.: 2209622

Dear Michael Moffitt:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/14/2022 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 **2209622**
Date Reported: **9/20/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-01 0-4'
Project: Routh NM 1 Pipeline **Collection Date:** 9/12/2022 3:15:00 PM
Lab ID: 2209622-001 **Matrix:** MEOH (SOIL) **Received Date:** 9/14/2022 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/14/2022 12:19:14 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/14/2022 12:19:14 PM
Surr: DNOP	85.9	21-129		%Rec	1	9/14/2022 12:19:14 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.1		mg/Kg	1	9/14/2022 1:39:11 PM
Surr: BFB	89.4	37.7-212		%Rec	1	9/14/2022 1:39:11 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.021		mg/Kg	1	9/14/2022 1:39:11 PM
Toluene	ND	0.041		mg/Kg	1	9/14/2022 1:39:11 PM
Ethylbenzene	ND	0.041		mg/Kg	1	9/14/2022 1:39:11 PM
Xylenes, Total	ND	0.083		mg/Kg	1	9/14/2022 1:39:11 PM
Surr: 4-Bromofluorobenzene	84.9	70-130		%Rec	1	9/14/2022 1:39:11 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	360	60		mg/Kg	20	9/15/2022 2:35:58 AM

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	Estimated value
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 interference		

Analytical Report
Lab Order **2209622**
Date Reported: **9/20/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES22-04 0-4'
Project: Routh NM 1 Pipeline **Collection Date:** 9/12/2022 3:20:00 PM
Lab ID: 2209622-002 **Matrix:** MEOH (SOIL) **Received Date:** 9/14/2022 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	9/14/2022 12:29:59 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/14/2022 12:29:59 PM
Surr: DNOP	90.9	21-129		%Rec	1	9/14/2022 12:29:59 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	9/14/2022 2:02:45 PM
Surr: BFB	92.7	37.7-212		%Rec	1	9/14/2022 2:02:45 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	9/14/2022 2:02:45 PM
Toluene	ND	0.045		mg/Kg	1	9/14/2022 2:02:45 PM
Ethylbenzene	ND	0.045		mg/Kg	1	9/14/2022 2:02:45 PM
Xylenes, Total	ND	0.090		mg/Kg	1	9/14/2022 2:02:45 PM
Surr: 4-Bromofluorobenzene	87.1	70-130		%Rec	1	9/14/2022 2:02:45 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	290	60		mg/Kg	20	9/15/2022 2:48:23 AM

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	Estimated value
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 interference		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2209622**
20-Sep-22

Client: Vertex Resources Services, Inc.
Project: Routh NM 1 Pipeline

Sample ID: **MB-70185** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **70185** RunNo: **91050**
Prep Date: **9/14/2022** Analysis Date: **9/14/2022** SeqNo: **3256602** Units: **mg/Kg**

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

Sample ID: **LCS-70185** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **70185** RunNo: **91050**
Prep Date: **9/14/2022** Analysis Date: **9/14/2022** SeqNo: **3256603** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.0	90	110			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209622**

20-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NM 1 Pipeline

Sample ID: **LCS-70160** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **70160** RunNo: **91028**
Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255495** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	3.4		5.000		68.7	21	129			

Sample ID: **LCS-70166** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **70166** RunNo: **91028**
Prep Date: **9/14/2022** Analysis Date: **9/14/2022** SeqNo: **3255496** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	15	50.00	0	100	64.4	127			
Surr: DNOP	5.1		5.000		103	21	129			

Sample ID: **MB-70160** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **70160** RunNo: **91028**
Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255498** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.5		10.00		85.5	21	129			

Sample ID: **MB-70166** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **70166** RunNo: **91028**
Prep Date: **9/14/2022** Analysis Date: **9/14/2022** SeqNo: **3255499** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	15								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.0		10.00		80.4	21	129			

Sample ID: **LCS-70156** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **70156** RunNo: **91028**
Prep Date: **9/13/2022** Analysis Date: **9/15/2022** SeqNo: **3256969** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.2		5.000		84.0	21	129			

Sample ID: **MB-70156** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **70156** RunNo: **91028**
Prep Date: **9/13/2022** Analysis Date: **9/15/2022** SeqNo: **3256975** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.3		10.00		83.3	21	129			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2209622**
20-Sep-22

Client: Vertex Resources Services, Inc.
Project: Routh NM 1 Pipeline

Sample ID: **mb** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **G91017** RunNo: **91017**
Prep Date: Analysis Date: **9/14/2022** SeqNo: **3255829** 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	930		1000		92.5	37.7	212			

Sample ID: **2.5ug gro lcs** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **G91017** RunNo: **91017**
Prep Date: Analysis Date: **9/14/2022** SeqNo: **3255830** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	99.1	72.3	137			
Surr: BFB	1900		1000		186	37.7	212			

Sample ID: **mb-70138** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **70138** RunNo: **91017**
Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255835** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	900		1000		90.2	37.7	212			

Sample ID: **lcs-70138** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **70138** RunNo: **91017**
Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255836** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1900		1000		190	37.7	212			

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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2209622**

20-Sep-22

Client: Vertex Resources Services, Inc.

Project: Routh NM 1 Pipeline

Sample ID: **mb** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **B91017** RunNo: **91017**

Prep Date: Analysis Date: **9/14/2022** SeqNo: **3255864** 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	0.87		1.000		86.8	70	130			

Sample ID: **100ng btex lcs** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **B91017** RunNo: **91017**

Prep Date: Analysis Date: **9/14/2022** SeqNo: **3255865** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.025	1.000	0	89.1	80	120			
Toluene	0.93	0.050	1.000	0	92.7	80	120			
Ethylbenzene	0.92	0.050	1.000	0	91.6	80	120			
Xylenes, Total	2.7	0.10	3.000	0	91.4	80	120			
Surr: 4-Bromofluorobenzene	0.88		1.000		87.9	70	130			

Sample ID: **mb-70138** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **70138** RunNo: **91017**

Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255870** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.86		1.000		86.4	70	130			

Sample ID: **LCS-70138** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **70138** RunNo: **91017**

Prep Date: **9/13/2022** Analysis Date: **9/14/2022** SeqNo: **3255871** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.90		1.000		90.5	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 interference
B	Analyte detected in the associated Method Blank
E	Estimated value
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: Vertex Resources Services, Inc.

Work Order Number: 2209622

RcptNo: 1

Received By: Tracy Casarrubias 9/14/2022 7:40:00 AM

Completed By: Tracy Casarrubias 9/14/2022 8:25:24 AM

Reviewed By: 9-14-22

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: jna 9/14/22

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	3.9	Good	Yes			
2	0.8	Good	Yes			

Chain-of-Custody Record

Client: Vertex (EOG)

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 24 hour

Project Name: Routh NU #1 Pipeline

Project #: 22E-00716-09

Project Manager: Michael Moffitt

Sampler: SPC

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 3.9 -0 = 3.9 (°C)
0.0 -0 = 0.0

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. 2209622	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)
9/12	15:15	Soil	WES22-01 0-4'	1 4oz jar	ice	001	✓	✓					✓			
	15:20	"	WES22-04 0-4'	"	"	002	✓	✓					✓			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9/12	17:16	Sally Carthar			9/13/22	1300
9/13/22	1900				9/14/22	7:40

Remarks: direct bill EOG

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

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 148015

CONDITIONS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 148015
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	12/28/2022