Incident Number: nAPP2432462960

Release Assessment and Closure

Cranbrook State Com 1H

Unit J, Section 36, Township 15 South, Range 28 East

API: 30-005-64360

County: Chaves

Vertex File Number: 24E-04970

Prepared for:
Mack Energy Corporation

Prepared by:
Vertex Resource Services Inc.

Date:
February 2025

Release Assessment and Closure
Cranbrook State Com 1H
Unit J, Section 36, Township 15 South, Range 28 East
API: 30-005-64360
County: Chaves

Prepared for:
Mack Energy Corporation
11344 Lovington Highway
Artesia, New Mexico 88210

New Mexico Oil Conservation Division
506 West Texas Avenue
Artesia, New Mexico 88210

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John Rewis

2/13/2025

John Rewis, B.Sc.
ENVIRONMENTAL TECHNICIAN, REPORTING

Date

Sally Carttar

February 14, 2025

Sally Carttar, B.A
PROJECT MANAGER, REPORT REVIEW

Date

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1.0 Introduction

Mack Energy Corporation (Mack) retained Vertex Resource Services Inc. (Vertex) to conduct a Release Assessment and Closure for a crude oil release that occurred on November 19, 2024, at Cranbrook State Com 1H API 30-005-64360 (hereafter referred to as the "site"). Mack submitted an initial C-141 Release Notification to New Mexico Oil Conservation Division (NMOCD) on December 4, 2024. Incident ID number nAPP2432462960 was assigned to this incident.

This report provides a description of the release assessment and remediation activities associated with the site. The information presented demonstrates that closure criteria established in Table I of 19.15.29.12 of the *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) related to NMOCD has been met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NMOCD for closure of this release, with the understanding that restoration of the release site will be completed following remediation activities as per NMAC 19.15.29.13.

2.0 Incident Description

The release occurred on November 19, 2024 , due to the truck overflowing while loading crude off from the tank. The incident was reported on December 4, 2024, and involved the release of approximately 11 barrels (bbl.) of produced oil on the pad site. Approximately 0 bbl. of free fluid was removed during initial clean-up; however, Mack scraped the surface of the release area after the incident. Additional details relevant to the release are presented in the C-141 Report.

3.0 Site Characteristics

The site is located approximately 30 miles northeast of Artesia, New Mexico. The legal location for the site is Unit J, Section 36, Township 15 South, Range 28 East in Chaves County, New Mexico. The release area is located on State property. An aerial photograph and site schematic are presented on Figure 1.

The location is typical of oil and gas exploration and production sites in the Permian Basin and is currently used for oil and gas production and storage. The following sections specifically describe the release area on or in proximity to the constructed pad (Figure 1).

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2024) indicates the site's surface geology primarily comprises Qp – Piedmont Alluvial (Quaternary), and the soil at the site is characterized as sandy (United States Department of Agriculture, Natural Resources Conservation Service, 2024). Additional soil characteristics include a drainage class of well drained with a runoff class of medium. The karst geology potential for the site is Medium (Geomatics; United States Department of the Interior, Bureau of Land Management, 2018).

The surrounding landscape is associated with flood plains and swales with elevations ranging between 3,000 and 3,900 feet. The climate is semiarid with average annual precipitation ranging between 10 and 12 inches. Using information from the United States Department of Agriculture, the dominant vegetation was determined to be black grama. Black grama, dropseeds, blue grama dominate the historical plant community (United States Department of

Agriculture, Natural Resources Conservation Service, 2024). Limited to no vegetation is allowed to grow on the compacted production pad, right-of-way and access road.

4.0 Closure Criteria Determination

The nearest active well to the site is a New Mexico Office of the State Engineer (NMOSE) monitoring well located approximately 2.92 miles southwest of the site (United States Geological Survey, 2024). Data from 2008 shows the NMOSE borehole recorded a depth to groundwater of 49 feet below ground surface (bgs). Information pertaining to the depth to ground water determination is included in Appendix A.

There is no surface water present at the site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 0.89 miles southeast of the site (United States Fish and Wildlife Service, 2024).

At the site, there are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Table 1. Closure Criteria Determination			
Site Name: Cranbrook State Com 1H			
Spill Coordinates: 32.969914, -104.08414		**X: 585586.35**	**Y: 3648323.89**
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater (nearest reference)	125	feet
	Distance between release and nearest DTGW reference	**20,990**	feet
		3.98	miles
	Date of nearest DTGW reference measurement	**August 31, 2016**	
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	**205**	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	10,545	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	52,223	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**	170,363	feet
	ii) Within 1000 feet of any fresh water well or spring	20,990	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	981	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
	Distance between release and nearest registered mine	**114,075**	feet
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
	Distance between release and nearest unstable area	375	feet
10	Within a 100-year Floodplain	**500**	year
	Distance between release and nearest FEMA Zone A (100-year Floodplain)	10,361	feet
11	Soil Type	Pajarito-Pintura Complex	
12	Ecological Classification	R070BD004NM - Sandy	
13	Geology	Qp, Peidmont Alluvial Deposits	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	<50'	<50' 51-100' >100'

The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 2.

Table 2. Closure Criteria for Soils Impacted by a Release DTGW <50 feet bgs

Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	Constituent	Limit
< 50 feet	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

DTGW – depth to groundwater
bgs – below ground surface
TDS – total dissolved solids
TPH – total petroleum hydrocarbons, GRO – gas range organics, DRO – diesel range organics, MRO – motor oil range organics
BTEX – benzene, toluene, ethylbenzene and xylenes

5.0 Remedial Actions Taken

An initial site inspection of the release area was completed on November 20, 2024, which identified the area of the release specified in the initial C-141 Report, estimated the approximate volume of the release and white lined the area required for the One Call request. The impacted area was determined to be approximately 202 feet long and 44 feet wide; the total affected area is 5,535 square feet. The Daily Field Report (DFR) associated with the site inspection is included in Appendix B. Characterization sampling results are presented in Table 3.

Remediation efforts began on January 8, 2025, and were finalized on January 15, 2025. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on a total of 37 sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and Quantabs (chlorides). Field screening results were used to identify areas requiring further remediation. Soils were removed to a depth of 0.5 to 1 feet bgs. Impacted soil was transported by a licensed waste hauler and disposed of at an approved waste management facility as stipulated by the Form C-138 Request for Approval to Accept Solid Waste. Field screening results and DFRs documenting various phases of the remediation are presented in Appendix B.

Notification that confirmatory samples were being collected was provided to the NMOCD. Confirmatory composite samples were collected from the base and walls of the excavation in 200 square foot increments. A total of 37 confirmation samples were submitted to Eurofins Laboratory in Albuquerque, New Mexico, 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). Confirmatory laboratory results are presented in Table 4, and the laboratory data reports are included in Appendix C. All confirmatory samples collected and analyzed were below closure criteria for the site.

6.0 Closure Request

The release area was fully delineated, remediated, and backfilled with local soils. Confirmatory samples were analyzed by the laboratory and found to be below allowable concentrations as per the NMAC Closure Criteria for Soils Impacted by a Release locations “under 50 feet to groundwater”. Based on these findings, Mack Energy Corporation requests that this release be closed.

Should you have any questions or concerns, please do not hesitate to contact Sally Carttar at 575.361.3561 or Scarttar@vertexresource.com

7.0 References

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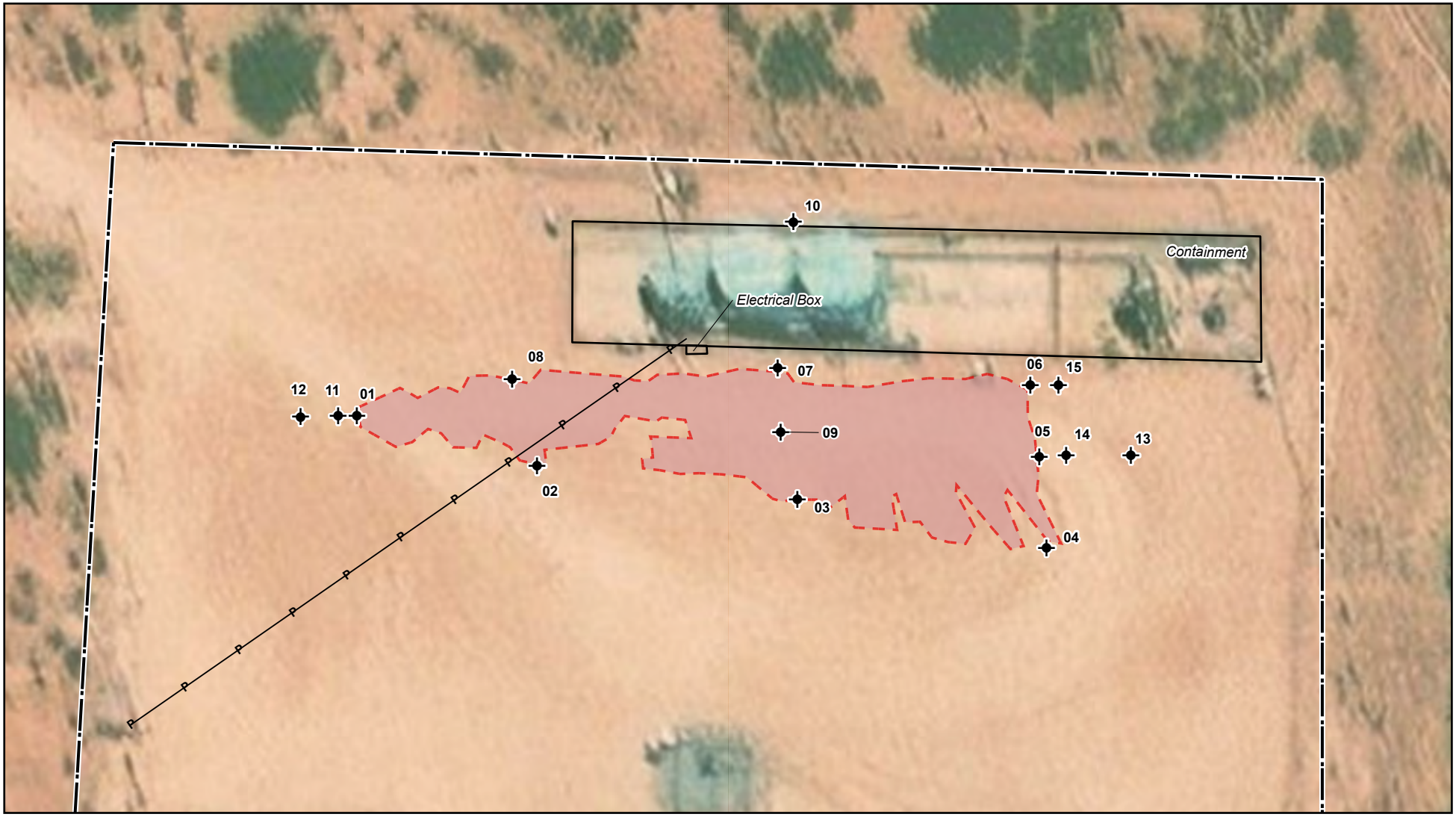
8.0 Limitations

This report has been prepared for the sole benefit of Mack Energy Corporation. 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 Mack Energy Corporation. 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.

