VERTEX

April 25, 2023 Vertex Project #: 23E-01490

Spill Closure Report: Irish Hills Pipeline – Area 2
Unit D, Section 7, Township 19 South, Range 25 East
API: 30-015-23326
County: Eddy
Incident Report: nAPP2307639252

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

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

EOG Resources, Inc. (EOG) retained Vertex Resource Services Inc. (Vertex) to conduct an assessment and remediation for a historically impacted area that was identified on March 17, 2023, east of the Irish Hills Pipeline site on the same pipeline, identified as Irish Hills Pipeline – Area 2 (hereafter referred to as "Irish Hills"). EOG submitted a C-141 Release Notification (Attachment 1) to New Mexico Oil Conservation Division (NMOCD) District 2 on March 17, 2023. Incident ID number nAPP2307639252 was assigned to this incident.

This letter provides a description of the incident assessment and remediation activities and demonstrates that closure criteria established in Table I of *19.15.29.12 New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) are being met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NMOCD for the closure of this incident, with the understanding that remediation of the site was conducted in a manner to achieve the requirements of 19.15.29.13.

Incident Description

On March 17, 2023, Vertex investigated and determined there was reportable contamination at the site. The date and time of the incident are undetermined with an unknown volume. The area displaying impact was along the pipeline right-of-way, which had returned to native rangeland.

Site Characterization

The site is located at 32.68282° N, 104.52318° W approximately 8.5 miles northwest of Seven Rivers, New Mexico (Google Inc., 2023). The legal location for the site is Section 7, Township 19 South, Range 25 East in Eddy County, New Mexico. The incident area is located on private property. An aerial photograph and site schematic are included in Attachment 2. This location is located within the Permian Basin in southeast New Mexico and was historically used for oil and gas exploration and production, and rangeland.

Irish Hills was typical of historical oil and gas exploration and production sites on the western portion of the Permian Basin and was used for oil and gas production and transport. The following sections specifically describe the incident area in the pastureland (Attachment 2 – Figure 1).

The surrounding landscape occurs on ridges and fans with elevations ranging between 1,100 and 4,400 feet. The climate is semiarid with average annual precipitation ranging between 7 and 15 inches. Using information obtained from the United States Department of Agriculture, the dominant vegetation was determined to be primarily black grama with creosote bush, mesquite, and catclaw mimosa as the common shrubs (United States Department of Agriculture, Natural Resources Conservation Service, 2023).

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2023) indicates the site's surface geology is comprised primarily of Qp - Piedmont alluvial deposits (Holocene to lower Pleistocene). The predominant soil texture on the site is Loamy. The Natural Resources Conservation Service *Web Soil Survey* characterizes the predominant soil texture on the site as Reagan-Upton association and Upton gravelly loam. It tends to be well drained with high to low runoff and very low to moderate available moisture levels in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2023).

There is no surface water located at Irish Hills. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC (New Mexico Oil Conservation Division, 2018), is the Pecos River located approximately 9.34 miles southeast of the site (Google Inc., 2023). There are no continuous flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest depth to groundwater information to Irish Hills is a monitoring well located approximately 0.41 miles north of the site (New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2023). Data from the New Mexico Office of the State Engineer indicates that the well was dry at 105 feet below ground surface (bgs). Information pertaining to groundwater determination is included in Attachment 4.

Closure Criteria Determination

Using site characterization information, a closure criteria determination worksheet (Attachment 4) was completed to determine if the release was subject to any of the special case scenarios outlined in Paragraph (4) of Subsection C 0f 19.15.29.12 NMAC. The nearest groundwater data is less than 25 years old and located less than 0.5 miles from the release site; therefore, the depth to groundwater can accurately be determined. The closure criteria for the site is determined to associated with the following constituent concentration limits (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

DTGW – Depth to groundwater

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

BTEX – Benzene, toluene, ethylbenzene, and xylenes

Remedial Actions

On August 1, 2022, EOG contracted Vertex to complete delineation assessment of an impacted area, presented on Figure 1 (Attachment 2), through field screening procedures at Irish Hills. The initial inspection and site characterization activities at Irish Hills were completed by Vertex on August 2 and 4, 2022. Initial characterization sample locations are presented on Figure 2 (Attachment 2) and laboratory results are presented in Table 2 (Attachment 3).

Remediation efforts began on March 17, 2023, and were completed on April 3, 2023. Contaminated areas were excavated using data from the initial investigation by Vertex. Horizontal delineation of the impacted area was completed during the remediation with the top 4 feet of each wall sample being under NMOCD's strictest closure criteria.

Vertex personnel supervised the excavation of impacted soils. Field screening consisted of analysis using a photoionization detector (volatile hydrocarbons), Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and electric conductivity (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 included in Attachment 3, as well as in the Daily Field Reports in Attachment 5.

Notifications that confirmatory samples were being collected were provided to the NMOCD before every sampling event and 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 22 five-point confirmatory 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 3 and the laboratory data report is included in Attachment 7. All confirmatory samples collected and analyzed were below the closure criteria for the site.

Closure Request

Vertex recommends no additional remediation action to address the incident at Irish Hills. Laboratory analyses of confirmation samples collected at Irish Hills show final confirmatory values below NMOCD remediation closure criteria for areas where depth to groundwater is greater than 100 feet, with the top 4 feet meeting reclamation requirements of NMAC 19.15.29.13. Laboratory analysis and field screening results are included in Table 3 (Attachment 3). There are no anticipated risks to human, ecological, or hydrological receptors associated with the release site.

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

Vertex and EOG request that this incident (nAPP2307639252) be closed as all requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. EOG certifies that all information in this report and the attachments is correct and that they have complied with the applicable closure requirements and conditions specified in Division rules and directives to meet NMOCD requirements to obtain closure of this release.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 575.988.1472 or cdixon@vertex.ca.

Sally Carttar — 4/25/2023

Sally Carttar, B.A. — Date
INT. ENVIRONMENTAL TECHNOLOGIST, REPORTING

Chance Dixon — 4/25/2023

Chance Dixon, B.Sc. — Date
PROJECT MANAGER, REPORT REVIEW

Attachments

Attachment 1. NMOCD C-141 Report
Attachment 2. Figures
Attachment 3. Tables
Attachment 4. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
Attachment 5. Daily Field Reports with Photographs
Attachment 6. Required 48-Hour Notification of Confirmatory Sampling to Regulatory Agencies
Attachment 7. Laboratory Data Report and Chain of Custody Form

References

Google Inc. (2023). *Google Earth Pro (Version 7.3.3)* [Software]. Retrieved from https://earth.google.com

New Mexico Bureau of Geology and Mineral Resources. (2023). *Interactive Geologic Map*. Retrieved from http://geoinfo.nmt.edu

New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2023). *Well Log/Meter Information Report*. Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/meterReport.html

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

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United States Department of Agriculture, Natural Resources Conservation Service. (2023*). Web Soil Survey, New Mexico*. Retrieved from http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/Chugg%20et%20al%201971%20w-map.pdf

United States Department of Homeland Security, FEMA Flood Map Service Center. (2010). *Flood Map Number 35015C1875D.* Retrieved from https://msc.fema.gov/portal/search?AddressQuery=malaga%20new%20mexico#searchresultsanchor

United States Department of the Interior, Bureau of Land Management. (2018) *New Mexico Cave/Karsts.* Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico

United States Fish and Wildlife Service. (2023). *National Wetland Inventory Surface Waters and Wetland*. Retrieved from https://www.fws.gov/wetlands/data/mapper.html

Limitations

This report has been prepared for the sole benefit of EOG Resources, Inc. (EOG). 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. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

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

ATTACHMENT 1

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	nAPP2307639252
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 # *nAPP2307639252*
Contact mailing address 104 S. 4th Street, Artesia, NM 88210	

Location of Release Source

Latitude 32.68282 Longitude -104.52318
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Irish Hill Pipeline- Area 2	Site Type Pipeline
Date Release Discovered 03/17/2023	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
B	7	19S	25E	Eddy

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

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: Notification of possible historical impacts was provided by the private surface owner for an area adjacent to the Irish Hills Pipeline remediation site. An environmental consultant was retained to perform an assessment of the area. Based on the consultant's initial assessment, on 03/17/2023 a recommendation was provided by the consultant that notification be provided through C-141 submission as it is possible that the release could have been above the reportable threshold.

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2307639252
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: 03/17/2023

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

OCD Only

Received by: Jocelyn Harimon Date: 03/20/2023

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 198312

CONDITIONS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 198312
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	3/20/2023

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2307639252
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?	>100 (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

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2307639252
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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: 4/20/2023

email: Chase_Settle@eogresources.com Telephone: 575-703-6537

OCD Only

Received by: Jocelyn Harimon Date: 04/25/2023

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2307639252
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: 4/20/2023

email: Chase_Settle@eogresources.com Telephone: 575-703-6537

OCD Only

Received by: Jocelyn Harimon Date: 04/25/2023

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: 09/13/2023

Printed Name: Jocelyn Harimon Title: Environmental Specialist

ATTACHMENT 2

Borehole

Approximate Release Area (790.4 sq. ft.)

VERTEX

0 10 20 ft.

Map Center:
Lat/Long: 32.682792, -104.523128

WGS 1984 UTM Zone 13N
Date: Apr 17/23

N

Characterization Schematic
Irish Hills 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: Background imagery from ESRI, 2021. All other data from field survey by Vertex Professional Services, 2022.

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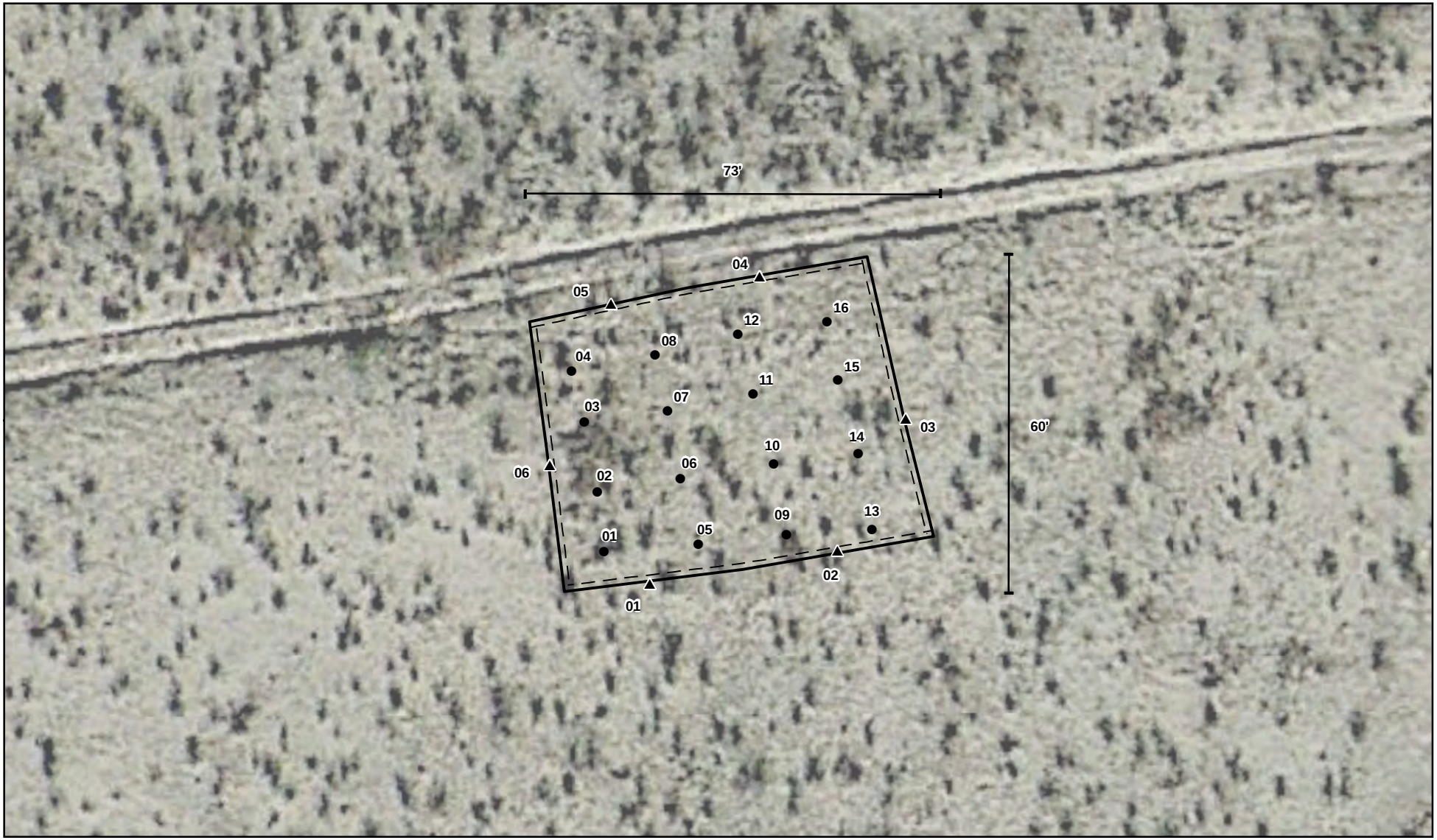
Document Path: G:\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716 (Howell Ranch Reclamation Projects)\002 - Irish Hills Pipeline\Figure 1 Characterization Schematic (Irish Hills Pipeline).mxd



● Base Sample (Prefixed By "BES23-") ▲ Wall Sample (Prefixed By "WES23-") Excavation to 4' (~3,162 sq.ft.)

VERTEX

0 10 20 30 ft.

Map Center:
Lat/Long: 32.682752, -104.523153

NAD 1983 UTM Zone 13N
Date: Apr 11/23

N

Confirmation Schematic
Irish Hills Area 2

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 2019. Features from GPS. Vertex Professional Services Ltd., 2023.

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Document Path: G:\1-Projects_US PROJECT S\EOG Resources Inc\23E-01490\Figure 2 Confirmation Schematic Irish Hills Area 2(23E-01490).mxd

ATTACHMENT 3

Client Name: EOG Resources, Inc.
Site Name: Irish Hills Pipeline
NMOCD Tracking #: nAB1811529351, 2RP-4710
Project #: 22E-00716-02
Lab Reports: 2208251, 2208416, 2208417

Table 2. Initial Characterization 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	16	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	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	63
	4	August 2, 2022	-	-	2,528	ND	ND	ND	ND	ND	ND	ND	1100
BH22-02	0	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 3, 2022	0	-	320	ND	ND	ND	ND	ND	ND	ND	240
	4	August 3, 2022	0	-	2,871	ND	ND	ND	ND	ND	ND	ND	760
BH22-03	0	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4	August 2, 2022	-	-	1,935	ND	ND	ND	ND	ND	ND	ND	930
BH22-04	0	August 2, 2022	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 3, 2022	0	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4	August 3, 2022	0	-	203	ND	ND	ND	ND	ND	ND	ND	ND
BH22-12	0	August 4, 2022	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 4, 2022	0	-	1,560	ND	ND	ND	ND	ND	ND	ND	930
	4	August 4, 2022	0	-	2,138	ND	ND	ND	ND	ND	ND	ND	1400
BH22-14	0	August 4, 2022	0	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
	2	August 4, 2022	0	-	2,862	ND	ND	ND	ND	ND	ND	ND	1000
	4	August 4, 2022	0	-	1,945	ND	ND	ND	ND	ND	ND	ND	1000

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

Table 3. Confirmatory Sample Field Screen and Laboratory Results - Depth to Groundwater >100 Feet BGS (Reclamation)														
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)
WES23-01	0-4'	03/28/2023	13	-	483	ND	ND	ND	ND	ND	ND	ND	ND
WES23-02	0-4'	03/28/2023	0	-	132	ND	ND	ND	ND	ND	ND	ND	ND
WES23-03	0-4'	03/28/2023	0	-	128	ND	ND	ND	ND	ND	ND	ND	ND
WES23-04	0-4'	03/28/2023	0	-	258	ND	ND	ND	ND	ND	ND	ND	ND
WES23-05	0-4'	03/28/2023	0	-	301	ND	ND	ND	ND	ND	ND	ND	ND
WES23-06	0-4'	03/28/2023	0	-	456	ND	ND	ND	ND	ND	ND	ND	ND
BES23-01	4'	03/28/2023	5	-	497	ND	ND	ND	ND	ND	ND	ND	ND
BES23-02	4'	03/28/2023	0	-	487	ND	ND	ND	ND	ND	ND	ND	ND
BES23-03	4'	03/28/2023	0	-	487	ND	ND	ND	ND	ND	ND	ND	ND
BES23-04	4'	03/28/2023	0	-	448	ND	ND	ND	ND	ND	ND	ND	ND
BES23-05	4'	03/28/2023	0	-	512	ND	ND	ND	ND	ND	ND	ND	ND
BES23-06	4'	03/28/2023	0	-	483	ND	ND	ND	ND	ND	ND	ND	ND
BES23-07	4'	03/28/2023	0	-	477	ND	ND	ND	ND	ND	ND	ND	ND
BES23-08	4'	03/28/2023	0	-	492	ND	ND	ND	ND	ND	ND	ND	ND
BES23-09	4'	03/28/2023	5	-	535	ND	ND	ND	ND	ND	ND	ND	ND
BES23-10	4'	03/28/2023	0	-	477	ND	ND	ND	ND	ND	ND	ND	62
BES23-11	4'	03/28/2023	0	-	483	ND	ND	ND	ND	ND	ND	ND	62
BES23-12	4'	03/28/2023	0	-	368	ND	ND	ND	ND	ND	ND	ND	ND
BES23-13	4'	03/28/2023	0	-	477	ND	ND	ND	ND	ND	ND	ND	ND
BES23-14	4'	03/28/2023	0	-	544	ND	ND	ND	ND	ND	ND	ND	ND
BES23-15	4'	03/28/2023	0	-	492	ND	ND	ND	ND	ND	ND	ND	ND
BES23-16	4'	03/28/2023	0	-	464	ND	ND	ND	ND	ND	ND	ND	ND