FIGURES



Borehole (Prefixed by "BH24-")

Powerline

Approximate Lease Boundary

Infrastructure (Existing)

Release Area (~5,549 sq.ft)

VERTEX

0 25 50 ft

NAD 1983 UTM Zone 13N

Date: Feb 11/25

Map Center:
Lat/Long
32.9702°,-104.084122°

N

Characterization Sampling Site Schematic
Cranbrook State Com 1H

FIGURE:
1

MACK Energy Corporation

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: Georeferenced image from Esri, 2023. Approximate lease boundary from sketch by Vertex Professional Services Ltd. (Vertex), 2024. Site features from GPS, Vertex, 2024.

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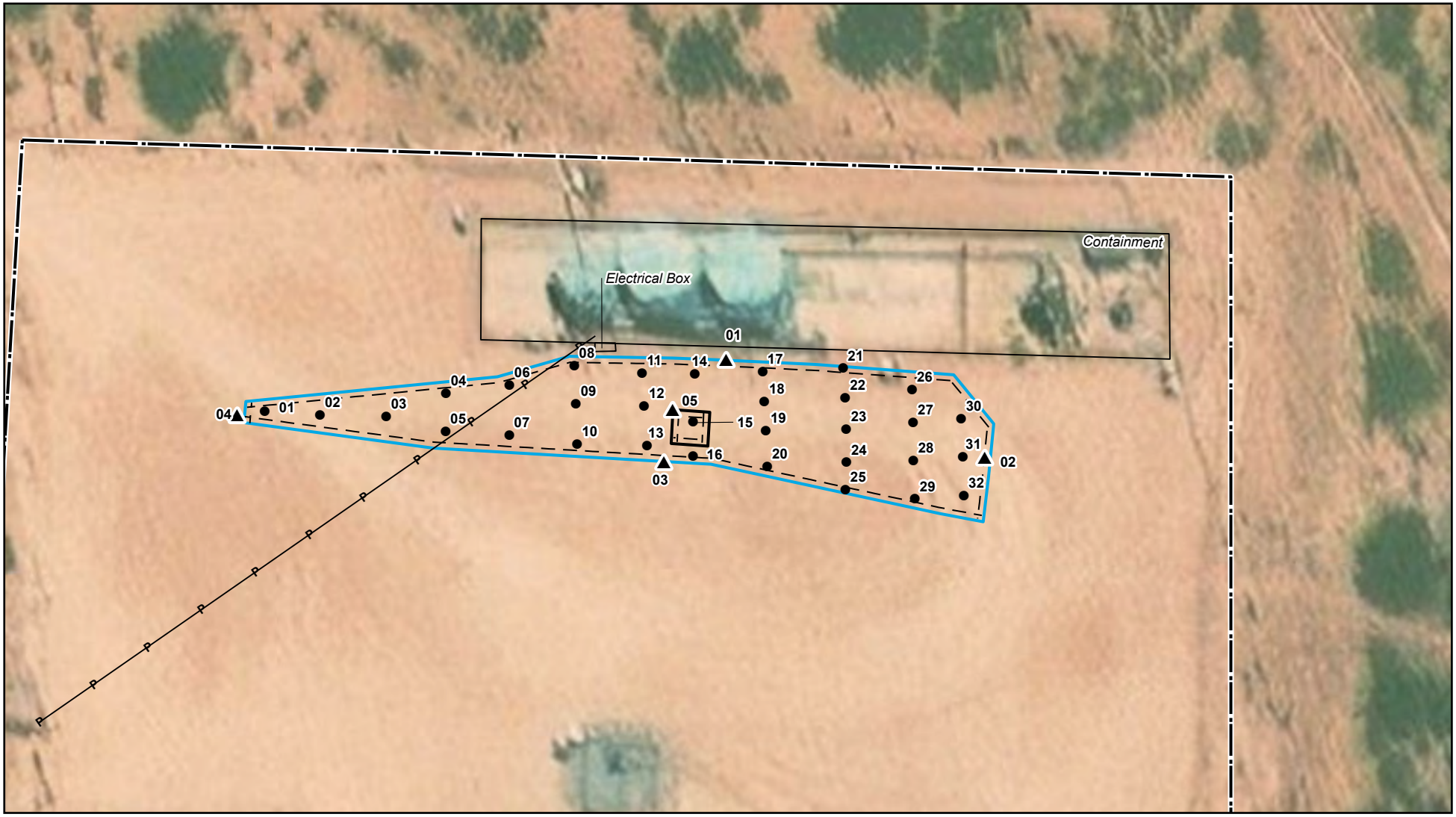

- Base Sample (Prefixed by "BS25-")
- Wall Sample (Prefixed by "WS25-")
- Powerline
- Approximate Lease Boundary
- Excavation to 1.1' bgs (~106 sq.ft. | 41 ft.)
- Excavation to 0.5' bgs (~5,731sq.ft. | 478 ft.)
- Infrastructure (Existing)

VERTEX

0 25 50 ft

NAD 1983 UTM Zone 13N

Date: Jan 24/25

Map Center:
Lat/Long
32.970197°,-104.084035°

N

Confirmation Sampling Schematic
Cranbrook State Com 1H

FIGURE:
2

MACK Energy Corporation

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: Georeferenced image from Esri, 2023. Approximate lease boundary from sketch by Vertex Professional Services Ltd. (Vertex), 2025. Site features from GPS, Vertex, 2024 & 2025.

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TABLES

Client Name: Mack Energy
Site Name: Cranbrook State Com 1H
NMOCD Tracking #: nAPP2432462960
Project #: 24E-04970
Lab Reports: 885-16239-1, 885-16360-1

Table 3. Initial Characterization Laboratory Results - Depth to Groundwater <50 feet bgs

Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH24-01	0	November 25, 2024	ND	ND	ND	17	ND	17	17	**1600**
BH24-02	0	November 25, 2024	ND	ND	ND	ND	ND	ND	ND	260
BH24-03	0	December 3, 2024	ND	ND	ND	ND	ND	ND	ND	590
	4	December 3, 2024	ND	ND	ND	ND	ND	ND	ND	73
BH24-04	0	December 3, 2024	ND	ND	ND	ND	ND	ND	ND	440
	4	December 3, 2024	ND	ND	ND	ND	ND	ND	ND	67
BH24-05	0	November 25, 2024	-	-	-	-	-	-	-	-
	2	November 25, 2024	-	-	-	-	-	-	-	-
	4	November 25, 2024	-	-	-	-	-	-	-	-
BH24-06	0	November 25, 2024	-	-	-	-	-	-	-	-
	2	December 10, 2024	-	-	-	-	-	-	-	-
	4	December 10, 2024	-	-	-	-	-	-	-	-
BH24-07	0	November 25, 2024	-	-	-	-	-	-	-	-
	2	November 25, 2024	-	-	-	-	-	-	-	-
	4	November 25, 2024	-	-	-	-	-	-	-	-
BH24-08	0	November 25, 2024	ND	ND	ND	ND	ND	ND	ND	420
	2	November 25, 2024	ND	ND	ND	ND	ND	ND	ND	190
BH24-09	0	November 25, 2024	-	-	-	-	-	-	-	-
	0.5	December 11, 2024	ND	ND	ND	ND	ND	ND	ND	590
	1	December 11, 2024	ND	ND	ND	ND	ND	ND	ND	**630**
	2	December 11, 2024	ND	ND	ND	ND	ND	ND	ND	160
BH24-10	0	November 26, 2024	ND	ND	ND	11	ND	11	11	ND
	2	December 10, 2024	ND	ND	ND	ND	ND	ND	ND	180
BH24-11	0	November 26, 2024	-	-	-	-	-	-	-	-
	2	November 26, 2024	-	-	-	-	-	-	-	-
	4	November 26, 2024	-	-	-	-	-	-	-	-
BH24-12	0	December 2, 2024	ND	ND	ND	ND	ND	ND	ND	300
	4	December 2, 2024	ND	ND	ND	ND	ND	ND	ND	200
BH24-13	0	December 2, 2024	ND	ND	ND	41	ND	41	41	64
	4	December 2, 2024	ND	ND	ND	ND	ND	ND	ND	ND
BH24-14	0	November 27, 2024	-	-	-	-	-	-	-	-
	2	November 27, 2024	-	-	-	-	-	-	-	-
	4	November 27, 2024	-	-	-	-	-	-	-	-
BH24-15	0	December 13, 2024	ND	ND	ND	ND	ND	ND	ND	540
	2	December 13, 2024	ND	ND	ND	ND	ND	ND	ND	95

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

VERTEX

Client Name: Mack Energy Corporation
Site Name: Cranbrook State Com 1H
NMOCD Tracking #: Napp2432462960
Project #: 24E-04970
Lab Report(sX): 885-18360-1, 885-18633-1