"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed

ATTACHMENT 4

Closure Criteria Worksheet			
Site Name: Irish Hills Pipeline Area 2			
Spill Coordinates:		X: 32.68282	Y: -104.52318
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	**105**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	49,315	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	4,733	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	9,412	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**		feet
	ii) Within 1000 feet of any fresh water well or spring	2,191	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	4,114	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	>500	year
11	Soil Type	Reagan	
12	Ecological Classification	Reagan-Upton Association	
13	Geology	Qp	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	>100'	<50' 51-100' >100'

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

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

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

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

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
RA 13243 POD 1	RA	ED	4	3	3	06	19S	25E	544060	3616318	668	105		
RA 03959	RA	ED		2	4	12	19S	24E	543589	3615225*	1518	545	265	280
RA 05331	RA	ED	1	1	4	05	19S	25E	546308	3616955*	1740	460	305	155
RA 06436	RA	ED	3	1	4	12	19S	24E	543083	3615122*	1981		300	
RA 06418	RA	ED	1	2	3	17	19S	25E	545925	3613710*	2795	120	72	48
RA 04426	RA	CH		4	3	18	19S	25E	544412	3613201*	3049	715		
RA 04335	RA	CH		1	1	32	18S	25E	545580	3619275*	3159	400	300	100
RA 13230 POD 1	RA	ED	4	2	2	14	19S	24E	542086	3614287	3277	105		
RA 08148	RA	ED	3	3	1	36	18S	24E	542252	3618748*	3525	508		
RA 05333	RA	ED		2	2	09	19S	25E	548430	3616046*	3711	315	260	55
RA 11654 POD1	RA	ED		3	2	19	19S	25E	544959	3612514	3727	500		
RA 11061 POD1	RA	ED		4	2	35	18S	24E	541949	3618852*	3814	450	364	86
RA 04726	RA	ED		3	2	19	19S	25E	544825	3612390*	3845	390	310	80
RA 05900	RA	ED		2	2	16	19S	25E	548442	3614424*	4135	185	95	90
RA 13117 POD1	RA	ED	3	4	1	24	19S	24E	542743	3612369	4342		102	
RA 13117 POD2	RA	ED	3	4	1	24	19S	24E	542730	3612364	4353		102	
RA 03960	RA	ED		2	2	10	19S	24E	540341	3616025*	4387	440	335	105
RA 08146	RA	ED	4	4	3	28	18S	25E	547693	3619576*	4470	400		
RA 13122 POD1	RA	ED	1	3	2	21	19S	25E	547935	3612424	4983			

Average Depth to Water: **234 feet**
Minimum Depth: **72 feet**
Maximum Depth: **364 feet**

Record Count: 19

UTMNAD83 Radius Search (in meters):

Easting (X): 544723.35 **Northing (Y):** 3616234.31 **Radius:** 5000

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

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	Tws	Rng	X	Y
NA	RA 13243 POD 1	4	3	3	06	19S	25E	544060	3616318

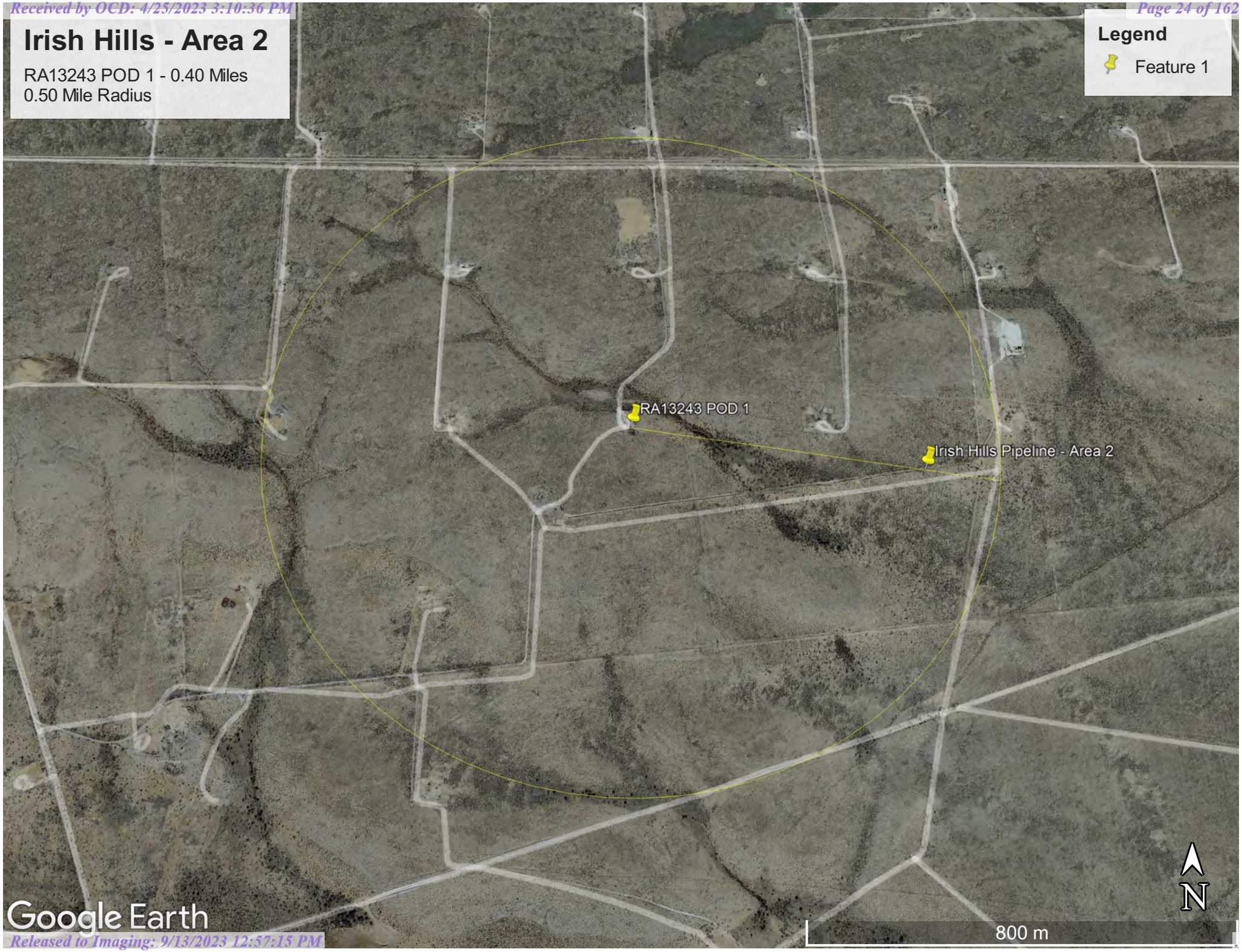
Driller License: 1670 **Driller Company:** HARRISON & COOPER, INC. (WD-1670)
Driller Name: KENNY COOPER

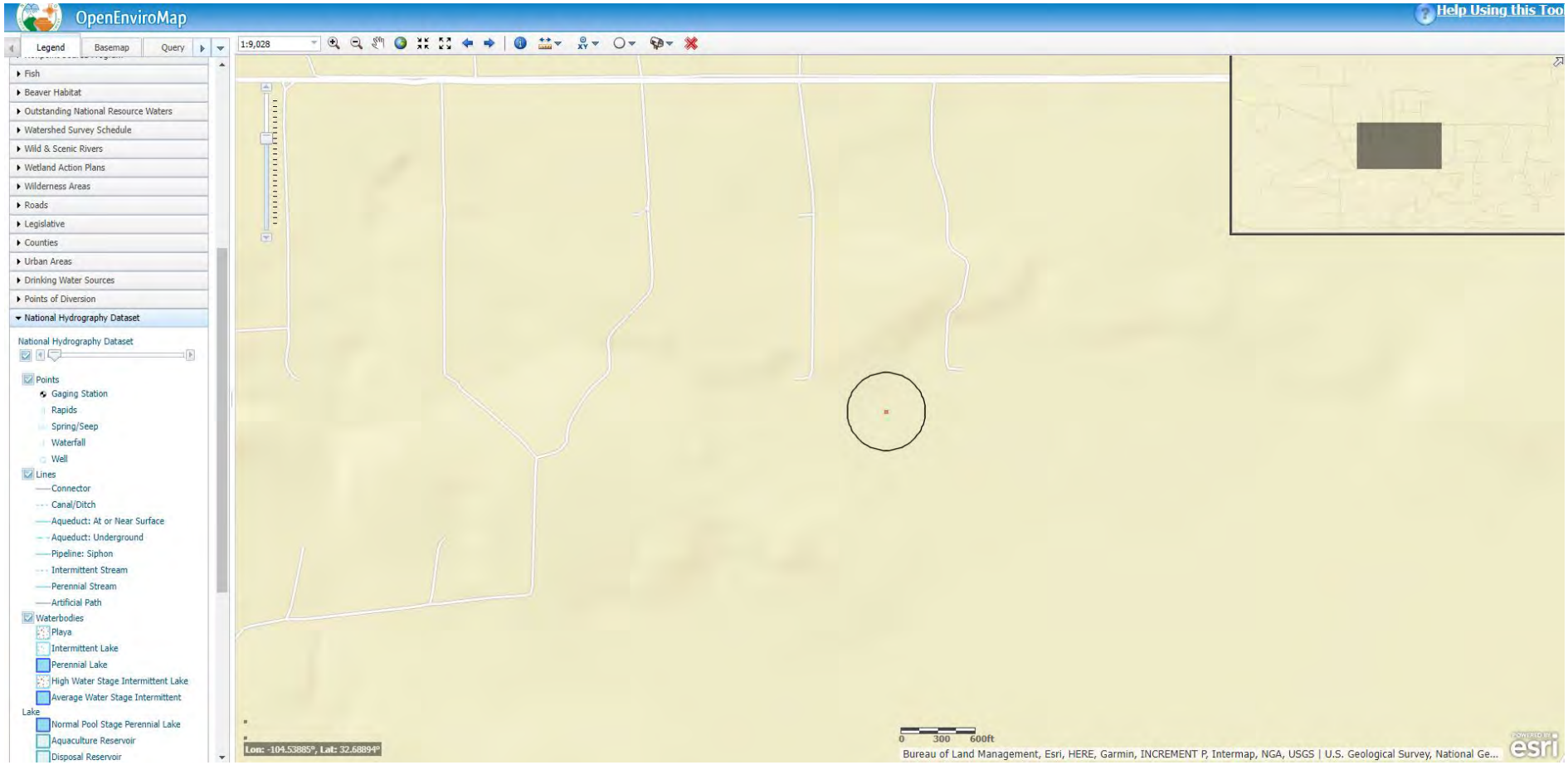
Drill Start Date:	09/26/2022	**Drill Finish Date:**	09/26/2022	**Plug Date:**	
Log File Date:	12/09/2022	**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:		**Depth Well:**	105 feet	**Depth Water:**	

Casing Perforations:	Top	Bottom
	95	105

Irish Hills - Area 2

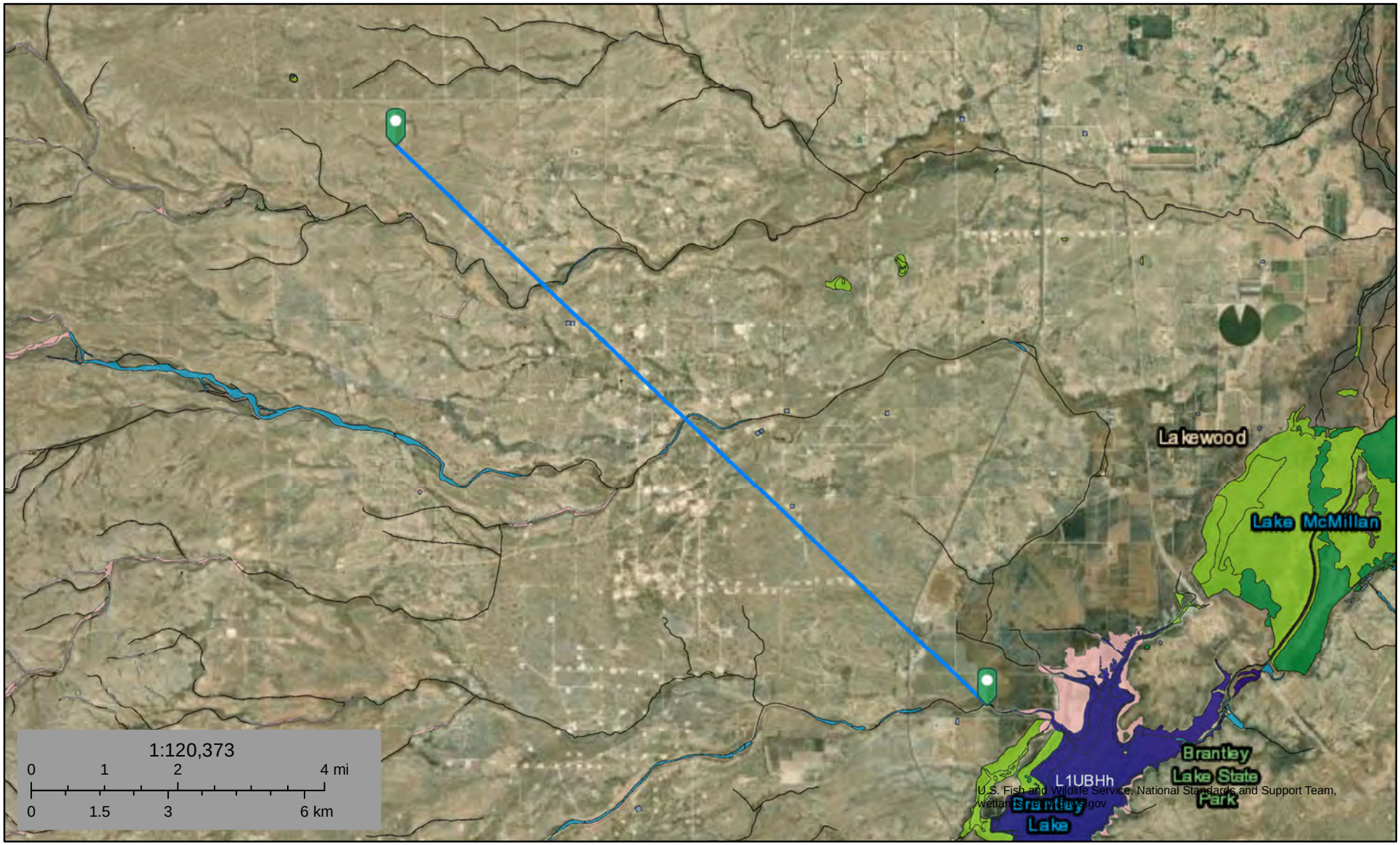
RA13243 POD 1 - 0.40 Miles
0.50 Mile Radius




OpenEnviroMap
Help Using this Too
Legend
Basemap
Query
1:9,028
Fish
Beaver Habitat
Outstanding National Resource Waters
Watershed Survey Schedule
Wild & Scenic Rivers
Wetland Action Plans
Wilderness Areas
Roads
Legislative
Counties
Urban Areas
Drinking Water Sources
Points of Diversion
National Hydrography Dataset
National Hydrography Dataset
Points
Gaging Station
Rapids
Spring/Seep
Waterfall
Well
Lines
Connector
Canal/Ditch
Aqueduct: At or Near Surface
Aqueduct: Underground
Pipeline: Siphon
Intermittent Stream
Perennial Stream
Artificial Path
Waterbodies
Playa
Intermittent Lake
Perennial Lake
High Water Stage Intermittent Lake
Average Water Stage Intermittent Lake
Normal Pool Stage Perennial Lake
Aquaculture Reservoir
Disposal Reservoir
Lon: -104.53885°, Lat: 32.68894°
0 300 600ft
Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, Intermap, NGA, USGS | U.S. Geological Survey, National Ge...
esri

U.S. Fish and Wildlife Service
National Wetlands Inventory

Irish Hills watercourse 9.34 miles



January 31, 2023

Wetlands

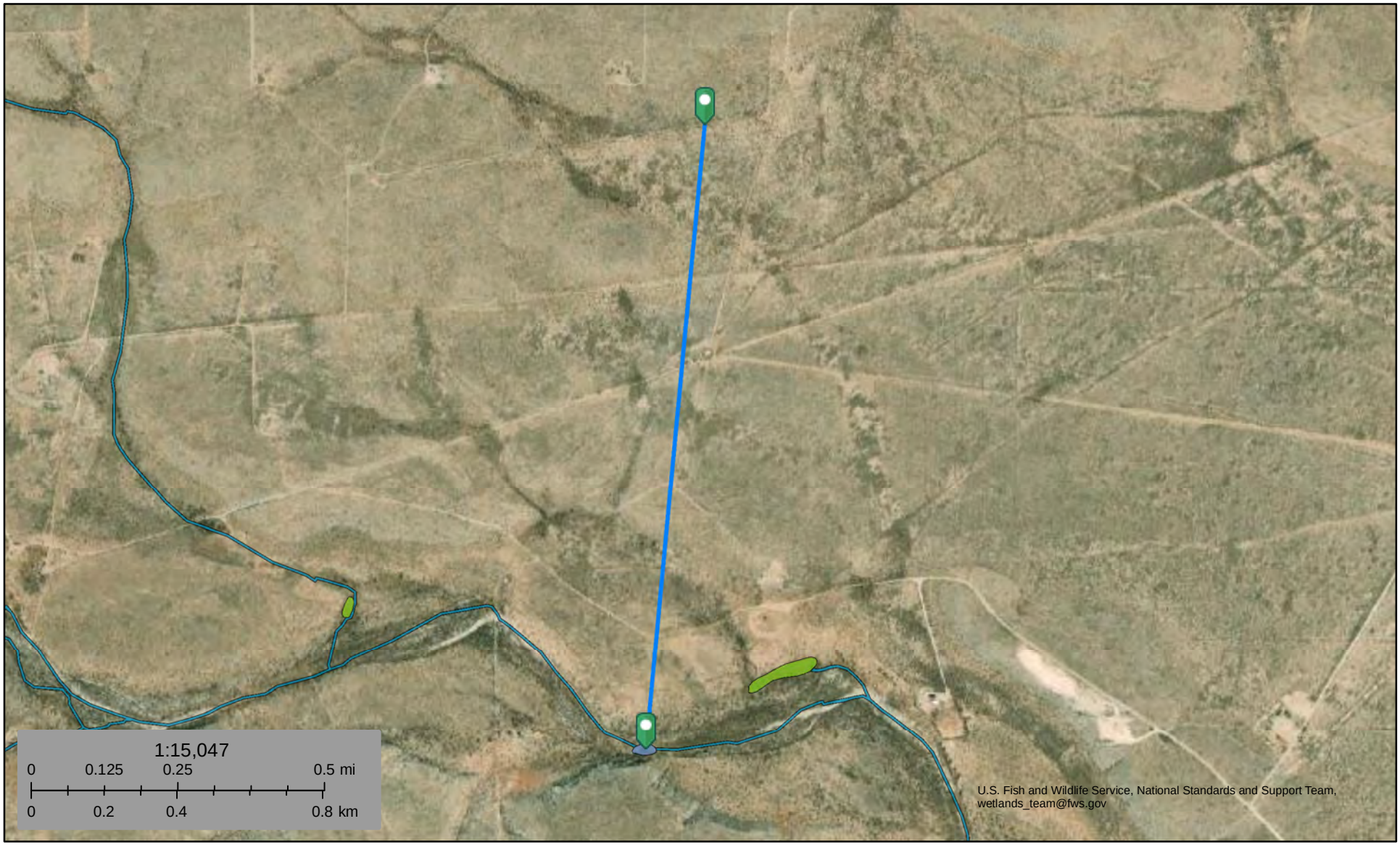
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Irish Hills pond 4,733 ft.



January 31, 2023

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Irish Hills

Nearest Residence:
9,412 ft.

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum)

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 6416 4	Sec	Tws	Rng	X	Y	Distance
RA 13243	RA	EXP	0	EOG RESOURCES INC	ED	RA 13243 POD 1	NA				4 3 3	06	19S	25E	544060	3616318	668
RA 05286	RA	PRO	3	EOG Y RESOURCES INC	ED	RA 05286 (2A)				Shallow		06	19S	25E	544587	3617042*	819
RA 03959	RA	STK	3	JAMES H AND BETTY R HOWELL REVOCABLE TRUST	ED	RA 03959					2 4	12	19S	24E	543589	3615225*	1518
RA 13183	RA	MON	0	HARRISON & COOPER INC	ED	RA 13183 POD1	NA				4 4 2	06	19S	25E	545284	3617757	1623
					ED	RA 13183 POD2					4 4 1	05	19S	25E	546179	3617084	1685
RA 05331	RA	PRO	3	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 05331				Shallow	1 1 4	05	19S	25E	546308	3616955*	1740
RA 13238	RA	EXP	0	EOG RESOURCES INC	ED	RA 13238 POD1	NA				2 3 2	01	19S	24E	543237	3617424	1904
RA 06436	RA	STK	43.5	JAMES H & BETTY R HOWELL REVOCABLE TRUST	ED	RA 06436				Shallow	3 1 4	12	19S	24E	543083	3615122*	1981
RA 06418	RA	STK	3	JAMES H. & BETTY R. HOWELL REVOCABLE TRUST	ED	RA 06418				Shallow	1 2 3	17	19S	25E	545925	3613710*	2795
RA 04426	RA	OBS	0	STATE ENGINEER OF NM	CH	RA 04426					4 3	18	19S	25E	544412	3613201*	3049
RA 08977	RA	DOL	3	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 08977					2 4 4	18	19S	25E	545298	3613190	3097
					ED	RA 08977 POD2					4 4 4	18	19S	25E	545298	3613190	3097
RA 11938	RA	PRO	0	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 08977					2 4 4	18	19S	25E	545298	3613190	3097
					ED	RA 08977 POD2					4 4 4	18	19S	25E	545298	3613190	3097
RA 11939	RA	PRO	0	YATES PETROLEUM CORPORATION	ED	RA 08977					2 4 4	18	19S	25E	545298	3613190	3097
					ED	RA 08977 POD2					4 4 4	18	19S	25E	545298	3613190	3097
RA 11940	RA	PRO	0	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 08977					2 4 4	18	19S	25E	545298	3613190	3097
					ED	RA 08977 POD2					4 4 4	18	19S	25E	545298	3613190	3097

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

(acre ft per annum)

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code Grant	Source	q 6416 4	Sec	Tws	Rng	X	Y	Distance
RA 13269	RA	MON	0	EOG RESOURCES INC	ED	RA 13269 POD1	NA			4 1 1	16	19S	25E	547275	3614401	3142
RA 04335	RA	STK	3	YATES RANCH PROPERTY LLP	CH	RA 04335			Shallow	1 1	32	18S	25E	545580	3619275*	3159
RA 13230	RA	EXP	0	RANGER ENVIRONMENTAL SERVICES	ED	RA 13230 POD 1	NA			4 2 2	14	19S	24E	542086	3614287	3277
RA 08148	RA	STK	3	YATES RANCH PROPERTY LLP	ED	RA 08148				3 3 1	36	18S	24E	542252	3618748*	3525
RA 05333	RA	PRO	3	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 05333			Shallow	2 2	09	19S	25E	548430	3616046*	3711
RA 09489	RA	PRO	0	YATES PETROLEUM	ED	RA 09489				2 2	09	19S	25E	548430	3616046*	3711
RA 11654	RA	STK	3	CATHY HOUGHTALING	ED	RA 11654 POD1				3 2	19	19S	25E	544959	3612514	3727
RA 11061	RA	STK	3	YATES RANCH PROPERTY LLP	ED	RA 11061 POD1				4 2	35	18S	24E	541949	3618852*	3814
RA 04726	RA	DOM	3	CATHY HOUGHTALING	ED	RA 04726			Shallow	3 2	19	19S	25E	544825	3612390*	3845
RA 05900	RA	STK	3	JAMES H AND BETTY R HOWELL REVOCABLE TRUST	ED	RA 05900			Shallow	2 2	16	19S	25E	548442	3614424*	4135
RA 13117	RA	MON	0	EOG RESOURCES INC	ED	RA 13117 POD1	NA		Shallow	3 4 1	24	19S	24E	542742	3612369	4342
					ED	RA 13117 POD2			Shallow	3 4 1	24	19S	24E	542729	3612364	4353
RA 03960	RA	STK	3	JAMES H. AND BETTY R. HOWELL REVOCABLE TRUST	ED	RA 03960				2 2	10	19S	24E	540341	3616025*	4387
RA 08146	RA	STK	3	YATES RANCH PROPERTY LLP	ED	RA 08146				4 4 3	28	18S	25E	547693	3619576*	4470
RA 12221	RA	EXP	0	RONALD DEAN HOUGHTALING	ED	RA 12221 POD1				2 4 4	19	19S	25E	545280	3611733	4534
					ED	RA 12221 POD2				2 4 4	19	19S	25E	545280	3611733	4534
					ED	RA 12221 POD3				2 4 4	19	19S	25E	545280	3611733	4534
					ED	RA 12221 POD4				2 4 4	19	19S	25E	545280	3611733	4534
					ED	RA 12221 POD5				2 4 4	19	19S	25E	545280	3611733	4534
RA 13122	RA	MON	0	WHITE DRILLING COMPANY INC	ED	RA 13122 POD1	NA			1 3 2	21	19S	25E	547935	3612424	4983

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

Record Count: 38

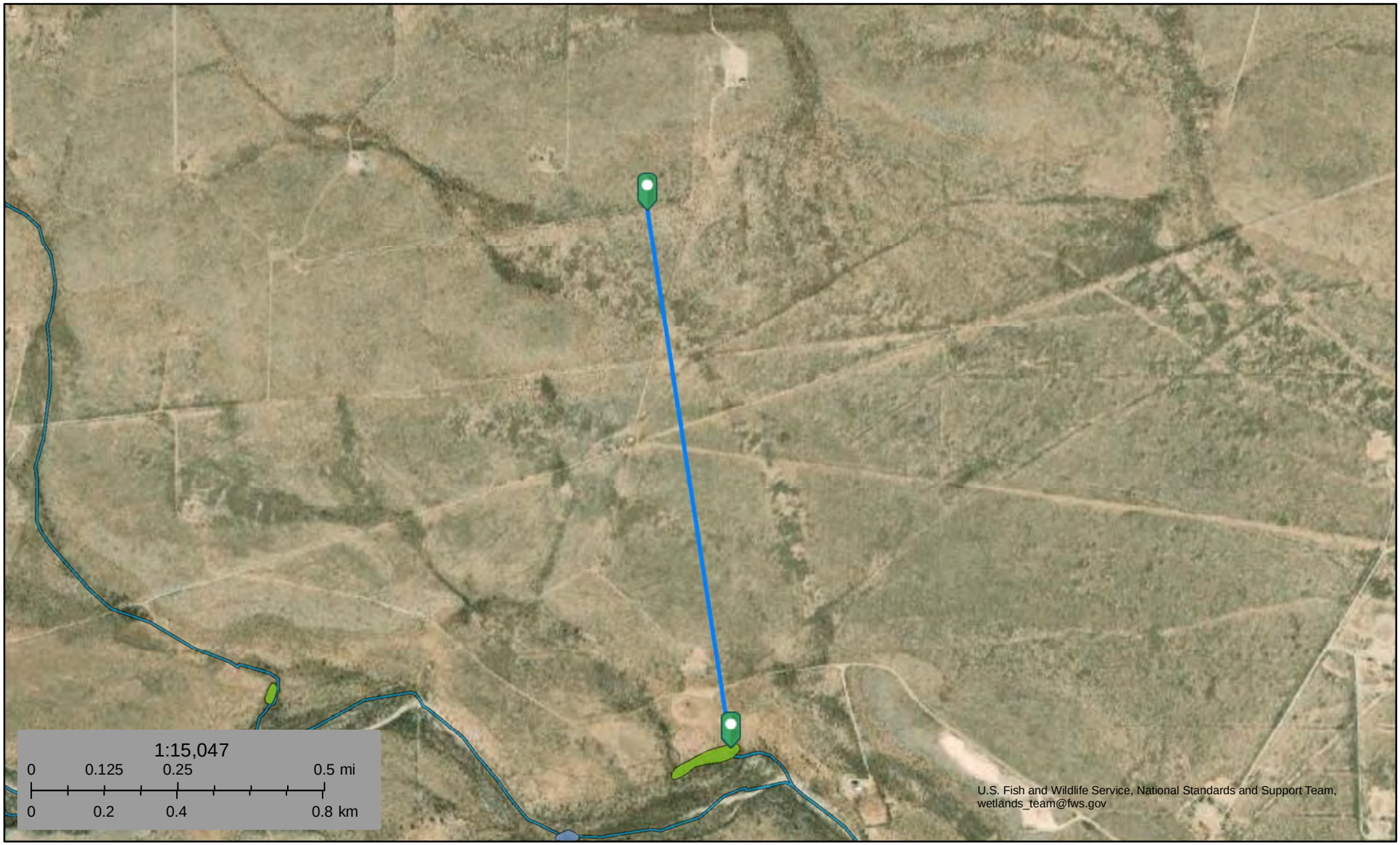
UTMNAD83 Radius Search (in meters):

Easting (X): 544723.35 **Northing (Y):** 3616234.31 **Radius:** 5000

Sorted by: Distance

U.S. Fish and Wildlife Service
National Wetlands Inventory

Irish Hills wetland 4,114 ft.



January 31, 2023

Wetlands

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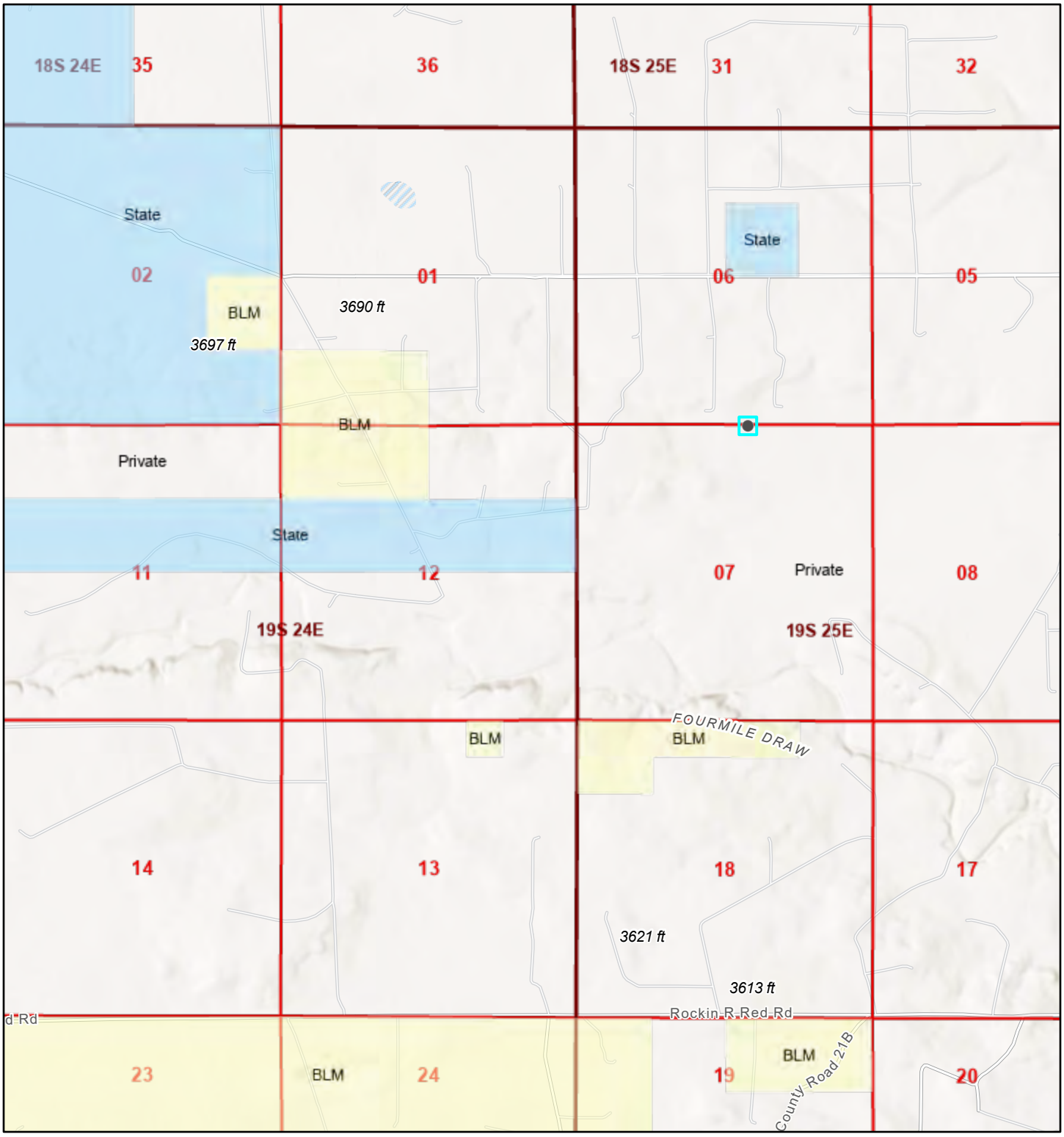
Active Mines in New Mexico