Table 4. Confirmatory Sample Laboratory Results

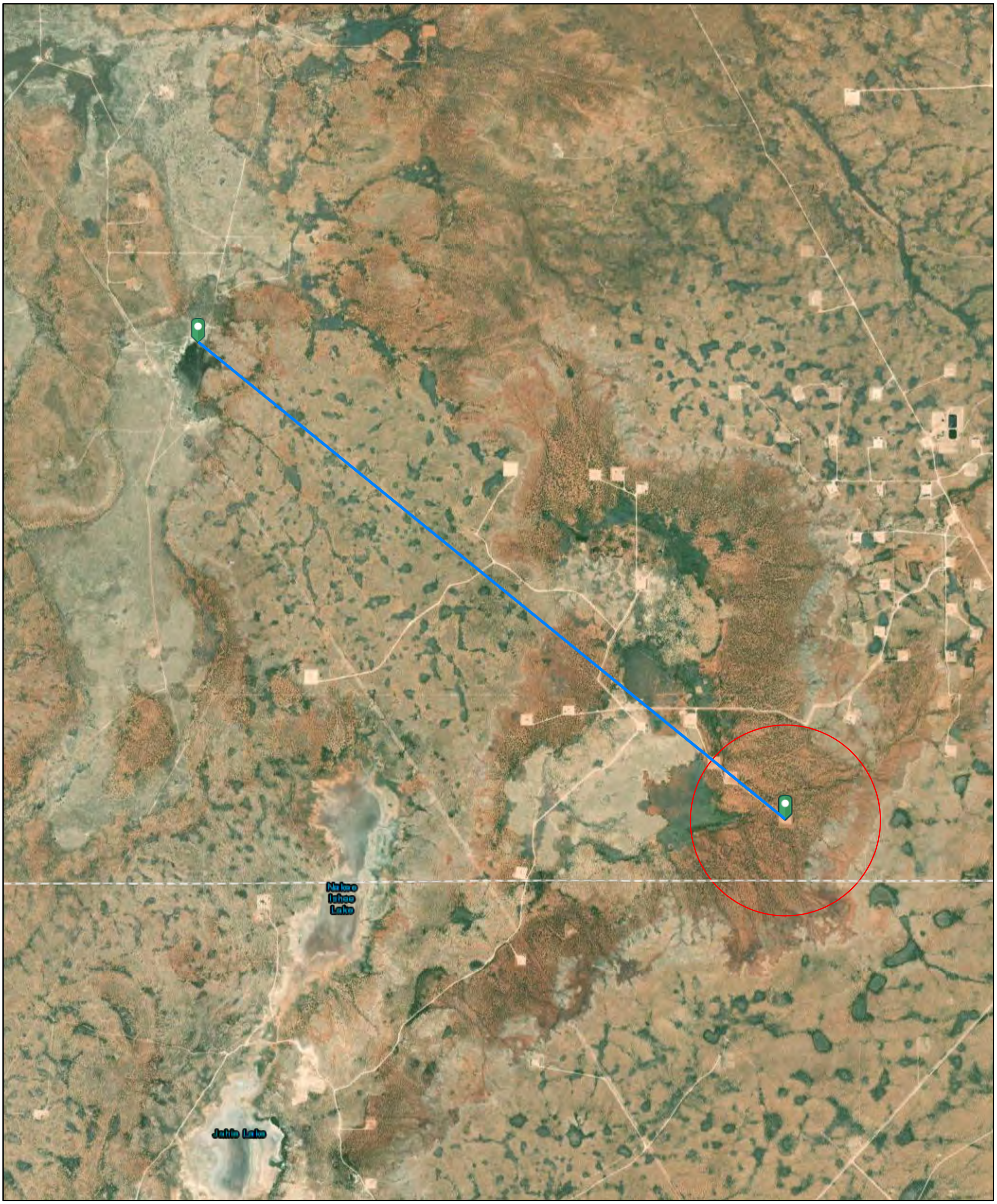
Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
			Depth to Groundwater <50							
BS25-01	0.5	January 10, 2025	ND	ND	ND	ND	ND	ND	ND	290
BS25-02	0.5	January 10, 2025	ND	ND	ND	ND	ND	ND	ND	96
BS25-03	0.5	January 10, 2025	ND	ND	ND	31	ND	31	31	84
BS25-04	0.5	January 10, 2025	ND	ND	ND	ND	ND	ND	ND	73
BS25-05	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	210
BS25-06	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	170
BS25-07	0.5	January 14, 2025	ND	ND	ND	17	ND	17	17	310
BS25-08	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	93
BS25-09	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	98
BS25-10	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	94
BS25-11	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	240
BS25-12	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	170
BS25-13	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	370
BS25-14	0.5	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	140
BS25-15	1	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	290
BS25-16	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	160
BS25-17	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	160
BS25-18	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	130
BS25-19	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	170
BS25-20	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	250
BS25-21	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	230
BS25-22	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	540
BS25-23	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	520
BS25-24	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	150
BS25-25	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	480
BS25-26	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	530
BS25-27	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	460
BS25-28	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	350
BS25-29	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	ND
BS25-30	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	ND
BS25-31	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	85
BS25-32	0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	280
WS25-01	0-0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	250
WS25-02	0-0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	93
WS25-03	0-0.5	January 15, 2025	ND	ND	ND	ND	ND	ND	ND	210
WS25-04	0-0.5	January 14, 2025	ND	ND	ND	16	ND	16	16	330
WS25-05	0.5-1	January 14, 2025	ND	ND	ND	ND	ND	ND	ND	460

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

VERTEX

APPENDIX A – Closure Criteria Research Documentation

OSE POD Location Map



1/19/2025, 1:08:33 PM

Override 1

OSE District Boundary

1:36,112

0 0.35 0.7 1.4 mi

0 0.5 1 2 km

Esri, HERE, Garmin, Esri, HERE, Maxar

Online web user

This is an unofficial map from the OSE's online application.

Water Right Summary

get image list

WR File Number:	RA 12428	**Subbasin:**	RA	**Cross Reference:**	
Primary Purpose:	STK 72-12-1 LIVESTOCK WATERING				
Primary Status:	PMT Permit				
Total Acres:		**Subfile:**		**Header:**	
Total Diversion:	3.000	**Cause/Case:**			
Owner:	BOGLE LTD.	**Owner Class:**	Owner		
Contact:	STUART BOGLE				

Documents on File

(acre-fe

Transaction Images	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/To	Acres	Diversion
get images	590003	72121	2016-06-29	PMT	LOG	RA 12428 POD1	T		3.000

Current Points of Diversion

POD Number	Well Tag	Source	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map	Other Location Desc
RA 12428		Shallow	SE	NE	NW	21	15S	28E	580579.1	3652317.4		

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

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 Nbr	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map
	RA 12428	SE	NE	NW	21	15S	28E	580579.1	3652317.4	

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

Driller License:	1058	**Driller Company:**	KEY'S DRILLING & PUMP SERVICE		
Driller Name:	DONALD KUEHN III				
Drill Start Date:	2016-07-28	**Drill Finish Date:**	2016-08-04	**Plug Date:**	
Log File Date:	2016-08-08	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	15
Casing Size:	4.50	**Depth Well:**	170	**Depth Water:**	125

Water Bearing Stratifications:

Top	Bottom	Description
125	140	Sandstone/Gravel/Conglomerate
140	160	Sandstone/Gravel/Conglomerate
160	170	Sandstone/Gravel/Conglomerate

Casing Perforations:

Top	Bottom
125	170

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cranbrook State Com 1H
Watercourse 205ft

January 19, 2025

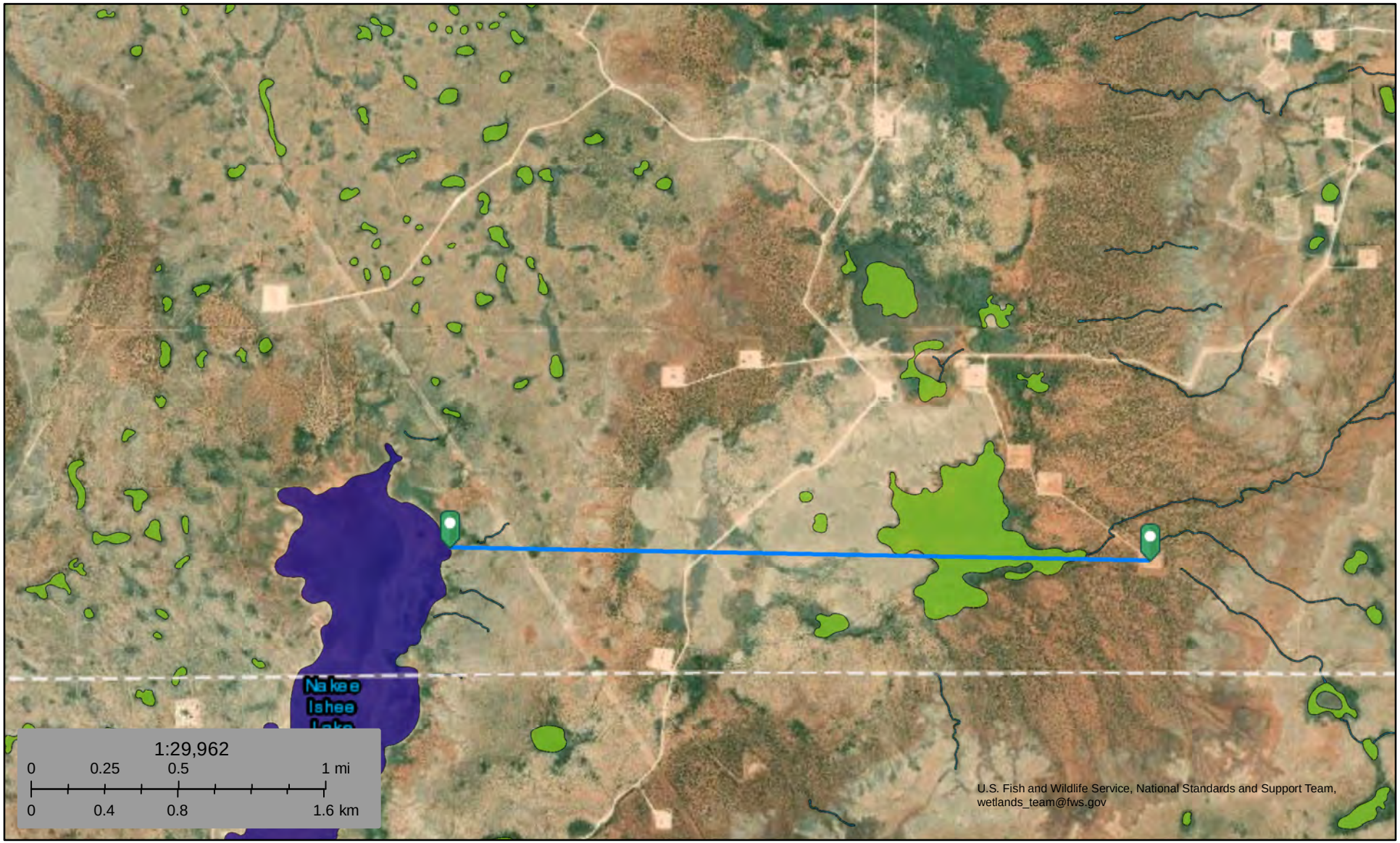
Wetlands

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

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cranbrook State Com 1H Lake 10,545 ft