1/31/2023, 1:45:14 PM

1:36,112

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Land Ownership

S

BLM

PLSS First Division

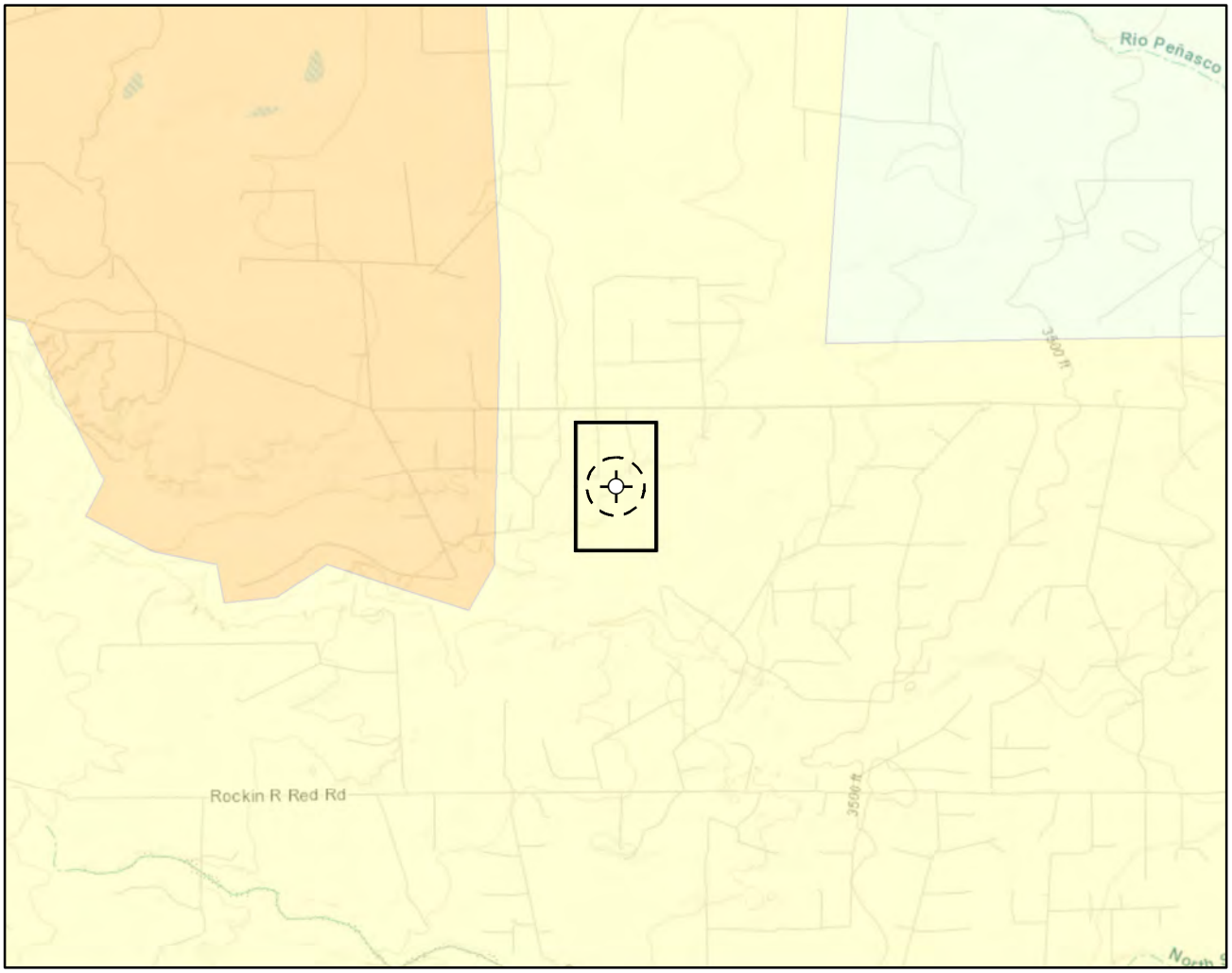
P

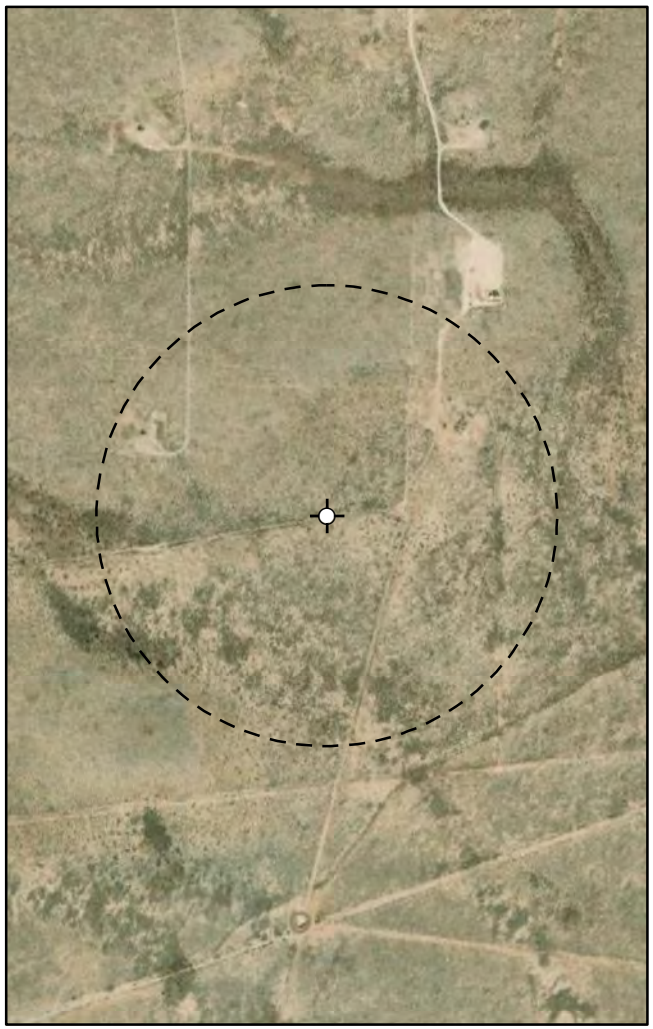
PLSS Townships

U.S. BLM, Esri, NASA, NGA, USGS, FEMA, BLM, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

EMNRD MMD GIS Coordinator

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





Karst Potential

- Critical
- High
- Medium
- Low

- Site 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: 32.682897, -104.522946

NAD 1983 UTM Zone 13N
Date: Feb 01/23

N

Karst Potential Map
Irish Hills Pipeline

FIGURE:
X

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: Inset Map, ESRI 2021; 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: \\vtx-s-fs01.corp.internal\shared\vps\04 - Geomatics\1-Projects_US PROJECTS\EOG Resources Inc\22E-00716 (Howell Ranch Reclamation Projects)\002 - Irish Hills Pipeline\Figure X Karst Potential (Irish Hills Pipeline).mxd

National Flood Hazard Layer FIRMette

FEMA

104°31'41"W 32°41'14"N

104°31'4"W 32°40'43"N

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

1:6,000

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 3/14/2023 at 8:24 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eddy Area, New Mexico

January 31, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

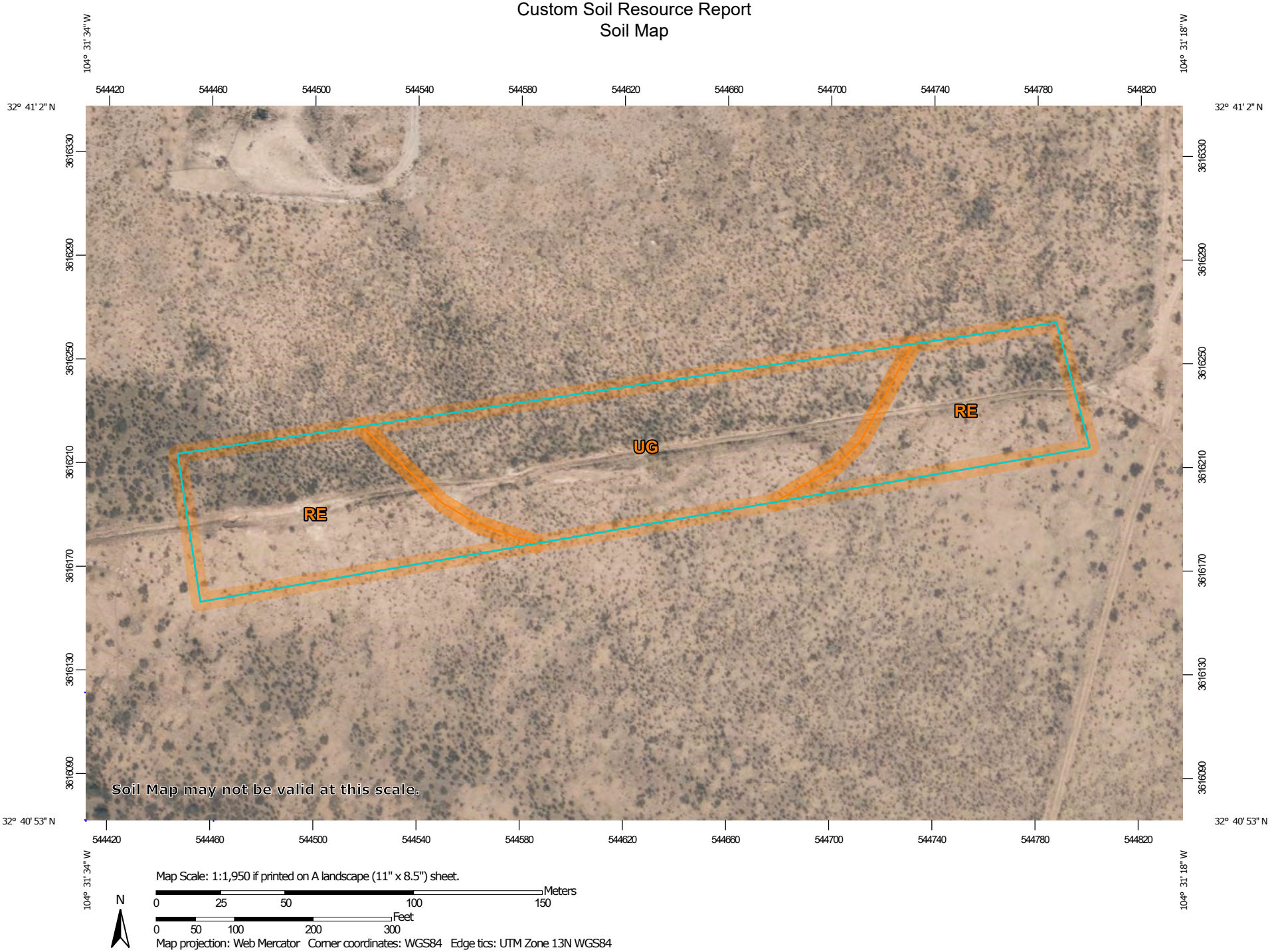
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,950 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

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 18, Sep 8, 2022

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
RE	Reagan-Upton association, 0 to 9 percent slopes	2.4	51.4%
UG	Upton gravelly loam, 0 to 9 percent slopes	2.2	48.6%
Totals for Area of Interest		**4.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eddy Area, New Mexico

RE—Reagan-Upton association, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1w5d
Elevation: 1,100 to 5,400 feet
Mean annual precipitation: 6 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 180 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Reagan and similar soils: 70 percent
Upton and similar soils: 25 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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: Very slightly saline to moderately saline (2.0 to 8.0 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: R042CY153NM - Loamy
Hydric soil rating: No

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: R042CY159NM - Shallow Loamy
Hydric soil rating: No

Minor Components

Atoka

Percent of map unit: 3 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Pima

Percent of map unit: 2 percent
Ecological site: R070BC017NM - Bottomland
Hydric soil rating: No

UG—Upton gravelly loam, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1w64
Elevation: 1,100 to 4,400 feet
Mean annual precipitation: 7 to 15 inches
Mean annual air temperature: 60 to 70 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Upton and similar soils: 96 percent
Minor components: 4 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: R070BC025NM - Shallow
Hydric soil rating: No

Minor Components

Reagan
Percent of map unit: 1 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Atoka
Percent of map unit: 1 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Atoka
Percent of map unit: 1 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Upton
Percent of map unit: 1 percent
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

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USDA Natural Resources Conservation Service

Ecological site R070BC025NM
Shallow

Accessed: 01/31/2023

General information

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

Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on knolls, ridges, hillslopes alluvial fans and escarpments. Slopes range fro 0 to 25 percent and average about 7 percent. Direction of slope varies and is usually not significant. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–25%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity – short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.

The average frost-free season is 180 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.

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

Table 3. Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	240 days
Precipitation total (average)	13 in

Influencing water features

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

Soil features

The soils of this site are shallow to very shallow. Soils are derived from mixed calcareous eolian deposits derived from sedimentary rock. Surface layers are very cobbly loam, very gravelly loam, gravelly loam, cobbly loam, gravelly fine sandy loam or gravelly sandy loam.

There is an indurated caliche layer or limestone bedrock that occurs within 20 inches and averages less than 10 inches. Limestone or caliche layer may be the restrictive layer.

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

Characteristic soils:

Lozier
Potter
Tencee
Upton
Ector
Kimbrough

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Extremely gravelly loam (3) Extremely cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Soil depth	4–20 in
Surface fragment cover <=3"	15–40%
Available water capacity (0-40in)	1 in
Calcium carbonate equivalent (0-40in)	15–60%

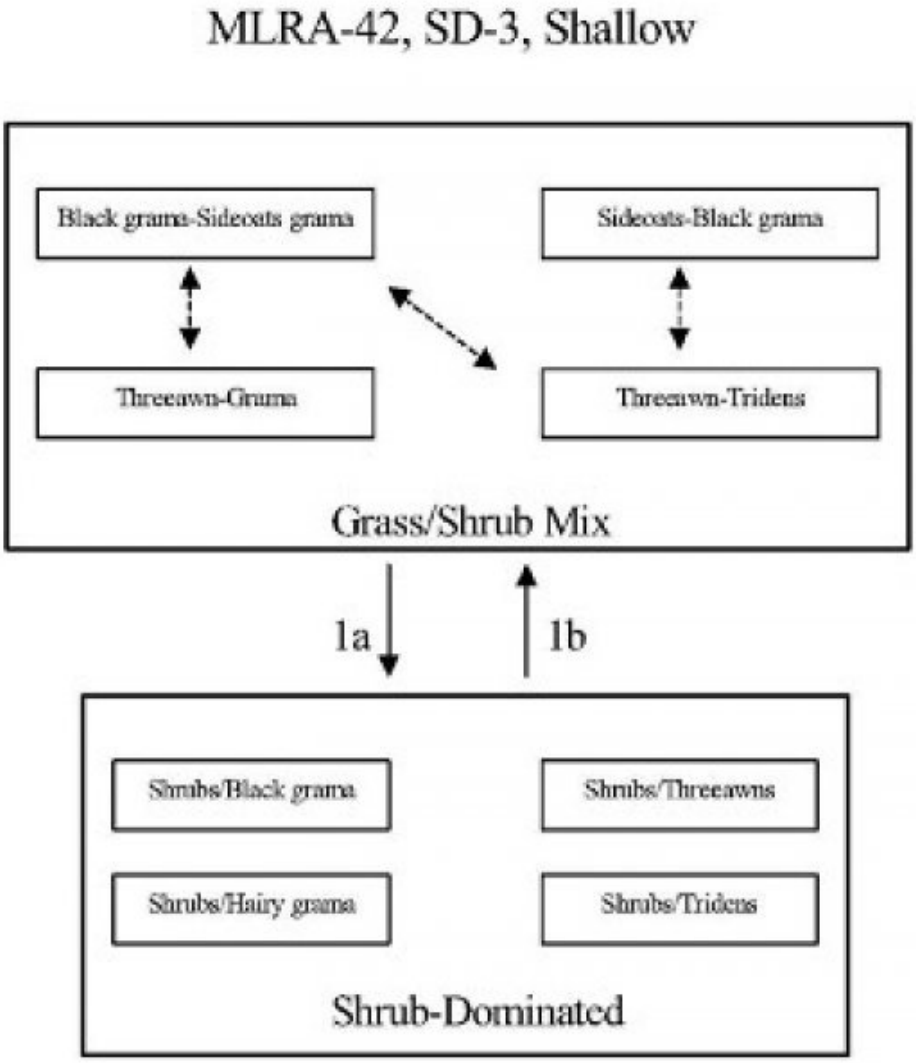
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	13–42%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

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. 1

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Extended drought, overgrazing, no fire

1b. Brush control, Prescribed grazing

State 1
Grass/Shrub Mix

Community 1.1
Grass/Shrub Mix

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.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	168	352	536
Shrub/Vine	63	131	200
Forb	20	42	64
Total	**251**	**525**	**800**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-8%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-60%

Figure 5. Plant community growth curve (percent production by month). NM2825, R042XC025NM Shallow HCPC. R042XC025NM Shallow HCPC Warm Season Plant Community.

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

State 2
Shrub-Dominated

Community 2.1
Shrub-Dominated

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 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, periodic use of prescribed fire may assist in maintaining the Grassland/Shrub state.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				105–158	
	black grama	BOER4	*Bouteloua eriopoda*	105–158	–
2				79–105	
	sideoats grama	BOCU	*Bouteloua curtipendula*	79–105	–
3				79–105	
	blue grama	BOGR2	*Bouteloua gracilis*	79–105	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	79–105	–
4				26–53	
	bush muhly	MUPO2	*Muhlenbergia porteri*	26–53	–
5				16–26	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	16–26	–
6				26–53	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	26–53	–
7				16–26	
	hairy woollygrass	ERPI5	*Erioneuron pilosum*	16–26	–
8				5–16	
	ear muhly	MUAR	*Muhlenbergia arenacea*	5–16	–
9				5–16	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	5–16	–
10				5–16	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	5–16	–
11				16–26	
	Grass, perennial	2GP	*Grass, perennial*	16–26	–
Forb					
12				11–26	
	stemless four-nerve daisy	TEACE	*Tetraneuris acaulis var. epunctata*	11–26	–
13				5–16	
	woolly groundsel	PACA15	*Packera cana*	5–16	–
14				5–16	

14				5–16	
	globemallow	SPHAE	*Sphaeralcea*	5–16	–
15				5–16	
	bladderpod	LESQU	*Lesquerella*	5–16	–
16				5–16	
	cassia	CASSI	*Cassia*	5–16	–
17				11–26	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	11–26	–
Shrub/Vine					
18				5–16	
	littleleaf sumac	RHMI3	*Rhus microphylla*	5–16	–
19				5–16	
	creosote bush	LATR2	*Larrea tridentata*	5–16	–
20				5–16	
	littleleaf ratany	KRER	*Krameria erecta*	5–16	–
21				5–16	
	javelina bush	COER5	*Condalia ericoides*	5–16	–
22				5–16	
	American tarwort	FLCE	*Flourensia cernua*	5–16	–
23				5–16	
	crown of thorns	KOSP	*Koeberlinia spinosa*	5–16	–
24				11–26	
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
25				5–16	
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	5–16	–
26				5–16	
	pricklypear	OPUNT	*Opuntia*	5–16	–
27				11–26	
	mariola	PAIN2	*Parthenium incanum*	11–26	–
	mariola	PAIN2	*Parthenium incanum*	11–26	–
28				5–16	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	5–16	–
29				16–26	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	16–26	–

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, 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.

Hydrological functions

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

Hydrologic Interpretations
Soil Series-------- Hydrologic Group
Lozier---------- D
Potter---------- C
Tencee---------- D
Upton---------- C
Kimbrough---------- D
Upton---------- D
Ector---------- 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, catclaw, 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 +

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico (SD-3). This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Other references

Literature Cited:

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

Contributors

David Trujillo
Don Sylvester

Rangeland health reference sheet

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

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

Indicators

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

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

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

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

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

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

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

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

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

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

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

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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

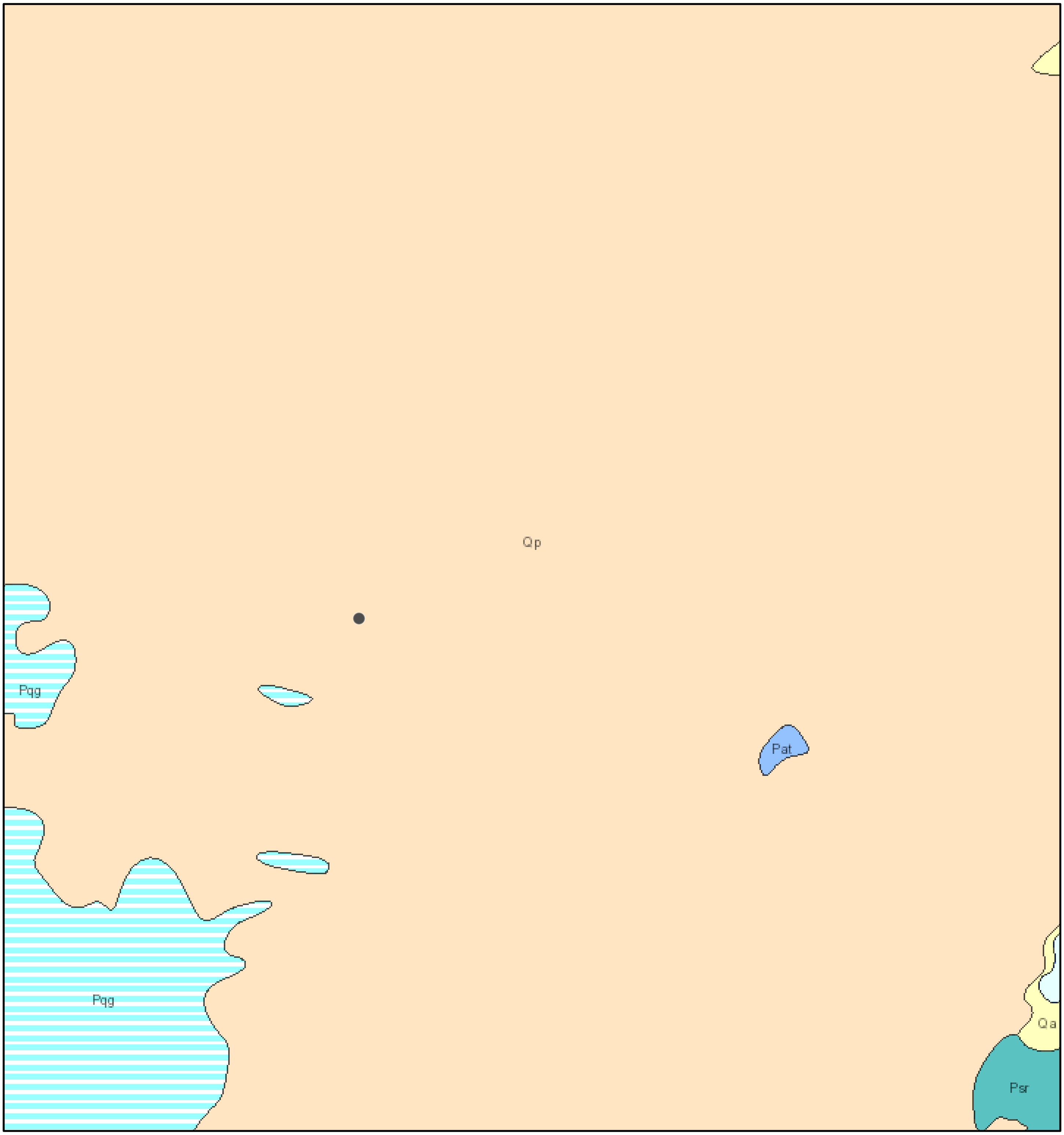
14. **Average percent litter cover (%) and depth (in):**

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

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

17. **Perennial plant reproductive capability:**

ArcGIS Web Map



1/31/2023, 2:30:54 PM

1:144,448

0 1 2 4 mi
0 1.5 3 6 km

Lithologic Units

Playa——Alluvium and evaporite deposits (Holocene)

Water——Perenial standing water

Qa——Alluvium (Holocene to upper Pleistocene)

Esri, NASA, NGA, USGS, USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data;

ArcGIS Web AppBuilder

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

ATTACHMENT 5

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	3/27/2023
Site Location Name:	Irish Hills - Area 2	Report Run Date:	4/12/2023 5:03 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	3/27/2023 8:30 AM
Departed Site	3/27/2023 3:00 PM

Field Notes

14:51 Arrived on site and filled out safety paperwork.

14:51 Continued excavation.

8:37 Collected samples and field screened them.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: East	**Viewing Direction**: North
	
Excavation	Excavation
Viewing Direction: West	**Viewing Direction**: South
	
Excavation	Excavation

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Hunter Klein

Signature: 

Daily Site Visit Report

Client:	EOG Resources Inc.	Inspection Date:	4/3/2023
Site Location Name:	Irish Hills - Area 2	Report Run Date:	4/3/2023 8:08 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	4/3/2023 11:02 AM
Departed Site	4/3/2023 11:30 AM

Field Notes

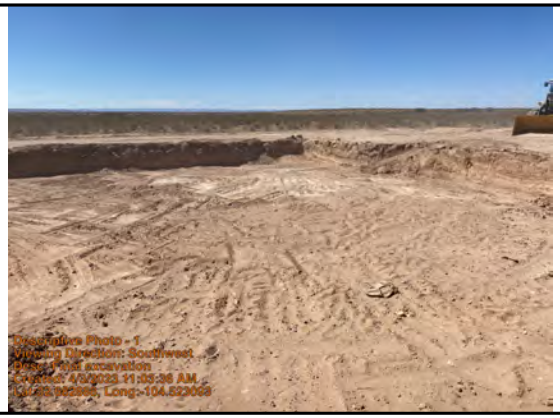
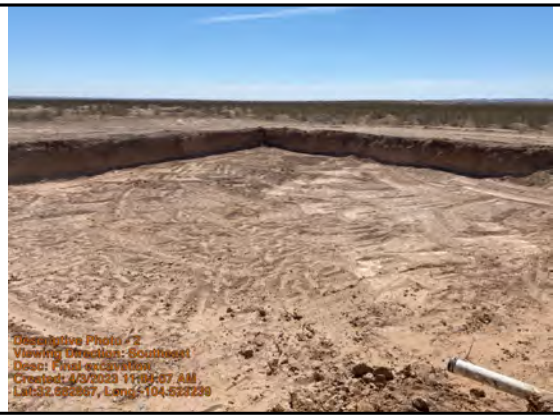
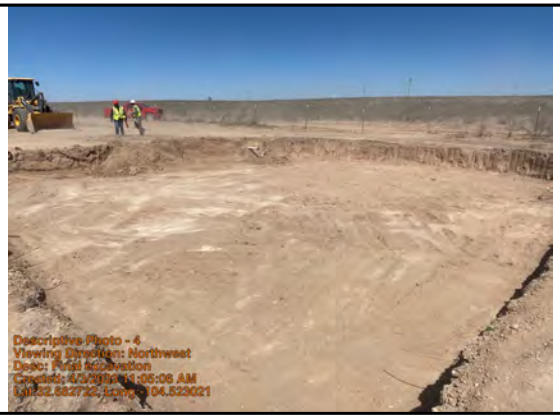
11:02 On site to take final photos of the excavation

Next Steps & Recommendations

1 Include DFR in closure report

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest	**Viewing Direction**: Southeast
	
Final excavation	Final excavation
Viewing Direction: Northeast	**Viewing Direction**: Northwest
	
Final excavation	Final excavation

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Chance Dixon

Signature: 

Signature

ATTACHMENT 6

From: Tina Huerta
To: ocd.enviro@emnrd.nm.gov; Alan & Cheryl ; Austin Weyant
Cc: Andrea Felix; Katie Jamison; Michael Yemm; Terrence Gant
Subject: Irish Hills Pipeline - Area 2 (nAPP2307639252) Sampling Notification
Date: March 23, 2023 8:19:49 AM
Attachments: image001.png

Good morning,

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

Irish Hills Pipeline – Area 2
D-7-19S-25E
Eddy County, NM
nAPP2307639252

Sampling will begin at 8:30 a.m. on Monday, March 27, 2023, and continue through Saturday, April 1, 2023.

Sorry, this is late.

Thank you,

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

Artesia Division

From: Tina Huerta
To: ocd.enviro@emnrd.nm.gov; Alan & Cheryl ; Austin Weyant
Cc: Andrea Felix; Katie Jamison; Michael Yemm; Terrence Gant
Subject: Irish Hills Pipeline - Area 2 (nAPP2307639252) Sampling Notification
Date: March 30, 2023 8:02:49 AM
Attachments: image001.png

Good morning,

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

Irish Hills Pipeline – Area 2
D-7-19S-25E
Eddy County, NM
nAPP2307639252

Sampling will begin at 8:30 a.m. on Monday, April 3, 2023, and continue through Saturday, April 8, 2023.

Thank you,

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

Artesia Division

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 18, 2022

Monica Peppin

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

RE: Irish Hills Pipeline OrderNo.: 2208417

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 29 sample(s) on 8/6/2022 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-01 2'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 2:20:00 PM
Lab ID: 2208417-001 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/9/2022 8:59:44 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/9/2022 8:59:44 PM
Surr: DNOP	40.6	21-129		%Rec	1	8/9/2022 8:59:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/10/2022 6:11:39 PM
Surr: BFB	109	37.7-212		%Rec	1	8/10/2022 6:11:39 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 6:11:39 PM
Toluene	ND	0.050		mg/Kg	1	8/10/2022 6:11:39 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/10/2022 6:11:39 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 6:11:39 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/10/2022 6:11:39 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	63	60		mg/Kg	20	8/12/2022 2:31:11 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-01 4'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 2:25:00 PM
Lab ID: 2208417-002 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/9/2022 9:24:01 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/9/2022 9:24:01 PM
Surr: DNOP	45.5	21-129		%Rec	1	8/9/2022 9:24:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 6:35:21 PM
Surr: BFB	110	37.7-212		%Rec	1	8/10/2022 6:35:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 6:35:21 PM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 6:35:21 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 6:35:21 PM
Xylenes, Total	ND	0.097		mg/Kg	1	8/10/2022 6:35:21 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/10/2022 6:35:21 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	1100	60		mg/Kg	20	8/12/2022 2:43:36 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-03 2'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 12:05:00 PM
Lab ID: 2208417-003 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/9/2022 9:48:34 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/9/2022 9:48:34 PM
Surr: DNOP	42.1	21-129		%Rec	1	8/9/2022 9:48:34 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/10/2022 6:59:02 PM
Surr: BFB	109	37.7-212		%Rec	1	8/10/2022 6:59:02 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 6:59:02 PM
Toluene	ND	0.050		mg/Kg	1	8/10/2022 6:59:02 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/10/2022 6:59:02 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 6:59:02 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/10/2022 6:59:02 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	59		mg/Kg	20	8/12/2022 2:56:01 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-03 4'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 12:05:00 PM
Lab ID: 2208417-004 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	14		mg/Kg	1	8/16/2022 3:15:03 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/16/2022 3:15:03 PM
Surr: DNOP	96.0	21-129		%Rec	1	8/16/2022 3:15:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 7:22:44 PM
Surr: BFB	110	37.7-212		%Rec	1	8/10/2022 7:22:44 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 7:22:44 PM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 7:22:44 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 7:22:44 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/10/2022 7:22:44 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/10/2022 7:22:44 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	930	60		mg/Kg	20	8/12/2022 3:08:25 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-02 2'
Project: Irish Hills Pipeline
Collection Date: 8/3/2022 10:30:00 AM
Lab ID: 2208417-005 **Matrix:** SOIL
Received Date: 8/6/2022 10:30:00 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	8/11/2022 12:28:47 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/11/2022 12:28:47 AM
Surr: DNOP	79.1	21-129		%Rec	1	8/11/2022 12:28:47 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 5:37:00 PM
Surr: BFB	89.6	37.7-212		%Rec	1	8/10/2022 5:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 5:37:00 PM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 5:37:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 5:37:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 5:37:00 PM
Surr: 4-Bromofluorobenzene	80.6	70-130		%Rec	1	8/10/2022 5:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	240	60		mg/Kg	20	8/12/2022 3:20:49 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-02 4'
Project: Irish Hills Pipeline
Collection Date: 8/3/2022 10:35:00 AM
Lab ID: 2208417-006 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/11/2022 1:15:53 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/11/2022 1:15:53 AM
Surr: DNOP	85.1	21-129		%Rec	1	8/11/2022 1:15:53 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/10/2022 6:37:00 PM
Surr: BFB	86.5	37.7-212		%Rec	1	8/10/2022 6:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 6:37:00 PM
Toluene	ND	0.047		mg/Kg	1	8/10/2022 6:37:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	8/10/2022 6:37:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	8/10/2022 6:37:00 PM
Surr: 4-Bromofluorobenzene	76.7	70-130		%Rec	1	8/10/2022 6:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	760	60		mg/Kg	20	8/12/2022 3:33:13 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-04 2'
Project: Irish Hills Pipeline
Collection Date: 8/3/2022 8:25:00 AM
Lab ID: 2208417-007 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/11/2022 1:31:32 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/11/2022 1:31:32 AM
Surr: DNOP	74.9	21-129		%Rec	1	8/11/2022 1:31:32 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 7:36:00 PM
Surr: BFB	89.5	37.7-212		%Rec	1	8/10/2022 7:36:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 7:36:00 PM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 7:36:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 7:36:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 7:36:00 PM
Surr: 4-Bromofluorobenzene	81.1	70-130		%Rec	1	8/10/2022 7:36:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/12/2022 4:35:15 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 **2208417**
Date Reported: **8/18/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-04 4'
Project: Irish Hills Pipeline
Collection Date: 8/3/2022 8:30:00 AM
Lab ID: 2208417-008 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/11/2022 1:47:15 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/11/2022 1:47:15 AM
Surr: DNOP	79.8	21-129		%Rec	1	8/11/2022 1:47:15 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/10/2022 7:56:00 PM
Surr: BFB	93.7	37.7-212		%Rec	1	8/10/2022 7:56:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 7:56:00 PM
Toluene	ND	0.050		mg/Kg	1	8/10/2022 7:56:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/10/2022 7:56:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 7:56:00 PM
Surr: 4-Bromofluorobenzene	83.4	70-130		%Rec	1	8/10/2022 7:56:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/12/2022 5:12:28 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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **MB-69458** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69458** RunNo: **90258**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219131** Units: **mg/Kg**

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

Sample ID: **LCS-69458** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69458** RunNo: **90258**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219132** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.3	90	110			

Sample ID: **MB-69462** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69462** RunNo: **90258**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219133** Units: **mg/Kg**

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

Sample ID: **LCS-69462** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69462** RunNo: **90258**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219134** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.3	90	110			

Sample ID: **MB-69461** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69461** RunNo: **90236**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219286** Units: **mg/Kg**

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

Sample ID: **LCS-69461** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69461** RunNo: **90236**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3219287** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical 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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **LCS-69340** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212922** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	15	50.00	0	89.3	64.4	127			
Surr: DNOP	4.6		5.000		91.3	21	129			

Sample ID: **LCS-69347** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69347** RunNo: **90104**
Prep Date: **8/9/2022** Analysis Date: **8/9/2022** SeqNo: **3212923** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	15	50.00	0	90.5	64.4	127			
Surr: DNOP	4.5		5.000		89.6	21	129			

Sample ID: **MB-69340** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212924** 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	9.8		10.00		98.4	21	129			

Sample ID: **MB-69347** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69347** RunNo: **90104**
Prep Date: **8/9/2022** Analysis Date: **8/9/2022** SeqNo: **3212925** 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	9.7		10.00		96.8	21	129			

Sample ID: **MB-69345** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69345** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/10/2022** SeqNo: **3216107** 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		83.6	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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **LCS-69345** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69345** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/11/2022** SeqNo: **3216108** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	82	15	50.00	0	163	64.4	127			S
Surr: DNOP	5.7		5.000		113	21	129			

Sample ID: **2208417-005AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-02 2'** Batch ID: **69345** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/11/2022** SeqNo: **3216110** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	60	14	46.17	0	131	36.1	154			
Surr: DNOP	4.1		4.617		89.2	21	129			

Sample ID: **2208417-005AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-02 2'** Batch ID: **69345** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/11/2022** SeqNo: **3216111** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	65	14	46.69	0	140	36.1	154	7.71	33.9	
Surr: DNOP	4.4		4.669		94.7	21	129	0	0	

Sample ID: **LCS-69404** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69404** RunNo: **90218**
Prep Date: **8/10/2022** Analysis Date: **8/11/2022** SeqNo: **3217777** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	15	50.00	0	86.6	64.4	127			
Surr: DNOP	4.5		5.000		89.7	21	129			

Sample ID: **MB-69404** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69404** RunNo: **90218**
Prep Date: **8/10/2022** Analysis Date: **8/11/2022** SeqNo: **3217781** 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	9.3		10.00		93.4	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#: **2208417**

18-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **MB-69457** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **69457** RunNo: **90218**

Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3218061** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.7		10.00		97.3	21	129			

Sample ID: **LCS-69457** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **69457** RunNo: **90218**

Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3218062** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.7		5.000		94.3	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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **LCS-69333** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **69333** RunNo: **90135**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3213405** 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	101	72.3	137			
Surr: BFB	2000		1000		202	37.7	212			

Sample ID: **mb-69333** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **69333** RunNo: **90135**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3213406** 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	1000		1000		101	37.7	212			

Sample ID: **lcs-69357** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **69357** RunNo: **90135**
Prep Date: **8/9/2022** Analysis Date: **8/10/2022** SeqNo: **3214169** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	109	72.3	137			
Surr: BFB	2100		1000		210	37.7	212			

Sample ID: **mb-69357** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **69357** RunNo: **90135**
Prep Date: **8/9/2022** Analysis Date: **8/10/2022** SeqNo: **3214170** 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	1000		1000		104	37.7	212			

Sample ID: **lcs-69334** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214880** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.2	72.3	137			
Surr: BFB	1800		1000		185	37.7	212			

Sample ID: **mb-69334** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214881** Units: **mg/Kg**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208417**

18-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **mb-69334** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **69334** RunNo: **90150**

Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214881** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	870		1000		87.0	37.7	212			

Sample ID: **2208417-005ams** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **BH22-02 2'** Batch ID: **69334** RunNo: **90150**

Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214883** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	4.9	24.68	0	107	70	130			
Surr: BFB	1900		987.2		193	37.7	212			