January 19, 2025

Wetlands

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

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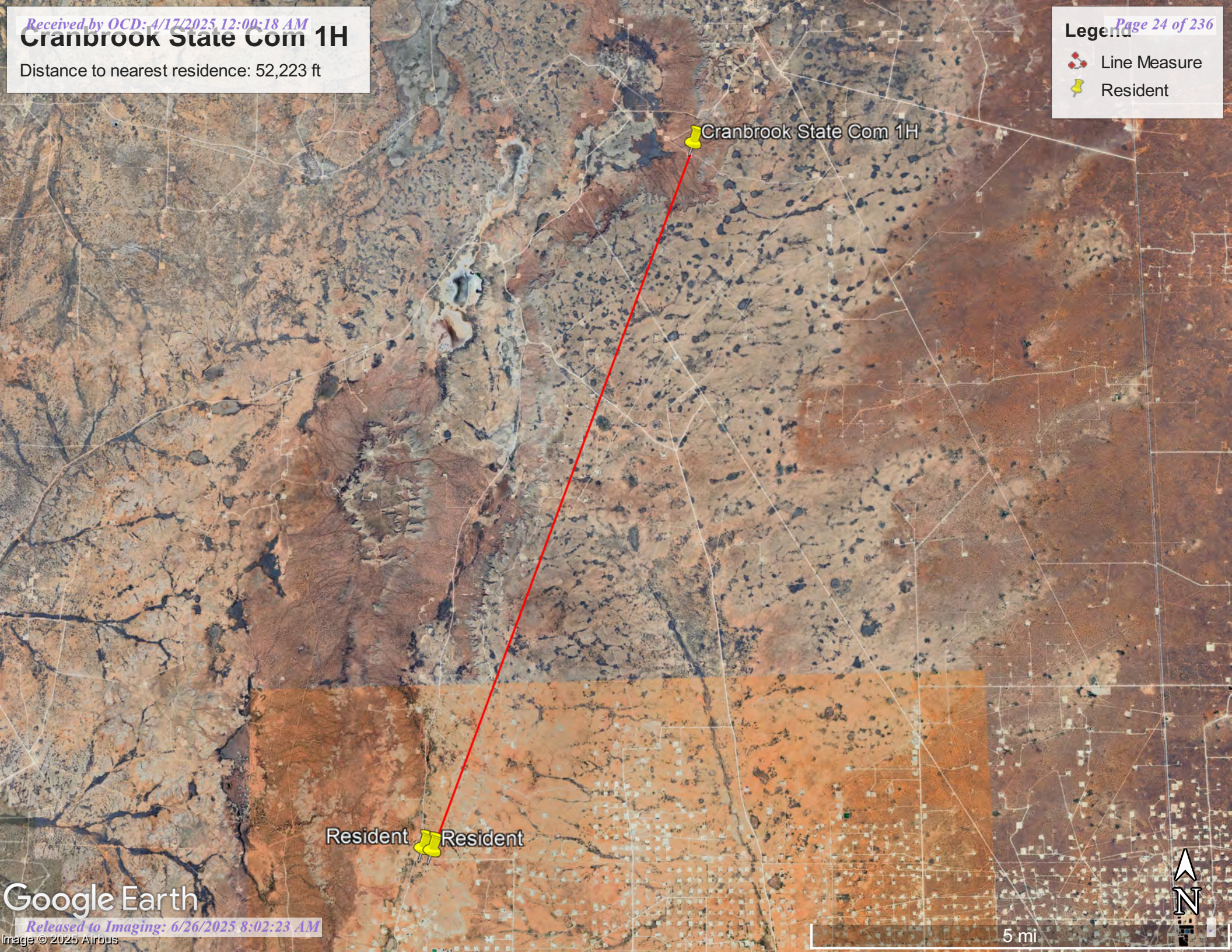
Cranbrook State Com 1H

Distance to nearest residence: 52,223 ft



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) | (meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q64	q16	q4	Sec	Tws	Range	X	Y	Map	Distance
LWD 03198	RA	PLS	4.950	BOGLE FARMS	CH	LWD 03198 POD1								31	15S	29E	587101.0	3648631.0 *		1,545.5
LWD 03197	RA	PLS	4.950	BOGLE FARMS	CH	LWD 03197 POD1								30	15S	29E	587075.0	3650222.0 *		2,412.2
RA 08333	RA	STK	1.470	BOGLE FARMS	CH	RA 08333						NW	NE	26	15S	28E	584050.0	3650815.0 *		2,926.8
LWD 03199	RA	PLS	8.200	BOGLE FARMS	CH	LWD 03199 POD1								32	15S	29E	588712.0	3648646.0 *		3,142.2
RA 12007	RA	EXP	0.000	MACK ENERGY	CH	RA 12007 POD1					SE	NE	SW	19	15S	29E	586999.1	3651508.8		3,484.2
RA 12006	RA	EXP	0.000	MACK ENERGY	CH	RA 12006 POD1					NE	NE	SW	19	15S	29E	587049.3	3651703.3		3,682.5
LWD 03196	RA	PLS	2.770	BOGLE FARMS	CH	LWD 03196 POD1								20	15S	29E	588694.0	3651839.0 *		4,691.9

Record Count: 7

Filters Applied:

UTM Filters (in meters):
Easting: 585586.35
Northing: 3648323.89
Radius: 5000.0

Sorted By: Distance

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cranbrook State Com 1H Wetland 981 ft

January 19, 2025

Wetlands

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

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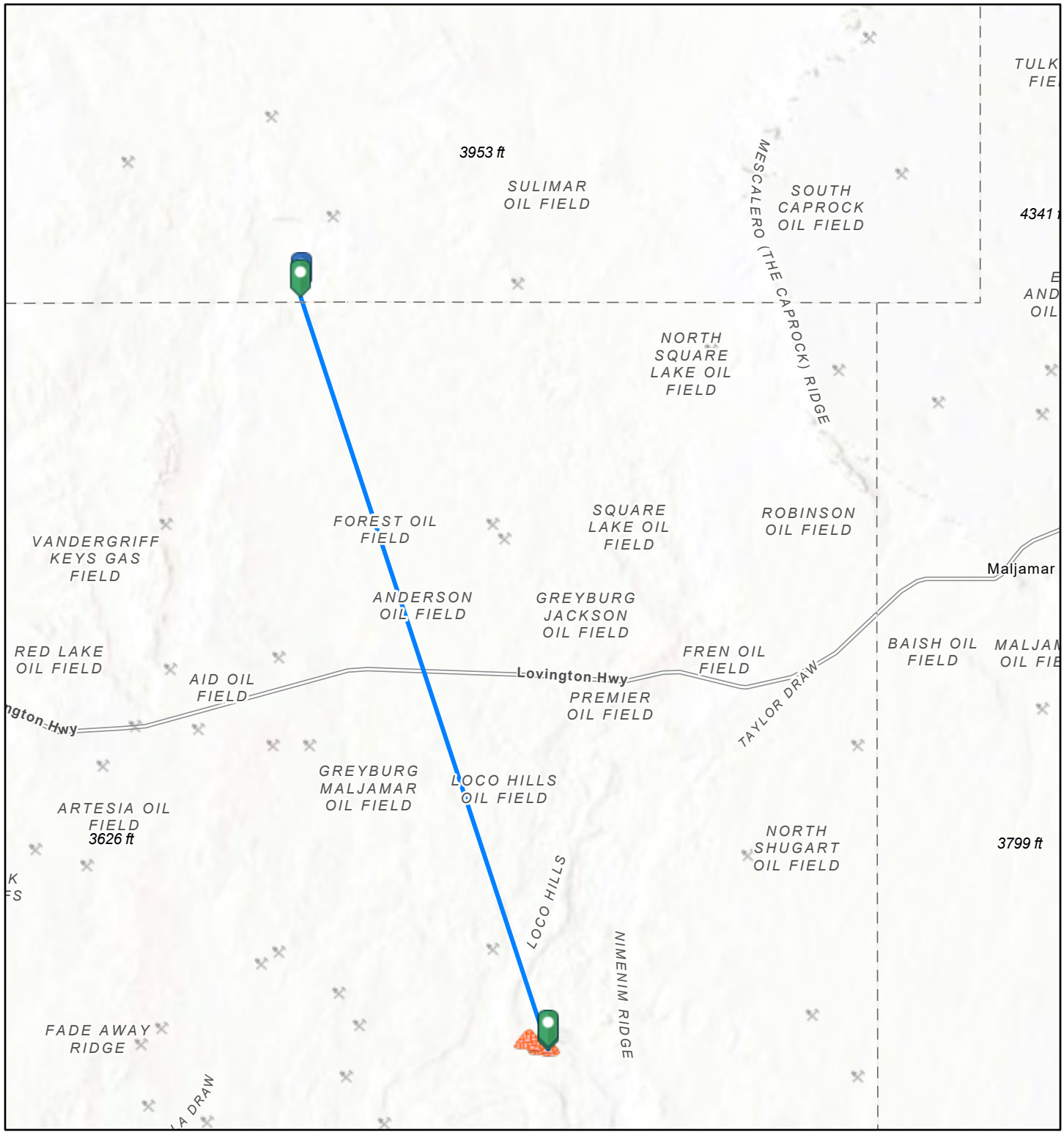
Cranbrook State Com 1H Mine 114,075ft