Sample ID: **2208417-005amsd** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **BH22-02 2'** Batch ID: **69334** RunNo: **90150**

Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214884** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	4.9	24.61	0	113	70	130	4.43	20	
Surr: BFB	2000		984.3		201	37.7	212	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **lcs-69333**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69333**	RunNo: **90135**
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213423** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	90.9	80	120			
Toluene	0.94	0.050	1.000	0	94.1	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.5	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	70	130			

Sample ID: **mb-69333**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69333**	RunNo: **90135**
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213424** 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	0.99		1.000		99.0	70	130			

Sample ID: **LCS-69357**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69357**	RunNo: **90135**
Prep Date: **8/9/2022**	Analysis Date: **8/10/2022**	SeqNo: **3214183** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.0	80	120			
Toluene	0.97	0.050	1.000	0	96.8	80	120			
Ethylbenzene	0.97	0.050	1.000	0	97.0	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.5	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	70	130			

Sample ID: **mb-69357**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69357**	RunNo: **90135**
Prep Date: **8/9/2022**	Analysis Date: **8/10/2022**	SeqNo: **3214184** 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	1.0		1.000		101	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208417**
18-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **lcs-69334** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214906** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.025	1.000	0	84.9	80	120			
Toluene	0.86	0.050	1.000	0	86.5	80	120			
Ethylbenzene	0.86	0.050	1.000	0	85.7	80	120			
Xylenes, Total	2.5	0.10	3.000	0	84.8	80	120			
Surr: 4-Bromofluorobenzene	0.79		1.000		78.9	70	130			

Sample ID: **mb-69334** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214907** 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	0.78		1.000		78.5	70	130			

Sample ID: **2208417-006ams** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-02 4'** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214910** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.024	0.9506	0	89.8	68.8	120			
Toluene	0.87	0.048	0.9506	0	92.0	73.6	124			
Ethylbenzene	0.88	0.048	0.9506	0	93.1	72.7	129			
Xylenes, Total	2.6	0.095	2.852	0	92.2	75.7	126			
Surr: 4-Bromofluorobenzene	0.78		0.9506		82.3	70	130			

Sample ID: **2208417-006amsd** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-02 4'** Batch ID: **69334** RunNo: **90150**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3214911** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.024	0.9488	0	87.7	68.8	120	2.49	20	
Toluene	0.86	0.047	0.9488	0	90.1	73.6	124	2.26	20	
Ethylbenzene	0.86	0.047	0.9488	0	90.4	72.7	129	3.12	20	
Xylenes, Total	2.6	0.095	2.846	0	89.7	75.7	126	2.93	20	
Surr: 4-Bromofluorobenzene	0.75		0.9488		78.6	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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: 2208417

RcptNo: 1

Received By: Tracy Casarrubias 8/6/2022 10:30:00 AM

Completed By: Tracy Casarrubias 8/6/2022 12:34:13 PM

Reviewed By: SR 8/8/22

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: JN 8/8/22

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	3.7	Good	Yes			
2	4.5	Good	Yes			

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Client: Vertex (EOG, Chase Settle)

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: ☒ Standard ☒ Rush 5 Day

Project Name: Irish Hills Pipeline

Project #: 22G-00716-02

Project Manager: Monica Peppin

Sampler: L. Pullman

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp (including CF): 3.5 +0.2 = 3.7 (°C); 4.3 +0.2 = 4.5 °C

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2208417	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)
8-2-22	14:20	Soil	BH22-01 2'	1 Jar		001	X	X					X			
8-2-22	14:25	Soil	BH22-01 4'	1 Jar		002	X	X					X			
8-2-22	12:05	Soil	BH22-03 2'	1 Jar		003	X	X					X			
8-2-22	12:05	Soil	BH22-03 4'	1 Jar		004	X	X					X			
8-3-22	10:30	Soil	BH22-02 2'	↓		005	↓	↓					↓			
8-3-22	10:35	Soil	BH22-02 4'	↓		006	↓	↓					↓			
8-3-22	08:25	Soil	BH22-04 2'	↓		007	↓	↓					↓			
8-3-22	08:30	Soil	BH22-04 4'	↓		008	↓	↓					↓			
8-3-22	13:30	↓	BH22-05 0'	↓		009	↓	↓					↓			
8-3-22	13:35	↓	BH22-06 0'	↓		010	↓	↓					↓			
8-3-22	13:40	↓	BH22-07 0'	↓		011	↓	↓					↓			
8-3-22	13:50	↓	BH22-07 2'	↓		012	↓	↓					↓			

Date	Time	Relinquished by	Received by	Via	Date	Time
8-5-22	08:30	Jaben Pullman	[signature]		8/5/22	1130
8/5/22	1900	[signature]	[signature]	courier	8/6/22	10:30

Remarks: Direct bill to EOG, Chase Settle. cc: M. Peppin for final Report

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

August 15, 2022

Monica Peppin

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

RE: Irish Hills Pipeline OrderNo.: 2208251

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 18 sample(s) on 8/4/2022 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 **2208251**
Date Reported: **8/15/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-01 0'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 9:30:00 AM
Lab ID: 2208251-001 **Matrix:** SOIL **Received Date:** 8/4/2022 7:04:00 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	8/8/2022 6:17:08 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/8/2022 6:17:08 PM
Surr: DNOP	46.0	21-129		%Rec	1	8/8/2022 6:17:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/6/2022 3:35:29 PM
Surr: BFB	104	37.7-212		%Rec	1	8/6/2022 3:35:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/6/2022 3:35:29 PM
Toluene	ND	0.049		mg/Kg	1	8/6/2022 3:35:29 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/6/2022 3:35:29 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/6/2022 3:35:29 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	8/6/2022 3:35:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/8/2022 11:39:26 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 **2208251**
Date Reported: **8/15/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-02 0'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 9:05:00 AM
Lab ID: 2208251-005 **Matrix:** SOIL **Received Date:** 8/4/2022 7:04:00 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	8/8/2022 6:31:13 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/8/2022 6:31:13 PM
Surr: DNOP	48.6	21-129		%Rec	1	8/8/2022 6:31:13 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/6/2022 4:46:14 PM
Surr: BFB	101	37.7-212		%Rec	1	8/6/2022 4:46:14 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.023		mg/Kg	1	8/6/2022 4:46:14 PM
Toluene	ND	0.047		mg/Kg	1	8/6/2022 4:46:14 PM
Ethylbenzene	ND	0.047		mg/Kg	1	8/6/2022 4:46:14 PM
Xylenes, Total	ND	0.094		mg/Kg	1	8/6/2022 4:46:14 PM
Surr: 4-Bromofluorobenzene	97.8	70-130		%Rec	1	8/6/2022 4:46:14 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/9/2022 12:41:10 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 **2208251**
Date Reported: **8/15/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH22-03 0'
Project: Irish Hills Pipeline **Collection Date:** 8/2/2022 9:15:00 AM
Lab ID: 2208251-006 **Matrix:** SOIL **Received Date:** 8/4/2022 7:04:00 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	8/8/2022 6:45:22 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/8/2022 6:45:22 PM
Surr: DNOP	68.2	21-129		%Rec	1	8/8/2022 6:45:22 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/6/2022 5:09:50 PM
Surr: BFB	102	37.7-212		%Rec	1	8/6/2022 5:09:50 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.023		mg/Kg	1	8/6/2022 5:09:50 PM
Toluene	ND	0.047		mg/Kg	1	8/6/2022 5:09:50 PM
Ethylbenzene	ND	0.047		mg/Kg	1	8/6/2022 5:09:50 PM
Xylenes, Total	ND	0.094		mg/Kg	1	8/6/2022 5:09:50 PM
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	8/6/2022 5:09:50 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	61		mg/Kg	20	8/9/2022 12:53:31 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 **2208251**
Date Reported: **8/15/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-04 0'
Project: Irish Hills Pipeline
Collection Date: 8/2/2022 9:10:00 AM
Lab ID: 2208251-009 **Matrix:** SOIL **Received Date:** 8/4/2022 7:04:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	13		mg/Kg	1	8/8/2022 6:59:31 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	8/8/2022 6:59:31 PM
Surr: DNOP	67.8	21-129		%Rec	1	8/8/2022 6:59:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/6/2022 5:33:31 PM
Surr: BFB	102	37.7-212		%Rec	1	8/6/2022 5:33:31 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/6/2022 5:33:31 PM
Toluene	ND	0.048		mg/Kg	1	8/6/2022 5:33:31 PM
Ethylbenzene	ND	0.048		mg/Kg	1	8/6/2022 5:33:31 PM
Xylenes, Total	ND	0.096		mg/Kg	1	8/6/2022 5:33:31 PM
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	8/6/2022 5:33:31 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/9/2022 1:05:53 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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **MB-69336**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **69336**	RunNo: **90106**
Prep Date: **8/8/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212323** Units: **mg/Kg**

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

Sample ID: **LCS-69336**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **69336**	RunNo: **90106**
Prep Date: **8/8/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212324** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	98.7	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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **MB-69285**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **69285**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212781** 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	9.4		10.00		94.1	21	129			

Sample ID: **LCS-69285**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **69285**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212782** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	15	50.00	0	82.2	64.4	127			
Surr: DNOP	4.7		5.000		93.1	21	129			

Sample ID: **MB-69298**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **69298**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212806** 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	6.0		10.00		60.4	21	129			

Sample ID: **LCS-69298**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **69298**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212807** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	36	15	50.00	0	72.9	64.4	127			
Surr: DNOP	3.0		5.000		59.4	21	129			

Sample ID: **2208251-015AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **SS22-06 0'**	Batch ID: **69298**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212809** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	37	14	47.76	0	78.1	36.1	154			
Surr: DNOP	1.6		4.776		32.9	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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **2208251-015AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **SS22-06 0'**	Batch ID: **69298**	RunNo: **90121**
Prep Date: **8/5/2022**	Analysis Date: **8/8/2022**	SeqNo: **3212810** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	36	14	46.73	0	76.5	36.1	154	4.27	33.9	
Surr: DNOP	1.2		4.673		26.2	21	129	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **lcs-69272**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210124** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	107	72.3	137			
Surr: BFB	2000		1000		203	37.7	212			

Sample ID: **mb-69272**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210125** 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	950		1000		95.0	37.7	212			

Sample ID: **2208251-015ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SS22-06 0'**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210127** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	4.9	24.65	0	117	70	130			
Surr: BFB	2100		986.2		217	37.7	212			S

Sample ID: **2208251-015amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SS22-06 0'**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210128** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	4.9	24.61	0	112	70	130	5.20	20	
Surr: BFB	2100		984.3		212	37.7	212	0	0	

Sample ID: **lcs-69269**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **69269**	RunNo: **90070**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210415** 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	101	72.3	137			
Surr: BFB	2000		1000		200	37.7	212			

Sample ID: **mb-69269**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69269**	RunNo: **90070**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210417** Units: **mg/Kg**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **mb-69269**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69269**	RunNo: **90070**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210417** 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	1000		1000		103	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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **lcs-69272**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210177** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.025	1.000	0	89.5	80	120			
Toluene	0.90	0.050	1.000	0	89.9	80	120			
Ethylbenzene	0.90	0.050	1.000	0	89.8	80	120			
Xylenes, Total	2.7	0.10	3.000	0	88.6	80	120			
Surr: 4-Bromofluorobenzene	0.85		1.000		84.5	70	130			

Sample ID: **mb-69272**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210178** 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	0.86		1.000		86.3	70	130			

Sample ID: **2208251-016ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **SS22-07 0'**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210181** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.024	0.9579	0	95.9	68.8	120			
Toluene	0.94	0.048	0.9579	0	98.2	73.6	124			
Ethylbenzene	0.94	0.048	0.9579	0	98.6	72.7	129			
Xylenes, Total	2.8	0.096	2.874	0	97.8	75.7	126			
Surr: 4-Bromofluorobenzene	0.78		0.9579		81.4	70	130			

Sample ID: **2208251-016amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **SS22-07 0'**	Batch ID: **69272**	RunNo: **90068**
Prep Date: **8/4/2022**	Analysis Date: **8/6/2022**	SeqNo: **3210182** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.024	0.9625	0	91.2	68.8	120	4.57	20	
Toluene	0.89	0.048	0.9625	0	93.0	73.6	124	4.97	20	
Ethylbenzene	0.90	0.048	0.9625	0	93.6	72.7	129	4.79	20	
Xylenes, Total	2.7	0.096	2.887	0	92.6	75.7	126	5.01	20	
Surr: 4-Bromofluorobenzene	0.78		0.9625		81.1	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208251**

15-Aug-22

Client: Vertex Resources Services, Inc.

Project: Irish Hills Pipeline

Sample ID: **LCS-69269** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **69269** RunNo: **90070**

Prep Date: **8/4/2022** Analysis Date: **8/6/2022** SeqNo: **3210465** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.0	80	120			
Toluene	0.99	0.050	1.000	0	99.1	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.6	80	120			
Xylenes, Total	3.0	0.10	3.000	0	98.6	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	70	130			

Sample ID: **mb-69269** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **69269** RunNo: **90070**

Prep Date: **8/4/2022** Analysis Date: **8/6/2022** SeqNo: **3210467** 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	0.99		1.000		99.1	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: 2208251

RcptNo: 1

Received By: Juan Rojas 8/4/2022 7:04:00 AM

Completed By: Sean Livingston 8/4/2022 8:47:09 AM

Reviewed By: JR 8/4/22

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: KRC 8/04/22

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	1.1	Good				
2	0.5	Good				

Chain-of-Custody Record

Client: Vertex (EOG, Chase Settle)

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☒ Rush 5 day

Project Name: Irish Hills Pipeline

Project #: 22E-00716-02

Project Manager: Monica Peppin

Sampler: L. Pullman

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 0.9+0.2=1.1 (°C) 0.3+0.2=0.5

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. 2208251	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)
8-2-22	09:30	Soil	BH22-01 0'	1 Jar		001	X	X					X			
8-2-22	15:05	Soil	BH22-01 16'	1 Jar		002	X	X					X			
8-2-22	15:15	Soil	BH22-01 18'	1 Jar		003	X	X					X			
	15:25		BH22-01 20'			004										
	09:05		BH22-02 0'			005										
	~~0945~~ 0945		BH22-03 0'			006										
	13:00		BH22-03 14'			007										
	1305		BH22-03 16'			008										
	09:10		BH22-04 0'			009										
	10:30		SS22-01 0'			010										
	10:35		SS22-02 0'			011										
	10:35		SS22-03 0'			012										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
8-3-2022	07:00	Lakin Pullman				
8/3/22	1900				8/3/22	700
					8/4/22	7:04

Remarks: Direct Bill to EOG, Chase Settle cc. MPeppin for final Report
HOLD on samples 002, 003, 004 007, 008 per Lakin P.

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. SEE 8/4

Chain-of-Custody Record

Client: Vertex (EOG, Chase Settle)

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☑ Rush 5 days

Project Name: Irish Hills Pipeline

Project #: 226-00715-02

Project Manager: Monica Peppin

Sampler: L. Pullman

On Ice: ☐ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 0.2 to 2 = 1.1 (°C)

0.3 to 2 = 0.5

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)
8-2-22	10:40	Soil	SS22-04 0'	1 Jar		013	X	X					X			
8-2-22	11:30	Soil	SS22-05 0'	1 Jar		014	X	X					X			
8-2-22	11:35	Soil	SS22-06 0'	1 Jar		015	X	X					X			
8-2-22	11:40	Soil	SS22-07 0'	1 Jar		016	X	X					X			
8-2-22	13:10	Soil	BH22-03 18' Hold	1 Jar		017										
8-2-22	13:25	Soil	BH22-03 20' Hold	1 Jar		018										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
8-3-22	07:00	Lakin Pullman				
8/3/22	900			courier	8/4/22	7:04

Remarks: Hold BH22-03 18' and BH22-03 20'
Direct Bill to EOG, Chase Settle
cc. M. Peppin for Final Report

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.

15:05, BH22-01 16' – Please HOLD
15:15, BH22-01 18' – Please HOLD
15:25, BH22-01 20' – Please HOLD
13:00, BH22-03 14' – Please HOLD
13:05, BH22-03 16' – Please HOLD

Please let me know if you have any questions.