1/19/2025, 12:42:37 PM

1:288,895

0 2 4 8 mi

0 3.25 6.5 13 km

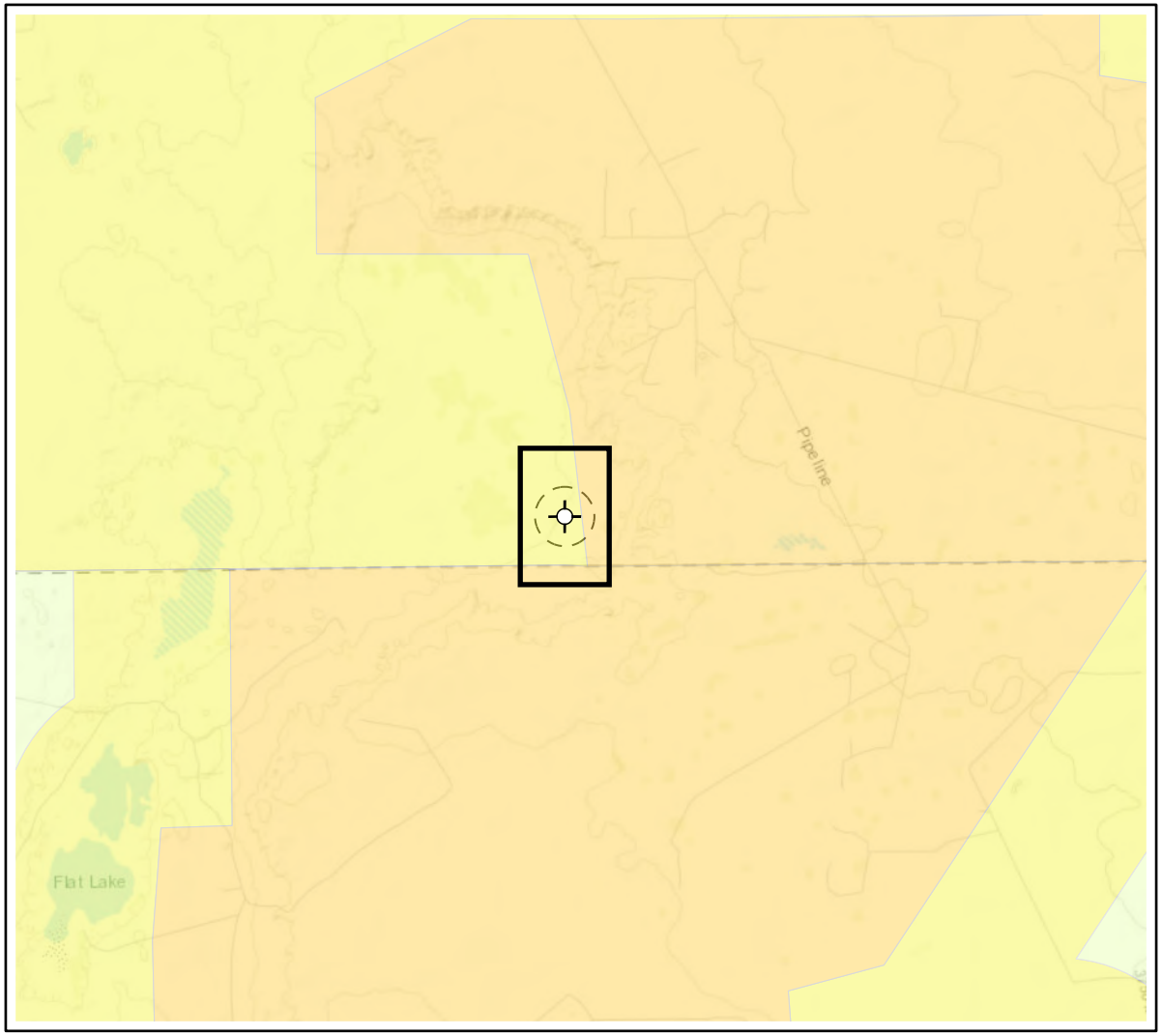
Registered Mines

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

Esri, NASA, NGA, USGS, Texas Parks & Wildlife, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS

EMNRD MMD GIS Coordinator

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



Karst Potential

- Critical
- High
- Medium
- Low

Site Location

Site Buffer (1000 ft.)

Overview Map

0 0.25 0.5 1 mi

Detail Map

0 150 300 600 ft

VERTEX

Map Center:
Lat/Long
32.969914°,-104.08414°

NAD 1983 UTM Zone 13N
Date: Nov 22/24

N

Karst Potential Map
Cranbrook State Com 1H

Figure:
X

MACK Energy Corporation

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.

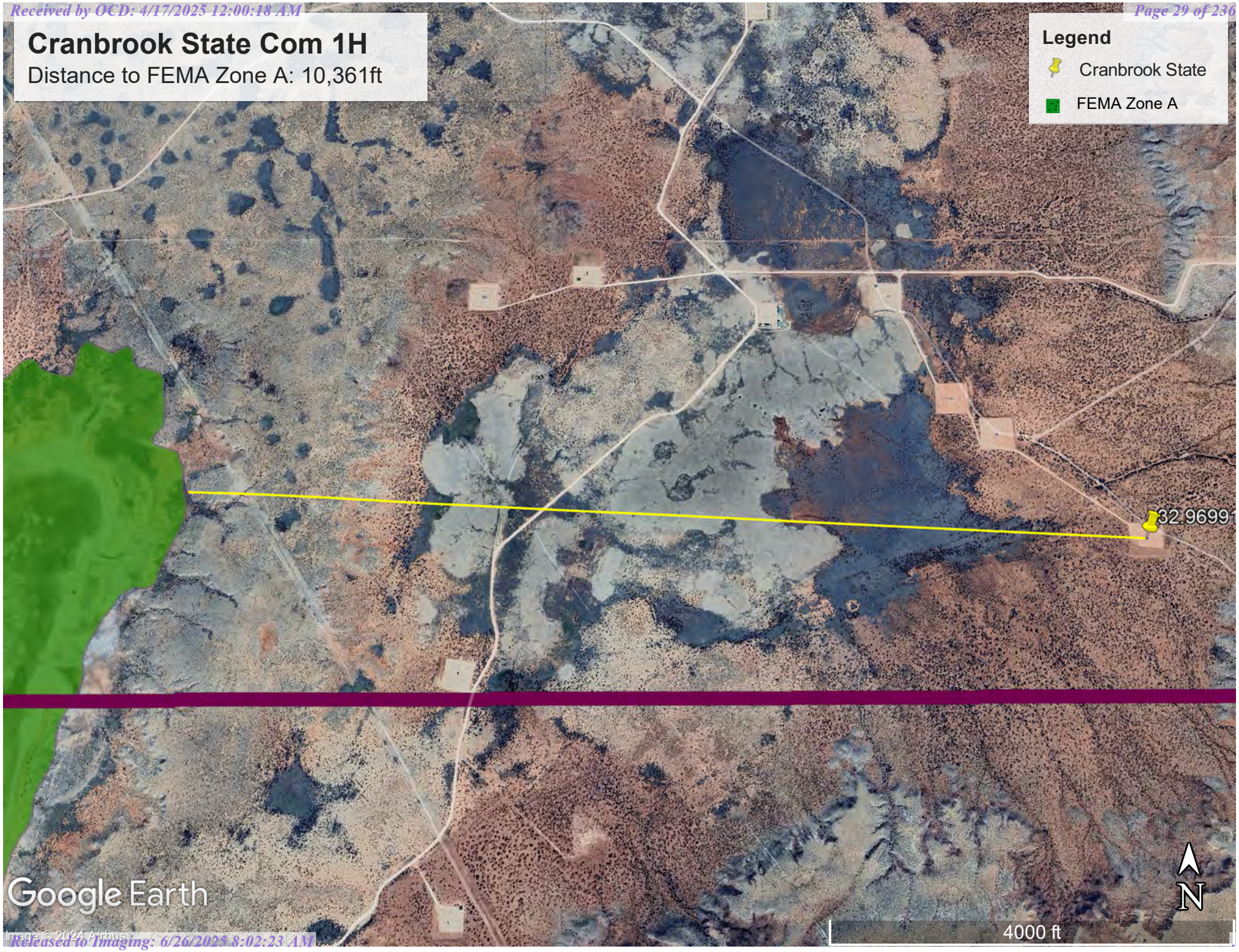
Note: Inset Map, Esri 2022; Overview Map: Esri World Topographic. Karst potential data sources from Roswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management, (2018). Karst Potential.

VERSATILITY. EXPERTISE.

Document Path: S:\04 - Geomatics\1-Projects_US PROJECTS\Mack Energy\2024\24E-04970\Project\24E-04970.aprx

Cranbrook State Com 1H

Distance to FEMA Zone A: 10,361ft



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 Chaves County, New Mexico, Southern Part

November 21, 2024

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.

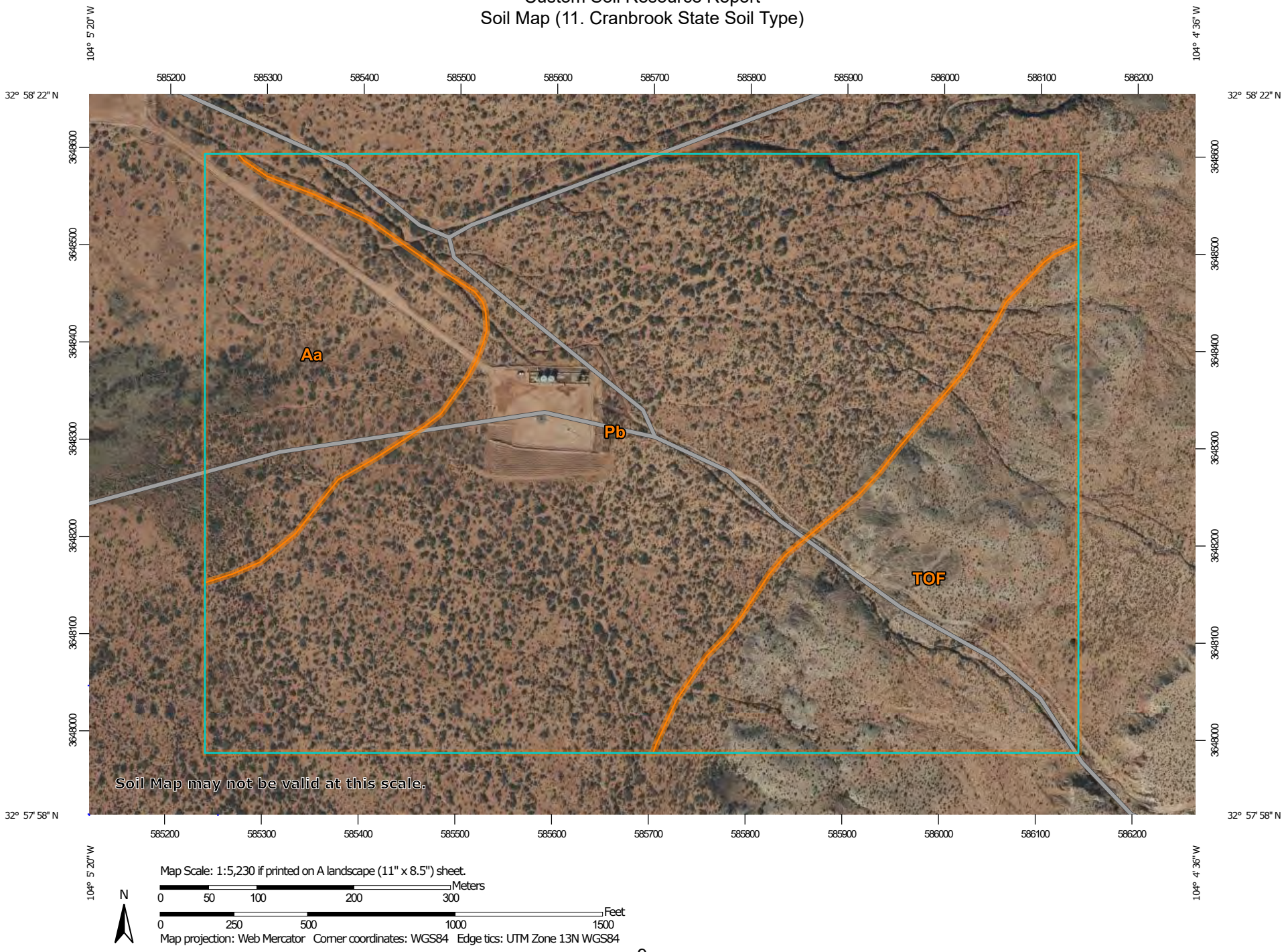
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 (11. Cranbrook State Soil Type)



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 1:24,000.

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: Chaves County, New Mexico, Southern Part
Survey Area Data: Version 19, Sep 3, 2024

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

Date(s) aerial images were photographed: Nov 12, 2022—Dec 2, 2022

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 (11. Cranbrook State Soil Type)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Aa	Alama loam	19.9	14.4%
Pb	Pajarito-Pintura complex	87.3	63.2%
TOF	Torriorthents, very steep	30.9	22.4%
Totals for Area of Interest		**138.1**	**100.0%**

Map Unit Descriptions (11. Cranbrook State Soil Type)

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.

Chaves County, New Mexico, Southern Part

Aa—Alama loam

Map Unit Setting

National map unit symbol: 1w6g
Elevation: 3,200 to 4,200 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 59 to 65 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Alama and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alama

Setting

Landform: Flood plains, swales
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 58 inches: clay loam
H3 - 58 to 69 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Minor Components

Pajarito
Percent of map unit: 5 percent
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Berino
Percent of map unit: 5 percent
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Pintura
Percent of map unit: 4 percent
Ecological site: R070BD005NM - Deep Sand
Hydric soil rating: No

Playa
Percent of map unit: 1 percent
Landform: Flood-plain playas
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R070BC017NM - Bottomland
Hydric soil rating: Yes

Pb—Pajarito-Pintura complex

Map Unit Setting
National map unit symbol: 1w7s
Elevation: 3,300 to 3,900 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 59 to 65 degrees F
Frost-free period: 200 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Pajarito and similar soils: 55 percent
Pintura and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pajarito

Setting
Landform: Plains, terraces, alluvial fans
Landform position (three-dimensional): Side slope, base slope, crest, rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Parent material: Mixed alluvium and/or eolian deposits derived from sedimentary rock

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 46 inches: fine sandy loam
H3 - 46 to 60 inches: fine sandy loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Description of Pintura

Setting

Landform: Dunes
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed eolian deposits derived from sedimentary rock

Typical profile

H1 - 0 to 3 inches: loamy fine sand
H2 - 3 to 38 inches: loamy fine sand
H3 - 38 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R070BD005NM - Deep Sand
Hydric soil rating: No

Minor Components

Alama

Percent of map unit: 5 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Simona

Percent of map unit: 5 percent
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Berino

Percent of map unit: 5 percent
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

TOF—Torriorthents, very steep

Map Unit Setting

National map unit symbol: 1w8d
Elevation: 2,840 to 4,500 feet
Mean annual precipitation: 8 to 13 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Torriorthents: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Torriorthents

Setting

Landform: Escarpments, scarps
Landform position (three-dimensional): Free face
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 6 inches: gravelly loam
H2 - 6 to 20 inches: gravelly sandy clay loam
H3 - 20 to 24 inches: bedrock

Properties and qualities

Slope: 30 to 80 percent
Depth to restrictive feature: 10 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Calcium carbonate, maximum content: 7 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydric soil rating: No

Minor Components

Ima

Percent of map unit: 8 percent
Ecological site: R070BY055NM - Sandy Plains
Hydric soil rating: No

Rock outcrop

Percent of map unit: 7 percent
Hydric soil rating: No

Soil Information for All Uses

Ecological Sites

Individual soil map unit components can be correlated to a particular ecological site. The Ecological Site Assessment section includes ecological site descriptions, plant growth curves, state and transition models, and selected National Plants database information.

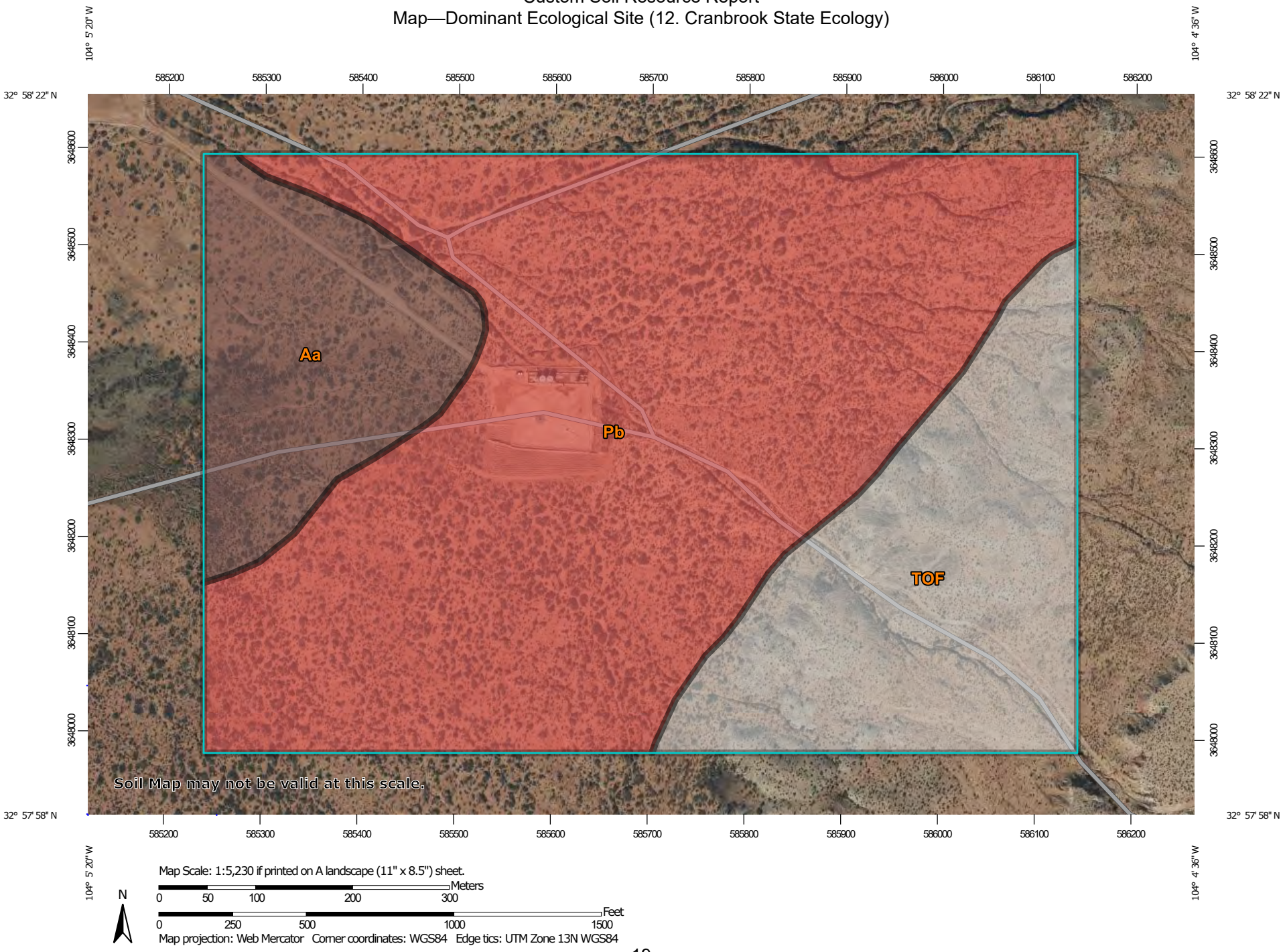
All Ecological Sites — (12. Cranbrook State Ecology)

An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site ID" is the symbol assigned to a particular ecological site.

The map identifies the dominant ecological site for each map unit, aggregated by dominant condition. Other ecological sites may occur within each map unit. Each map unit typically consists of one or more components (soils and/or miscellaneous areas). Each soil component is associated with an ecological site. Miscellaneous areas, such as rock outcrop, sand dunes, and badlands, have little or no soil material and support little or no vegetation and therefore are not linked to an ecological site. The table below the map lists all of the ecological sites for each map unit component in your area of interest.

Custom Soil Resource Report
Map—Dominant Ecological Site (12. Cranbrook State Ecology)



MAP LEGEND

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

Soils

Soil Rating Polygons
- R070BC007NM
- R070BD004NM
- Not rated or not available

Soil Rating Lines
- R070BC007NM
- R070BD004NM
- Not rated or not available

Soil Rating Points
- R070BC007NM
- R070BD004NM
- Not rated or not available

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 1:24,000.

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: Chaves County, New Mexico, Southern Part
Survey Area Data: Version 19, Sep 3, 2024

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

Date(s) aerial images were photographed: Nov 12, 2022—Dec 2, 2022

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.