Thanks,

Lakin Pullman

Lakin Pullman
Environmental Technician

Vertex Resource Services Inc.
3101 Boyd Drive
Carlsbad, NM 88220

C 701.495.1722

www.vertex.ca
Connect with LinkedIn

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 16, 2022

Monica Peppin

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

RE: Irish Hills Pipeline OrderNo.: 2208416

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 24 sample(s) on 8/6/2022 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 **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-12 0'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 9:40:00 AM
Lab ID: 2208416-001 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/10/2022 9:34:45 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/10/2022 9:34:45 PM
Surr: DNOP	58.9	21-129		%Rec	1	8/10/2022 9:34:45 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 1:45:00 AM
Surr: BFB	87.7	37.7-212		%Rec	1	8/10/2022 1:45:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 1:45:00 AM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 1:45:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 1:45:00 AM
Xylenes, Total	ND	0.097		mg/Kg	1	8/10/2022 1:45:00 AM
Surr: 4-Bromofluorobenzene	79.5	70-130		%Rec	1	8/10/2022 1:45:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/11/2022 9:30:06 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		

Analytical Report
Lab Order **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-12 2'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 10:10:00 AM
Lab ID: 2208416-002 **Matrix:** SOIL
Received Date: 8/6/2022 10:30:00 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	8/10/2022 9:50:24 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/10/2022 9:50:24 PM
Surr: DNOP	64.4	21-129		%Rec	1	8/10/2022 9:50:24 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 2:05:00 AM
Surr: BFB	85.9	37.7-212		%Rec	1	8/10/2022 2:05:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 2:05:00 AM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 2:05:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 2:05:00 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/10/2022 2:05:00 AM
Surr: 4-Bromofluorobenzene	76.9	70-130		%Rec	1	8/10/2022 2:05:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	930	60		mg/Kg	20	8/11/2022 10:07:20 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 **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-12 4'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 10:15:00 AM
Lab ID: 2208416-003 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/10/2022 10:06:12 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/10/2022 10:06:12 PM
Surr: DNOP	78.6	21-129		%Rec	1	8/10/2022 10:06:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 2:24:00 AM
Surr: BFB	86.2	37.7-212		%Rec	1	8/10/2022 2:24:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 2:24:00 AM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 2:24:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 2:24:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 2:24:00 AM
Surr: 4-Bromofluorobenzene	78.5	70-130		%Rec	1	8/10/2022 2:24:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	1400	60		mg/Kg	20	8/11/2022 11:09:23 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 **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-14 0'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 10:50:00 AM
Lab ID: 2208416-007 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 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	8/10/2022 11:10:13 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/10/2022 11:10:13 PM
Surr: DNOP	44.2	21-129		%Rec	1	8/10/2022 11:10:13 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/10/2022 3:43:00 AM
Surr: BFB	84.8	37.7-212		%Rec	1	8/10/2022 3:43:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/10/2022 3:43:00 AM
Toluene	ND	0.048		mg/Kg	1	8/10/2022 3:43:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	8/10/2022 3:43:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	8/10/2022 3:43:00 AM
Surr: 4-Bromofluorobenzene	77.4	70-130		%Rec	1	8/10/2022 3:43:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/12/2022 1:13:27 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 **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-14 2'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 10:55:00 AM
Lab ID: 2208416-008 **Matrix:** SOIL
Received Date: 8/6/2022 10:30:00 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	8/10/2022 11:25:57 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/10/2022 11:25:57 PM
Surr: DNOP	55.0	21-129		%Rec	1	8/10/2022 11:25:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/10/2022 4:03:00 AM
Surr: BFB	86.9	37.7-212		%Rec	1	8/10/2022 4:03:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	8/10/2022 4:03:00 AM
Toluene	ND	0.049		mg/Kg	1	8/10/2022 4:03:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/10/2022 4:03:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/10/2022 4:03:00 AM
Surr: 4-Bromofluorobenzene	78.0	70-130		%Rec	1	8/10/2022 4:03:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	1000	59		mg/Kg	20	8/12/2022 1:25:51 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 **2208416**
Date Reported: **8/16/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-14 4'
Project: Irish Hills Pipeline
Collection Date: 8/4/2022 11:00:00 AM
Lab ID: 2208416-009 **Matrix:** SOIL **Received Date:** 8/6/2022 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	15		mg/Kg	1	8/9/2022 1:23:06 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/9/2022 1:23:06 PM
Surr: DNOP	82.1	21-129		%Rec	1	8/9/2022 1:23:06 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/9/2022 10:56:37 PM
Surr: BFB	101	37.7-212		%Rec	1	8/9/2022 10:56:37 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	8/9/2022 10:56:37 PM
Toluene	ND	0.049		mg/Kg	1	8/9/2022 10:56:37 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/9/2022 10:56:37 PM
Xylenes, Total	ND	0.097		mg/Kg	1	8/9/2022 10:56:37 PM
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	1	8/9/2022 10:56:37 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	1000	60		mg/Kg	20	8/12/2022 1:38:15 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **MB-69429** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69429** RunNo: **90190**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217678** Units: **mg/Kg**

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

Sample ID: **LCS-69429** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69429** RunNo: **90190**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217679** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.9	90	110			

Sample ID: **MB-69438** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69438** RunNo: **90190**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217680** Units: **mg/Kg**

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

Sample ID: **LCS-69438** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69438** RunNo: **90190**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217681** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.1	90	110			

Sample ID: **MB-69449** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **69449** RunNo: **90187**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217872** Units: **mg/Kg**

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

Sample ID: **LCS-69449** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **69449** RunNo: **90187**
Prep Date: **8/11/2022** Analysis Date: **8/11/2022** SeqNo: **3217873** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	100	90	110			

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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **2208416-010AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-15 0'** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212915** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	40	14	47.66	0	83.0	36.1	154			
Surr: DNOP	3.7		4.766		77.1	21	129			

Sample ID: **2208416-010AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-15 0'** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212916** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	34	15	49.07	0	69.1	36.1	154	15.3	33.9	
Surr: DNOP	2.8		4.907		57.6	21	129	0	0	

Sample ID: **LCS-69340** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212922** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	15	50.00	0	89.3	64.4	127			
Surr: DNOP	4.6		5.000		91.3	21	129			

Sample ID: **MB-69340** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69340** RunNo: **90104**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3212924** 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	9.8		10.00		98.4	21	129			

Sample ID: **MB-69368** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69368** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/10/2022** SeqNo: **3216082** 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	15		10.00		147	21	129			S

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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **LCS-69368** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69368** RunNo: **90146**
Prep Date: **8/9/2022** Analysis Date: **8/10/2022** SeqNo: **3216083** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	15	50.00	0	82.4	64.4	127			
Surr: DNOP	4.4		5.000		88.1	21	129			

Sample ID: **MB-69457** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **69457** RunNo: **90218**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3218061** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.7		10.00		97.3	21	129			

Sample ID: **LCS-69457** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **69457** RunNo: **90218**
Prep Date: **8/12/2022** Analysis Date: **8/12/2022** SeqNo: **3218062** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.7		5.000		94.3	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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **lcs-69324**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **69324**	RunNo: **90133**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213247**	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	99.0	72.3	137			
Surr: BFB	1900		1000		188	37.7	212			

Sample ID: **mb-69324**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **69324**	RunNo: **90133**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213248**	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		86.4	37.7	212			

Sample ID: **2208416-009ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BH22-14 4'**	Batch ID: **69333**	RunNo: **90135**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213390**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	4.9	24.68	0	119	70	130			
Surr: BFB	2200		987.2		221	37.7	212			S

Sample ID: **2208416-009amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BH22-14 4'**	Batch ID: **69333**	RunNo: **90135**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213391**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	4.9	24.27	0	118	70	130	2.98	20	
Surr: BFB	2100		970.9		221	37.7	212	0	0	S

Sample ID: **LCS-69333**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **69333**	RunNo: **90135**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213405**	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	101	72.3	137			
Surr: BFB	2000		1000		202	37.7	212			

Sample ID: **mb-69333**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **69333**	RunNo: **90135**							
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213406**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **mb-69333**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **69333**	RunNo: **90135**
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213406** 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	1000		1000		101	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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **lcs-69324** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **69324** RunNo: **90133**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3213295** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.025	1.000	0	82.8	80	120			
Toluene	0.83	0.050	1.000	0	83.2	80	120			
Ethylbenzene	0.82	0.050	1.000	0	82.2	80	120			
Xylenes, Total	2.4	0.10	3.000	0	81.2	80	120			
Surr: 4-Bromofluorobenzene	0.77		1.000		77.2	70	130			

Sample ID: **mb-69324** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **69324** RunNo: **90133**
Prep Date: **8/8/2022** Analysis Date: **8/9/2022** SeqNo: **3213296** 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	0.77		1.000		77.0	70	130			

Sample ID: **2208416-010ams** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-15 0'** Batch ID: **69333** RunNo: **90135**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3213409** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9862	0	104	68.8	120			
Toluene	1.1	0.049	0.9862	0.01226	109	73.6	124			
Ethylbenzene	1.1	0.049	0.9862	0	112	72.7	129			
Xylenes, Total	3.3	0.099	2.959	0	111	75.7	126			
Surr: 4-Bromofluorobenzene	1.0		0.9862		102	70	130			

Sample ID: **2208416-010amsd** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-15 0'** Batch ID: **69333** RunNo: **90135**
Prep Date: **8/8/2022** Analysis Date: **8/10/2022** SeqNo: **3213410** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	0.9804	0	98.8	68.8	120	5.44	20	
Toluene	1.0	0.049	0.9804	0.01226	104	73.6	124	5.20	20	
Ethylbenzene	1.0	0.049	0.9804	0	107	72.7	129	4.85	20	
Xylenes, Total	3.1	0.098	2.941	0	106	75.7	126	4.90	20	
Surr: 4-Bromofluorobenzene	1.0		0.9804		104	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix 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#: **2208416**
16-Aug-22

Client: Vertex Resources Services, Inc.
Project: Irish Hills Pipeline

Sample ID: **lcs-69333**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **69333**	RunNo: **90135**
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213423** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	90.9	80	120			
Toluene	0.94	0.050	1.000	0	94.1	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.5	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	70	130			

Sample ID: **mb-69333**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **69333**	RunNo: **90135**
Prep Date: **8/8/2022**	Analysis Date: **8/9/2022**	SeqNo: **3213424** 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	0.99		1.000		99.0	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

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: 2208416

RcptNo: 1

Received By: Tracy Casarrubias 8/6/2022 10:30:00 AM

Completed By: Tracy Casarrubias SCL 8/8/22 8/6/2022 12:17:35 PM

Reviewed By: SCL 8/8/22 8/8/22

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: JN 8/8/22

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	3.7	Good	Yes			
2	4.5	Good	Yes			

Chain-of-Custody Record

Client: Vertex (EOG, Chase Settle)

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☑ Rush 5 Day

Project Name: Irish Hills Pipeline

Project #: 226-00716-02

Project Manager: Monica Peppin

Sampler: L. Pullman

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 3.5 +0.2 = 3.7 (°C)
4.3 +0.2 4.5°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. 2208416	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)
8-4-22	13:00	Soil	BH22-16 0'	1 Jar		013	X	X					X			
8-4-22	13:05	Soil	BH22-16 2'	1 Jar		014	X	X					X			
8-4-22	13:10	Soil	BH22-16 4'	1 Jar		015	X	X					X			
8-4-22	13:30	Soil	BH22-17 0'	1 Jar		016	X	X					X			
	13:35		BH22-17 2'			017										
	13:40		BH22-17 4'			018										
	14:30		BH22-18 0'			019										
	14:35		BH22-18 2'			020										
	14:40		BH22-18 4'			021										
	15:15		BH22-19 0'			022										
	15:20		BH22-19 2'			023										
	15:25		BH22-19 4'			024										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
8-5-22	06:30	Lakyn Pullman				
8/5/22	1700				8/5/22	730
				Courier	8/6/22	10:30

Remarks:
Direct bill to EOG, Chase Settle.
cc. Monica Peppin for final Report.

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: Vertex (EOG, Chase Settle)

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☑ Rush 5 Day

Project Name: Irish Hills-Pipeline

Project #: 22E-00716-02

Project Manager: Monica Peppin

Sampler: L. Pullman

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(Including CF): 3.5+0.2 =3.7 (°C)
4.3+0.2 =4.5

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. 2208416	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)
8-4-22	9:40	Soil	BH22-12 0'	1 Jar		001	X	X					X			
8-4-22	10:10	Soil	BH22-12 2'	1 Jar		002	X	X					X			
8-4-22	10:15	Soil	BH22-12 4'	1 Jar		003	X	X					X			
8-4-22	10:30	Soil	BH22-13 0'	1 Jar		004	X	X					X			
	10:35		BH22-13 2'			005										
	10:40		BH22-13 4'			006										
	10:50		BH22-14 0'			007										
	10:55		BH22-14 2'			008										
	11:00		BH22-14 4'			009										
	11:30		BH22-15 0'			010										
	11:35		BH22-15 2'			011										
	11:40		BH22-15 4'			012										

Date	Time	Relinquished by	Received by	Via	Date	Time
8-5-22	0630	Luke Pullman				
8/5/22	1700				8/5/22	730
					8/10/22	10:30

Remarks:
Direct bill to EOG, Chase Settle
cc. M. Peppin for Final Report

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

April 06, 2023

Chance Dixon

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

RE: Irish Hill Area 2 OrderNo.: 2303E67

Dear Chance Dixon:

Hall Environmental Analysis Laboratory received 22 sample(s) on 3/30/2023 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 **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-01 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:00:00 AM
Lab ID: 2303E67-001 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/3/2023 6:17:26 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/3/2023 6:17:26 PM
Surr: DNOP	69.5	69-147		%Rec	1	4/3/2023 6:17:26 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/31/2023 10:24:00 PM
Surr: BFB	92.1	37.7-212		%Rec	1	3/31/2023 10:24:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	3/31/2023 10:24:00 PM
Toluene	ND	0.050		mg/Kg	1	3/31/2023 10:24:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	3/31/2023 10:24:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	3/31/2023 10:24:00 PM
Surr: 4-Bromofluorobenzene	88.1	70-130		%Rec	1	3/31/2023 10:24:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 12:58:17 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-02 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:05:00 AM
Lab ID: 2303E67-002 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	4/1/2023 4:17:55 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/1/2023 4:17:55 AM
Surr: DNOP	71.9	69-147		%Rec	1	4/1/2023 4:17:55 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/31/2023 11:29:00 PM
Surr: BFB	89.0	37.7-212		%Rec	1	3/31/2023 11:29:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	3/31/2023 11:29:00 PM
Toluene	ND	0.048		mg/Kg	1	3/31/2023 11:29:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	3/31/2023 11:29:00 PM
Xylenes, Total	ND	0.096		mg/Kg	1	3/31/2023 11:29:00 PM
Surr: 4-Bromofluorobenzene	87.3	70-130		%Rec	1	3/31/2023 11:29:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 1:10:39 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-03 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:10:00 AM
Lab ID: 2303E67-003 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	4/1/2023 4:38:44 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/1/2023 4:38:44 AM
Surr: DNOP	82.6	69-147		%Rec	1	4/1/2023 4:38:44 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/1/2023 12:33:00 AM
Surr: BFB	89.5	37.7-212		%Rec	1	4/1/2023 12:33:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 12:33:00 AM
Toluene	ND	0.050		mg/Kg	1	4/1/2023 12:33:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	4/1/2023 12:33:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	4/1/2023 12:33:00 AM
Surr: 4-Bromofluorobenzene	89.5	70-130		%Rec	1	4/1/2023 12:33:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 1:23:03 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-04 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:15:00 AM
Lab ID: 2303E67-004 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 4:49:14 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/1/2023 4:49:14 AM
Surr: DNOP	84.8	69-147		%Rec	1	4/1/2023 4:49:14 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 12:55:00 AM
Surr: BFB	93.8	37.7-212		%Rec	1	4/1/2023 12:55:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 12:55:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 12:55:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 12:55:00 AM
Xylenes, Total	ND	0.095		mg/Kg	1	4/1/2023 12:55:00 AM
Surr: 4-Bromofluorobenzene	91.4	70-130		%Rec	1	4/1/2023 12:55:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 1:35:26 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-05 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:20:00 AM
Lab ID: 2303E67-005 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 4:59:43 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/1/2023 4:59:43 AM
Surr: DNOP	88.8	69-147		%Rec	1	4/1/2023 4:59:43 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/1/2023 1:17:00 AM
Surr: BFB	86.3	37.7-212		%Rec	1	4/1/2023 1:17:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 1:17:00 AM
Toluene	ND	0.048		mg/Kg	1	4/1/2023 1:17:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	4/1/2023 1:17:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	4/1/2023 1:17:00 AM
Surr: 4-Bromofluorobenzene	88.2	70-130		%Rec	1	4/1/2023 1:17:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 1:47:49 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-06 0-4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:25:00 AM
Lab ID: 2303E67-006 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 5:10:12 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/1/2023 5:10:12 AM
Surr: DNOP	69.8	69-147		%Rec	1	4/1/2023 5:10:12 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/1/2023 1:38:00 AM
Surr: BFB	90.8	37.7-212		%Rec	1	4/1/2023 1:38:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 1:38:00 AM
Toluene	ND	0.048		mg/Kg	1	4/1/2023 1:38:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	4/1/2023 1:38:00 AM
Xylenes, Total	ND	0.097		mg/Kg	1	4/1/2023 1:38:00 AM
Surr: 4-Bromofluorobenzene	88.8	70-130		%Rec	1	4/1/2023 1:38:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 2:00:12 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-01 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:30:00 AM
Lab ID: 2303E67-007 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 5:20:40 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/1/2023 5:20:40 AM
Surr: DNOP	72.4	69-147		%Rec	1	4/1/2023 5:20:40 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/1/2023 2:00:00 AM
Surr: BFB	91.4	37.7-212		%Rec	1	4/1/2023 2:00:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 2:00:00 AM
Toluene	ND	0.050		mg/Kg	1	4/1/2023 2:00:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	4/1/2023 2:00:00 AM
Xylenes, Total	ND	0.10		mg/Kg	1	4/1/2023 2:00:00 AM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	4/1/2023 2:00:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 2:12:35 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-02 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:35:00 AM
Lab ID: 2303E67-008 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	4/4/2023 2:37:52 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/4/2023 2:37:52 PM
Surr: DNOP	82.8	69-147		%Rec	1	4/4/2023 2:37:52 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/1/2023 2:21:00 AM
Surr: BFB	88.1	37.7-212		%Rec	1	4/1/2023 2:21:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 2:21:00 AM
Toluene	ND	0.048		mg/Kg	1	4/1/2023 2:21:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	4/1/2023 2:21:00 AM
Xylenes, Total	ND	0.095		mg/Kg	1	4/1/2023 2:21:00 AM
Surr: 4-Bromofluorobenzene	88.7	70-130		%Rec	1	4/1/2023 2:21:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 2:24:57 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-03 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:40:00 AM
Lab ID: 2303E67-009 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/4/2023 3:01:36 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/4/2023 3:01:36 PM
Surr: DNOP	86.3	69-147		%Rec	1	4/4/2023 3:01:36 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 2:43:00 AM
Surr: BFB	92.0	37.7-212		%Rec	1	4/1/2023 2:43:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 2:43:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 2:43:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 2:43:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	4/1/2023 2:43:00 AM
Surr: 4-Bromofluorobenzene	89.2	70-130		%Rec	1	4/1/2023 2:43:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 3:02:06 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-04 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:45:00 AM
Lab ID: 2303E67-010 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 6:12:30 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/1/2023 6:12:30 AM
Surr: DNOP	72.9	69-147		%Rec	1	4/1/2023 6:12:30 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 3:04:00 AM
Surr: BFB	91.0	37.7-212		%Rec	1	4/1/2023 3:04:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	4/1/2023 3:04:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 3:04:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 3:04:00 AM
Xylenes, Total	ND	0.093		mg/Kg	1	4/1/2023 3:04:00 AM
Surr: 4-Bromofluorobenzene	90.6	70-130		%Rec	1	4/1/2023 3:04:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 3:14:30 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-05 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:50:00 AM
Lab ID: 2303E67-011 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	4/3/2023 4:18:30 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	4/3/2023 4:18:30 PM
Surr: DNOP	70.6	69-147		%Rec	1	4/3/2023 4:18:30 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/1/2023 3:47:00 AM
Surr: BFB	87.0	37.7-212		%Rec	1	4/1/2023 3:47:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 3:47:00 AM
Toluene	ND	0.049		mg/Kg	1	4/1/2023 3:47:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	4/1/2023 3:47:00 AM
Xylenes, Total	ND	0.098		mg/Kg	1	4/1/2023 3:47:00 AM
Surr: 4-Bromofluorobenzene	88.4	70-130		%Rec	1	4/1/2023 3:47:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 3:26:53 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-06 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 9:55:00 AM
Lab ID: 2303E67-012 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	4/1/2023 6:33:31 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/1/2023 6:33:31 AM
Surr: DNOP	77.1	69-147		%Rec	1	4/1/2023 6:33:31 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 4:09:00 AM
Surr: BFB	91.7	37.7-212		%Rec	1	4/1/2023 4:09:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	4/1/2023 4:09:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 4:09:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 4:09:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	4/1/2023 4:09:00 AM
Surr: 4-Bromofluorobenzene	88.5	70-130		%Rec	1	4/1/2023 4:09:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 3:39:16 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-07 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:00:00 AM
Lab ID: 2303E67-013 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	4/1/2023 6:44:00 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/1/2023 6:44:00 AM
Surr: DNOP	75.3	69-147		%Rec	1	4/1/2023 6:44:00 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/1/2023 4:31:00 AM
Surr: BFB	93.1	37.7-212		%Rec	1	4/1/2023 4:31:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 4:31:00 AM
Toluene	ND	0.048		mg/Kg	1	4/1/2023 4:31:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	4/1/2023 4:31:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	4/1/2023 4:31:00 AM
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	4/1/2023 4:31:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 3:51:38 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-08 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:05:00 AM
Lab ID: 2303E67-014 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	4/1/2023 7:04:55 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/1/2023 7:04:55 AM
Surr: DNOP	70.9	69-147		%Rec	1	4/1/2023 7:04:55 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/1/2023 4:52:00 AM
Surr: BFB	91.1	37.7-212		%Rec	1	4/1/2023 4:52:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 4:52:00 AM
Toluene	ND	0.050		mg/Kg	1	4/1/2023 4:52:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	4/1/2023 4:52:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	4/1/2023 4:52:00 AM
Surr: 4-Bromofluorobenzene	87.9	70-130		%Rec	1	4/1/2023 4:52:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	69	60		mg/Kg	20	3/31/2023 4:04:02 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-09 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:10:00 AM
Lab ID: 2303E67-015 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	4/1/2023 7:15:20 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/1/2023 7:15:20 AM
Surr: DNOP	80.1	69-147		%Rec	1	4/1/2023 7:15:20 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/1/2023 5:14:00 AM
Surr: BFB	86.2	37.7-212		%Rec	1	4/1/2023 5:14:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 5:14:00 AM
Toluene	ND	0.049		mg/Kg	1	4/1/2023 5:14:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	4/1/2023 5:14:00 AM
Xylenes, Total	ND	0.097		mg/Kg	1	4/1/2023 5:14:00 AM
Surr: 4-Bromofluorobenzene	87.3	70-130		%Rec	1	4/1/2023 5:14:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 4:16:25 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-10 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:15:00 AM
Lab ID: 2303E67-016 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	4/3/2023 4:42:17 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/3/2023 4:42:17 PM
Surr: DNOP	93.8	69-147		%Rec	1	4/3/2023 4:42:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 5:35:00 AM
Surr: BFB	87.9	37.7-212		%Rec	1	4/1/2023 5:35:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	4/1/2023 5:35:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 5:35:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 5:35:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	4/1/2023 5:35:00 AM
Surr: 4-Bromofluorobenzene	87.2	70-130		%Rec	1	4/1/2023 5:35:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	62	59		mg/Kg	20	3/31/2023 4:53:34 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-11 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:20:00 AM
Lab ID: 2303E67-017 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	4/3/2023 5:06:03 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	4/3/2023 5:06:03 PM
Surr: DNOP	71.7	69-147		%Rec	1	4/3/2023 5:06:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/1/2023 5:57:00 AM
Surr: BFB	89.2	37.7-212		%Rec	1	4/1/2023 5:57:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	4/1/2023 5:57:00 AM
Toluene	ND	0.048		mg/Kg	1	4/1/2023 5:57:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	4/1/2023 5:57:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	4/1/2023 5:57:00 AM
Surr: 4-Bromofluorobenzene	88.0	70-130		%Rec	1	4/1/2023 5:57:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	62	60		mg/Kg	20	3/31/2023 5:30:44 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-12 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:25:00 AM
Lab ID: 2303E67-018 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	4/3/2023 5:29:53 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/3/2023 5:29:53 PM
Surr: DNOP	98.3	69-147		%Rec	1	4/3/2023 5:29:53 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/1/2023 6:18:00 AM
Surr: BFB	88.6	37.7-212		%Rec	1	4/1/2023 6:18:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	4/1/2023 6:18:00 AM
Toluene	ND	0.047		mg/Kg	1	4/1/2023 6:18:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	4/1/2023 6:18:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	4/1/2023 6:18:00 AM
Surr: 4-Bromofluorobenzene	87.8	70-130		%Rec	1	4/1/2023 6:18:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 5:43:07 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-13 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:30:00 AM
Lab ID: 2303E67-019 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	4/3/2023 5:53:38 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/3/2023 5:53:38 PM
Surr: DNOP	76.2	69-147		%Rec	1	4/3/2023 5:53:38 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/1/2023 6:40:00 AM
Surr: BFB	90.6	37.7-212		%Rec	1	4/1/2023 6:40:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 6:40:00 AM
Toluene	ND	0.049		mg/Kg	1	4/1/2023 6:40:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	4/1/2023 6:40:00 AM
Xylenes, Total	ND	0.098		mg/Kg	1	4/1/2023 6:40:00 AM
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	4/1/2023 6:40:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 5:55:31 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-14 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:35:00 AM
Lab ID: 2303E67-020 **Matrix:** SOIL **Received Date:** 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	4/4/2023 1:26:52 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	4/4/2023 1:26:52 PM
Surr: DNOP	76.8	69-147		%Rec	1	4/4/2023 1:26:52 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/1/2023 7:01:00 AM
Surr: BFB	90.0	37.7-212		%Rec	1	4/1/2023 7:01:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 7:01:00 AM
Toluene	ND	0.049		mg/Kg	1	4/1/2023 7:01:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	4/1/2023 7:01:00 AM
Xylenes, Total	ND	0.098		mg/Kg	1	4/1/2023 7:01:00 AM
Surr: 4-Bromofluorobenzene	88.0	70-130		%Rec	1	4/1/2023 7:01:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 6:07:54 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-15 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:40:00 AM
Lab ID: 2303E67-021 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/31/2023 6:59:29 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/31/2023 6:59:29 PM
Surr: DNOP	83.5	69-147		%Rec	1	3/31/2023 6:59:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/1/2023 3:50:46 AM
Surr: BFB	98.0	37.7-212		%Rec	1	4/1/2023 3:50:46 AM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 3:50:46 AM
Toluene	ND	0.050		mg/Kg	1	4/1/2023 3:50:46 AM
Ethylbenzene	ND	0.050		mg/Kg	1	4/1/2023 3:50:46 AM
Xylenes, Total	ND	0.10		mg/Kg	1	4/1/2023 3:50:46 AM
Surr: 4-Bromofluorobenzene	88.7	70-130		%Rec	1	4/1/2023 3:50:46 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 6:20:17 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303E67**
Date Reported: **4/6/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-16 4'
Project: Irish Hill Area 2
Collection Date: 3/28/2023 10:45:00 AM
Lab ID: 2303E67-022 **Matrix:** SOIL
Received Date: 3/30/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	3/31/2023 7:10:12 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/31/2023 7:10:12 PM
Surr: DNOP	77.4	69-147		%Rec	1	3/31/2023 7:10:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/1/2023 4:14:07 AM
Surr: BFB	98.3	37.7-212		%Rec	1	4/1/2023 4:14:07 AM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	4/1/2023 4:14:07 AM
Toluene	ND	0.050		mg/Kg	1	4/1/2023 4:14:07 AM
Ethylbenzene	ND	0.050		mg/Kg	1	4/1/2023 4:14:07 AM
Xylenes, Total	ND	0.10		mg/Kg	1	4/1/2023 4:14:07 AM
Surr: 4-Bromofluorobenzene	88.3	70-130		%Rec	1	4/1/2023 4:14:07 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	3/31/2023 6:32:39 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	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **MB-74051** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **74051** RunNo: **95704**
Prep Date: **3/31/2023** Analysis Date: **3/31/2023** SeqNo: **3464385** Units: **mg/Kg**

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

Sample ID: **LCS-74051** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **74051** RunNo: **95704**
Prep Date: **3/31/2023** Analysis Date: **3/31/2023** SeqNo: **3464386** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.4	90	110			

Sample ID: **MB-74065** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **74065** RunNo: **95704**
Prep Date: **3/31/2023** Analysis Date: **3/31/2023** SeqNo: **3464415** Units: **mg/Kg**

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

Sample ID: **LCS-74065** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **74065** RunNo: **95704**
Prep Date: **3/31/2023** Analysis Date: **3/31/2023** SeqNo: **3464416** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.8	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 standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/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#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **MB-74022**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **PBS**	Batch ID: **74022**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3465046**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	12		10.00		118	69	147			

Sample ID: **MB-74039**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **PBS**	Batch ID: **74039**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **4/1/2023**	SeqNo: **3465048**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	12		10.00		123	69	147			

Sample ID: **MB-74042**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **PBS**	Batch ID: **74042**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3465049**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		97.5	69	147			

Sample ID: **LCS-74022**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **LCSS**	Batch ID: **74022**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3465051**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	6.1		5.000		121	69	147			

Sample ID: **LCS-74039**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **LCSS**	Batch ID: **74039**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **4/1/2023**	SeqNo: **3465053**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	100	61.9	130			
Surr: DNOP	6.2		5.000		125	69	147			

Sample ID: **LCS-74042**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**							
Client ID: **LCSS**	Batch ID: **74042**	RunNo: **95708**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3465054**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/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#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **LCS-74042** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **74042** RunNo: **95708**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3465054** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	10	50.00	0	78.9	61.9	130			
Surr: DNOP	4.7		5.000		93.5	69	147			

Sample ID: **MB-74102** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **74102** RunNo: **95770**
Prep Date: **4/4/2023** Analysis Date: **4/4/2023** SeqNo: **3466591** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.0		10.00		90.4	69	147			

Sample ID: **LCS-74102** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **74102** RunNo: **95770**
Prep Date: **4/4/2023** Analysis Date: **4/4/2023** SeqNo: **3466592** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	92.2	61.9	130			
Surr: DNOP	4.6		5.000		91.4	69	147			

Sample ID: **2303E67-020AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BES23-14 4'** Batch ID: **74039** RunNo: **95777**
Prep Date: **3/30/2023** Analysis Date: **4/4/2023** SeqNo: **3466645** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	34	10	49.90	0	67.6	54.2	135			
Surr: DNOP	2.8		4.990		56.9	69	147			S

Sample ID: **2303E67-020AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BES23-14 4'** Batch ID: **74039** RunNo: **95777**
Prep Date: **3/30/2023** Analysis Date: **4/4/2023** SeqNo: **3468374** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	24	8.9	44.44	0	54.2	54.2	135	33.2	29.2	RS
Surr: DNOP	2.0		4.444		44.5	69	147	0	0	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **lcs-74025**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **74025**	RunNo: **95703**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464818**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	81.5	70	130			
Surr: BFB	2000		1000		198	37.7	212			

Sample ID: **mb-74025**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **74025**	RunNo: **95703**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464821**	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	940		1000		93.9	37.7	212			

Sample ID: **2303E67-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **WES23-01 0-4'**	Batch ID: **74025**	RunNo: **95703**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464826**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.83	0	95.1	70	130			
Surr: BFB	2100		993.0		212	37.7	212			

Sample ID: **2303E67-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **WES23-01 0-4'**	Batch ID: **74025**	RunNo: **95703**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464828**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	24.95	0	103	70	130	8.18	20	
Surr: BFB	2200		998.0		222	37.7	212	0	0	S

Sample ID: **lcs-74028**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **74028**	RunNo: **95705**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464993**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	90.8	70	130			
Surr: BFB	1900		1000		195	37.7	212			

Sample ID: **mb-74028**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **74028**	RunNo: **95705**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464994**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/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#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **mb-74028**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **74028**	RunNo: **95705**							
Prep Date: **3/30/2023**	Analysis Date: **3/31/2023**	SeqNo: **3464994**	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	1000		1000		102	37.7	212			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/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 standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **lcs-74025** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **74025** RunNo: **95703**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3464881** 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	89.2	80	120			
Toluene	0.89	0.050	1.000	0	88.9	80	120			
Ethylbenzene	0.87	0.050	1.000	0	87.0	80	120			
Xylenes, Total	2.6	0.10	3.000	0	86.0	80	120			
Surr: 4-Bromofluorobenzene	0.93		1.000		92.5	70	130			

Sample ID: **mb-74025** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **74025** RunNo: **95703**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3464882** 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	0.91		1.000		90.7	70	130			

Sample ID: **2303E67-002ams** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **WES23-02 0-4'** Batch ID: **74025** RunNo: **95703**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3464885** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9709	0	98.7	68.8	120			
Toluene	0.98	0.049	0.9709	0	101	73.6	124			
Ethylbenzene	0.98	0.049	0.9709	0	101	72.7	129			
Xylenes, Total	2.9	0.097	2.913	0	100	75.7	126			
Surr: 4-Bromofluorobenzene	0.89		0.9709		91.8	70	130			

Sample ID: **2303E67-002amsd** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **WES23-02 0-4'** Batch ID: **74025** RunNo: **95703**
Prep Date: **3/30/2023** Analysis Date: **4/1/2023** SeqNo: **3464886** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.024	0.9690	0	101	68.8	120	2.50	20	
Toluene	1.0	0.048	0.9690	0	104	73.6	124	2.05	20	
Ethylbenzene	1.0	0.048	0.9690	0	104	72.7	129	2.58	20	
Xylenes, Total	3.0	0.097	2.907	0	103	75.7	126	2.74	20	
Surr: 4-Bromofluorobenzene	0.86		0.9690		88.4	70	130	0	0	

Qualifiers:

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ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/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#: **2303E67**
06-Apr-23

Client: Vertex Resources Services, Inc.
Project: Irish Hill Area 2

Sample ID: **LCS-74028** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **74028** RunNo: **95705**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3465021** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.3	80	120			
Toluene	0.92	0.050	1.000	0	92.3	80	120			
Ethylbenzene	0.91	0.050	1.000	0	91.1	80	120			
Xylenes, Total	2.7	0.10	3.000	0	90.9	80	120			
Surr: 4-Bromofluorobenzene	0.91		1.000		91.5	70	130			

Sample ID: **mb-74028** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **74028** RunNo: **95705**
Prep Date: **3/30/2023** Analysis Date: **3/31/2023** SeqNo: **3465022** 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	0.93		1.000		92.8	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 standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/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: 2303E67

RcptNo: 1

Received By: Tracy Casarrubias 3/30/2023 7:30:00 AM

Completed By: Tracy Casarrubias 3/30/2023 8:14:39 AM

Reviewed By: 3-30-23

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: _____ 3/30/23

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	5.2	Good	Yes	Yogi		

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 48hr

Project Name: Irish Hills Area 2

Project #: 23E-01490

Project Manager: Chance Dixon

Sampler: Hunter Klein

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 5.2-0=5.2 (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2303E67	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)
3/28/23	9:00	Soil	WES23-01 0-4'	4oz	Ice	001	X	X					X			
	9:05		WES23-02 0-4'			002	X	X					X			
	9:10		WES23-03 0-4'			003	X	X					X			
	9:15		WES23-04 0-4'			004	X	X					X			
	9:20		WES23-05 0-4'			005	X	X					X			
	9:25		WES23-06 0-4			006	X	X					X			
	9:30		BES23-01 ~~0-4~~ 4'			007	X	X					X			
	9:35		BES23-02 ~~0-~~ 4'			008	X	X					X			
	9:40		BES23-03 4'			009	X	X					X			
	9:45		BES23-04 4'			010	X	X					X			
	9:50		BES23-05 4'			011	X	X					X			
	9:55		BES23-06 4'			012	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
3/28/23	3:00	Hunter Klein			3/29/23	730
3/29/23	1900			Courier	3/30/23	7:30

Remarks:

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 hr

Project Name: Irish Hills Area 2

Project #: 23E-01490

Project Manager: Chance Dixon

Sampler: Hunter Klein

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 5.2-0=5.2 (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2303E07	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)
3/28/23	10:00	Soil	BES23-07 4'	4oz	Ice	013	X	X					X			
	10:05		BES23-08 4'			014	X	X					X			
	10:10		BES23-09 4'			015	X	X					X			
	10:15		BES23-10 4'			016	X	X					X			
	10:20		BES23-11 4'			017	X	X					X			
	10:25		BES23-12 4'			018	X	X					X			
	10:30		BES23-13 4'			019	X	X					X			
	10:35		BES23-14 4'			020	X	X					X			
	10:40		BES23-15 4'			021	X	X					X			
	10:45		BES23-16 4'			022	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
3/28/23	15:00	Hunter Klein				
3/29/23	1900				3/29/23	730
					3/30/23	7:30

Remarks:

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 210729

CONDITIONS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 210729
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	9/13/2023