Table—Ecological Sites by Map Unit Component (12. Cranbrook State Ecology)

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
Aa	Alama loam	Alama (85%)	R070BC007NM — Loamy	19.9	14.4%
		Berino (5%)	R070BD004NM — Sandy		
		Pajarito (5%)	R070BD004NM — Sandy		
		Pintura (4%)	R070BD005NM — Deep Sand		
		Playa (1%)	R070BC017NM — Bottomland		
Pb	Pajarito-Pintura complex	Pajarito (55%)	R070BD004NM — Sandy	87.3	63.2%
		Pintura (30%)	R070BD005NM — Deep Sand		
		Alama (5%)	R070BC007NM — Loamy		
		Berino (5%)	R070BD004NM — Sandy		
		Simona (5%)	R070BD002NM — Shallow Sandy		
TOF	Torriorthents, very steep	Torriorthents (85%)		30.9	22.4%
		Ima (8%)	R070BY055NM — Sandy Plains		
		Rock outcrop (7%)			
Totals for Area of Interest				**138.1**	**100.0%**

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USDA Natural Resources Conservation Service

Ecological site R070BD004NM
Sandy

Accessed: 01/19/2025

General information

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

Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

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

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

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan piedmont (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity short duration thunderstorms.
Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.
The average frost-free season is 207 to 220 days. The last killing frost is in late March or early April, and the first killing frost is in late October or early November.
Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture,

annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest in January through June which rapidly dries out the soil during a critical period for cool season plant growth.

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

Table 3. Representative climatic features

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

Influencing water features

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

Soil features

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

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

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

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

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

Characteristic Soils Are:
Anthony
Berino
Cacique
Harkey
Pajaritio
Reakor
Mobeetie
Wink
Sotim
Vinton
Drake
Onite
Alma
Poquita
Dona Ana
Monahans

Note: *Cacique soils is a shallow soil.

Table 4. Representative soil features

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

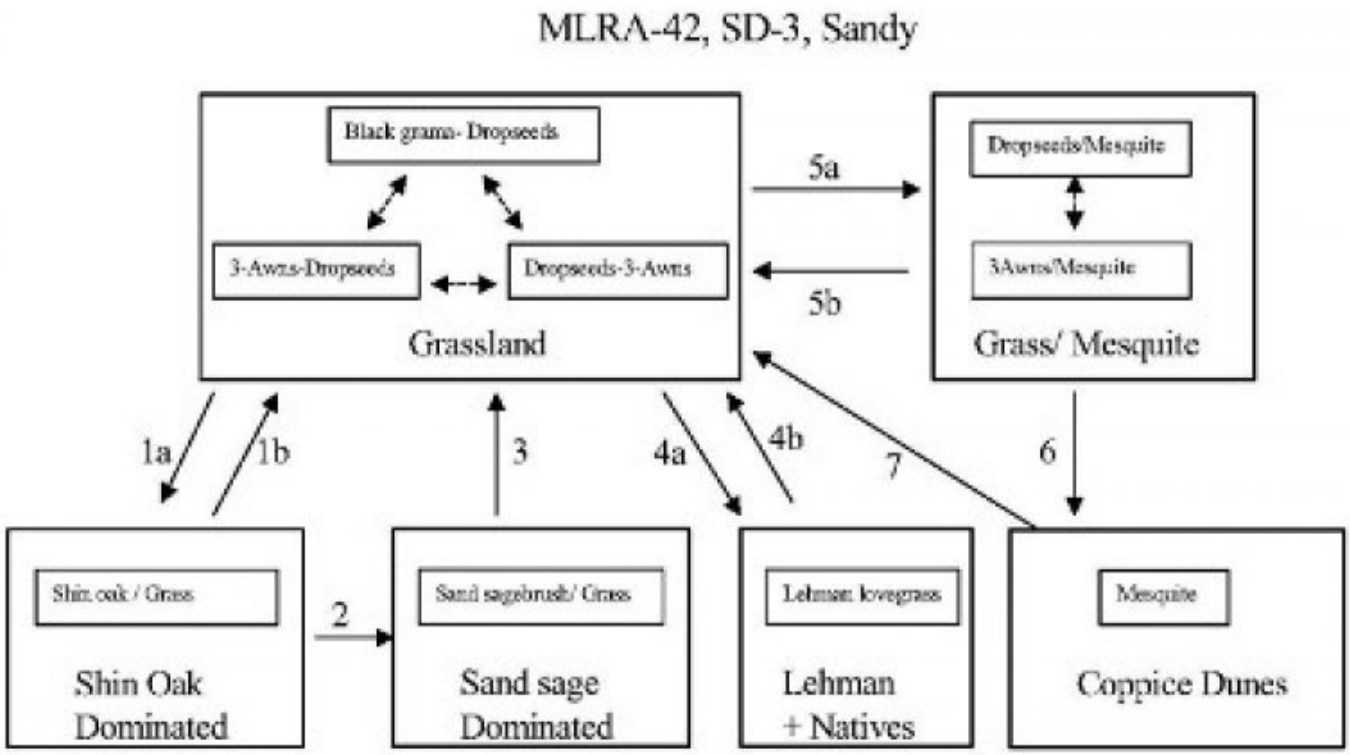
Ecological dynamics

Overview

The Sandy site often intergrades with the Loamy Sand and Deep Sand sites (SD-3). Sandy sites occur on plains, fans, or terraces between drainages. Slopes average less than five percent. Surface textures are usually sandy loams. The historic plant community of the Sandy site is dominated by black grama (*Bouteloua eriopoda*) and dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*). Blue grama (*B. gracilis*) also occurs as a subdominant species. Perennial and annual forb abundance is distributed relative to precipitation occurrence. Litter and to a lesser extent, bare ground, compose a significant proportion of the ground cover while grasses compose the remainder. Decreases in black grama and other grass species' cover indicate a transition to states with an increased shrub component. Shinnery oak (*Quercus havardii*), sand sage(*Artemisia filifolia*), and honey mesquite (*Prosopis glandulosa*) can all increase in composition. Lehmann lovegrass (*Eragrostis lehmanniana*) also may occur as a result of invasion and competition among grass species. Heavy grazing intensity and/or drought are influential in decreasing grass cover and subsequently increasing shrub cover. Fire suppression further supports shrub cover increase and an advantage over grass species. However, brush and grazing management may restore grass species and reverse shrub or grass/shrub dominated states back toward the historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram)



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

2.Brush control (insufficient chemical).

3. Brush control

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

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

6.Severe loss of grass cover, wind erosion.

7. Brush control, seeding

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Grassland: The historic plant community is composed primarily of black grama, dropseeds, and a secondary component of blue grama. Black grama tends to dominate due to the predominance of sandy loam soils; however, dropseeds increase on more loamy soils. Perennial and annual forbs are common but their abundance and

distribution are dependent on seasonal precipitation. Historical fire frequency is unknown but probably contributed to shrub reduction to the competitive advantage of grass species. Excessive grazing and drought are likely the dominant drivers that decrease black grama and increase dropseed and threeawn abundance within the historic plant community. Black grama has low seed viability, and therefore, reproduces vegetatively during the summer growing season. However, black grama growth is delayed one season after normal precipitation. Black grama is dormant for the remainder of the year; however, black grama retains nutritive value yearlong for grazing. In contrast, dropseeds have relatively abundant, viable seed production and can benefit from early spring as well as summer precipitation. Threeawns also respond to spring and summer moisture and tend to be the year's first palatable species. Threeawns and dropseeds, however, are not palatable during dormant periods, which extends grazing pressure to black grama. Moderate to heavy grazing reduces vegetative cover of black grama which increases its susceptibility to wind erosion and drought (Canfield 1939). Black grama is especially vulnerable to grazing during the summer growing season when stoloniferous growth and rooting occur. Black grama sustains short droughts through reduction of plant tufts which will subsequently emerge with sufficient moisture. Prolonged drought or grazing concurrently under drought conditions can delay or impede recovery of black grama (Nelson 1934) and increase abundance of dropseeds, threeawns, and blue grama. Historical fire events may have benefited black grama, especially, frequent, light intensity/severity fires in conjunction with sufficient moisture to increase stolon production (McPherson 1995). Fires which were hot and severe, however, probably contributed to black grama mortality, more so in drought conditions. Diagnosis: This state is a grassland dominated by black grama, dropseeds, and threeawns, with subdominant blue grama. Shrubs, such as sand sage and mesquite, are sparsely dispersed throughout the grassland. Forb populations are present and fluctuate with precipitation variability. Other grasses that could appear on this site include: fall withchgrass, slim tridens, Almejita signalgrass, Indian ricegrass and fluffgrass. Other shrubs include: pale wolfberry, lotebush, tarbush, Apacheplume, and mesquite. Other forbs include: plains tickseed, plains blackfoot, scorpionweed, nama, wooly guara, wooly dalea, spectaclepod mustard, bladderpod mustard, menodora, prickly lettuce, lambsquarter, wooly Indianwheat and wild buckwheat.

Table 5. Annual production by plant type

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

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	35-40%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	35-45%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	15-20%

Figure 7. Plant community growth curve (percent production by month). NM2804, R042XC004NM-Sandy-HCPC. SD-3 Sandy - Warm season plant community .

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

State 2
Shinnery Oak Dominated

Community 2.1
Shinnery Oak Dominated

Shinnery Oak Dominated: This state is dominated by Shinnery oak with subdominant grass species from the historic plant community. Bare ground is a significant component in this state. Shinnery oak tends to be clumped in distribution in finer soil textures. Shinnery oak density increases (as well as dropseeds, threeawns, and blue grama) in coarse textured (e.g., Loamy Sand sites) and deeper, coarse textured (e.g., Deep Sand and Sandhills sites) soils. Shinnery oak predominates during periods of above average (i.e., 16 in.) precipitation during the months of July and August. Abundance and distribution also increases with disturbance, such as excessive grazing and fire, due to an aggressive rhizome system. Shinnery oak's extensive root system allows competitive exclusion of grasses and forbs. Brush control with herbicide treatments applied in the spring can reduce Shinnery oak (Herbel et al. 1979, Pettit 1986). In addition, repetitive seasons of goat browsing can also decrease Shinnery oak abundance. However, brush management should maintain shrub patches to prevent erosion and to provide wildlife cover and forage. Diagnosis: This state represents a clumped distribution of Shinnery oak with patches of bare ground and subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Shinnery oak density increases, as do dropseeds, threeawns, and blue grama, as Sandy site intergrades with Deep Sand and Sandhills sites. Transition to Shinnery Oak-Dominated State (1a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Shinnery oak as a result of drought, above average precipitation (>16 inches), grazing, fire suppression, interspecific competition, and coarse textured soils. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Increase of dropseed/threeawn and shinnery oak • Surface soil erosion and bare patch expansion Transition to Historic Plant Community (1b): The Shinnery oak-dominated state begins to transition toward the historic plant community as drivers such as drought, but also above average precipitation (e.g., 16 inches) discontinue. Brush control can also drive the Shinnery oak state toward a grassland state.

State 3
Sand Sage Dominated

Community 3.1
Sand Sage Dominated

Sand Sage Dominated: This state is dominated by sand sage with subdominant grass species from the historic plant community. Sand sage occurs as a result of insufficient herbicide application in Shinnery oak dominated sites with subdominant sand sage. Sand sage either reestablishes dominance or colonizes from an off-site location and stabilizes soils. Sand sage stabilizes light sandy soils from wind erosion and provides a harbor for grass and forb species in heavily grazed conditions (Davis and Bonham 1979). Sand sage abundance increases with drought and/or heavy grazing, but decreases with light grazing due to herbaceous plant competition. Grass and forb species can reestablish as competition from sand sage is relatively light. Herbicide applied in the spring, especially when growth and photosynthesis rates are greatest, can reduce sand sage if there is subsequent rest from grazing (Herbel et al. 1979, Pettit 1986). Brush management should maintain patches of sand sage to prevent wind erosion and subsequent dune formation. Diagnosis: This state is dominated by sand sage with subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Sand sage tends to occur in sites with coarser textured soils. Transition to Sand Sage Dominated (2): Sand sage appears from off-site locations and/or increases after insufficient herbicide applications aimed at removing Shinnery oak and sand sage. Key indicators of approach to transition: • Increase of sand sage seedlings and grasses • Reduced soil erosion Transition to Historic Plant Community (3): The sand sage dominated state transitions toward the historic plant community as sand sage decreases primarily through brush management but also with light intensity grazing management. Drought reduction will also support a transition to the historic plant community.

State 4
Lehmann Lovegrass + Natives

Community 4.1
Lehmann Lovegrass + Natives

Lehmann Lovegrass + Natives: This state is dominated by Lehmann lovegrass with subdominant grass species from the historic plant community. Lehmann lovegrass is a warm-season, perennial bunchgrass that was introduced from South Africa in the 1930's for rangeland restoration purposes (Humphrey 1970). Lehmann lovegrass invades from off-site locations with projects utilizing lovegrass for reseeding, soil stabilization, or highway projects. Lehmann lovegrass provides a winter and early spring forage for grazing. Lehmann lovegrass is vigorous in sandy to sandy loam soils which receive approximately 6-8 inches of summer precipitation (Cox et al. 1988). Lehmann lovegrass's aggressive competitive exclusion of native grass species has been attributed to lovegrass's low summer palatability, which reduces vigor of native species and allows lovegrass to increase vigor before grazing. Also, Lehmann lovegrass abundant seed production and establishment, especially after disturbances, allows for increased competition (Cable 1971, Cox et al. 1981). Lehmann lovegrass generally is tolerant to fire because of an aggressive seed-bank; however, severe fires can cause mature lovegrass mortality (Sumrall et al. 1991). Herbicide and reseeding is recommended for control of Lehmann lovegrass (Winn 1991). Diagnosis: Lehmann lovegrass and grass species from the historic plant community, such as black grama, dropseeds, threeawns, and blue grama, dominate this state. Transition to Lehmann lovegrass and native grass species (4a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Lehmann lovegrass as a result of drought, grazing, fire and interspecific competition from nearby sources of Lehmann lovegrass. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Disturbance and nearby source of Lehmann lovegrass • Increase of Lehmann lovegrass seedlings Transition to Historic Plant Community (4b): The Lehmann lovegrass/native grass state transitions toward the historic plant community after actions such as herbicide application and native reseeding have occurred. In addition, prevention of disturbances such as fire and livestock grazing also will encourage the transition to a native grass community

State 5
Grass/Mesquite

Community 5.1
Grass/Mesquite

Grass/Mesquite: This state is dominated by honey mesquite with dropseeds and/or threeawns. Black grama generally is rare as a result of heavy grazing intensity. Honey mesquite invades through seed dispersal from grazing livestock and/or wildlife. Dropseeds and threeawns cohabitate with mesquite due to sufficient precipitation. Mesquite tends to be arborescent due to less soil erosion relative to the Coppice Dunes state which reflects large soil loss. Mesquite obtains approximately half of its nitrogen from symbiotic bacteria housed in root nodules (Lajtha and Schlesinger 1986). Mesquite also provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Historical fire occurrences reduced mesquite abundance by disrupting seed production cycles and suppressing seedlings; thus, grass species remained dominant. However, fire suppression has allowed mesquite to increase in density and abundance, increasing mesquite resistance to fires through aggressive resprouting. Herbicide application combined with subsequent prescribed fire may be effective in mesquite reduction (Britton and Wright 1971). Diagnosis: This state is co-dominated by honey mesquite and dropseeds or threeawns. Transition to Grass/Mesquite State (5a): This state occurs due to a decrease in black grama primarily from heavy grazing intensity and from an introduction of mesquite seeds from grazers. Dropseeds and threeawns increase and co-exist in the absence of black grama. Fire suppression also is responsible for an increase in mesquite. Key indicators of approach to transition: • Loss of black grama • Increase of dropseeds and/or threeawns • Increase of mesquite seedlings Transition to Historic Plant Community (5b): Transition to the historic plant community requires brush management though herbicide application and possibly prescribed fire to reduce mesquite abundance. Once shrub species are removed, prescribed fire may be useful in maintaining a dominant grassland. Precipitation is also necessary in conjunction with management activities to support a dominant grassland.

State 6

Coppice Dunes

Community 6.1
Coppice Dunes

Coppice Dunes: This state is dominated by coppice mesquite dunes with minimal or no grass cover. Honey mesquite occurs in a multi-stemmed growth form which cultivates it's dune formation by entrapping drifting sands. Mesquite utilizes its extensive tap and lateral roots to benefit from moisture deep in coarse textured soils. Grass species cannot compete for moisture, especially with compounding perturbations such as heavy grazing and drought. Soils succumb to wind erosion with the depletion of grass cover and eventually dunes form around mesquite plants (Gould 1982). Brush management is limited to herbicide application, biological control, or manual removal, as a lack of grass cover prevents prescribed burning. Seeding subsequent to brush control may transition this State toward the historic plant community. Diagnosis: This state is characterized by low growing, multi-stemmed mesquite plants which form Coppice dunes by drifting soils from wind erosion. As grass cover decreases, windblown soils are removed from unprotected, inter-dune areas. Soils are then re-deposited on dunes which increases dune size. Transition to Mesquite Coppice Dunes State (6): Decrease in black grama with subsequent decrease in dropseeds and threeawns due to competition with mesquite especially during drought, heavy grazing, and fire suppression. Competitive exclusion of grasses leads to wind erosion of sandy soils and dune formation of low growing mesquite plants. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Wind erosion as evidenced by pedestalled plants • Bare patch expansion • Increase of Coppice dune mesquites Transition to Historic Plant Community (7): Transition toward the historic plant community requires mesquite removal though either herbicide application, biological control, or manual removal. In addition, seeding of native grass species with subsequent years of sufficient moisture is critical.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			315–360	
	black grama	BOER4	*Bouteloua eriopoda*	315–360	–
2	**Warm Season**			45–90	
	blue grama	BOGR2	*Bouteloua gracilis*	45–90	–
3	**Warm Season**			27–45	
	bush muhly	MUPO2	*Muhlenbergia porteri*	27–45	–
4	**Warm Season**			90–135	
	spike dropseed	SPCO4	*Sporobolus contractus*	90–135	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	90–135	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	90–135	–
5	**Warm Season**			27–45	
	threeawn	ARIST	*Aristida*	27–45	–
6	**Warm Season**			27–45	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	27–45	–
7	**Warm Season**			27–45	
	Arizona cottontop	DICA8	*Digitaria californica*	27–45	–
8	**Warm Season**			45–72	
	silver bluestem	BOSA	*Bothriochloa saccharoides*	45–72	–
	little bluestem	SCSC	*Schizachyrium scoparium*	45–72	–
9	**Warm Season**			9–27	
	vine mesquite	PAOB	*Panicum obtusum*	9–27	–

10	**Warm Season**			9–27	
	tobosagrass	PLMU3	*Pleuraphis mutica*	9–27	–
11	**Other Perennial Grasses**			9–27	
	Grass, perennial	2GP	*Grass, perennial*	9–27	–
Shrub/Vine					
12	**Shrub**			9–45	
	yucca	YUCCA	*Yucca*	9–45	–
13	**Shrub**			9–27	
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	9–27	–
14	**Shrub**			9–27	
	fourwing saltbush	ATCA2	*Atriplex canescens*	9–27	–
15	**Shrub**			9–27	
	jointfir	EPHED	*Ephedra*	9–27	–
16	**Shrub**			9–27	
	javelina bush	COER5	*Condalia ericoides*	9–27	–
17	**Shrub**			9–27	
	sand sagebrush	ARFI2	*Artemisia filifolia*	9–27	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	9–27	–
18	**Other Shrubs**			9–27	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	9–27	–
Forb					
19	**Forb**			27–63	
	croton	CROTO	*Croton*	27–63	–
	globemallow	SPHAE	*Sphaeralcea*	27–63	–
20	**Forb**			27–45	
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	27–45	–
	woolly groundsel	PACA15	*Packera cana*	27–45	–
21	**Forb**			9–27	
	Adonis blazingstar	MEMU3	*Mentzelia multiflora*	9–27	–
22	**Forb**			27–45	
	redstem stork's bill	ERCI6	*Erodium cicutarium*	27–45	–
	Texas stork's bill	ERTE13	*Erodium texanum*	27–45	–
23	**Other Forbs**			9–27	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	9–27	–

Animal community

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

Hydrological functions

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

Soil Series Hydrologic Group
Anthony B
Berino B
Cacique C *shallow soil
Harkey B
Pajaritio B
Reakor B
Mobeetie B
Wink B
Sotim B
Vinton B
Drake B
Onite B
Alma B
Poquita B
Dona Ana B
Monahans B

Recreational uses

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

Wood products

This site has no potential for wood products.

Other products

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

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

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

Inventory data references

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

Other references

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

Literature Cited

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

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

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

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

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

Contributors

Don Sylvester
Quinn Hodgson

Rangeland health reference sheet

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

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

Indicators

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

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

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

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

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

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

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

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

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

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

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

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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

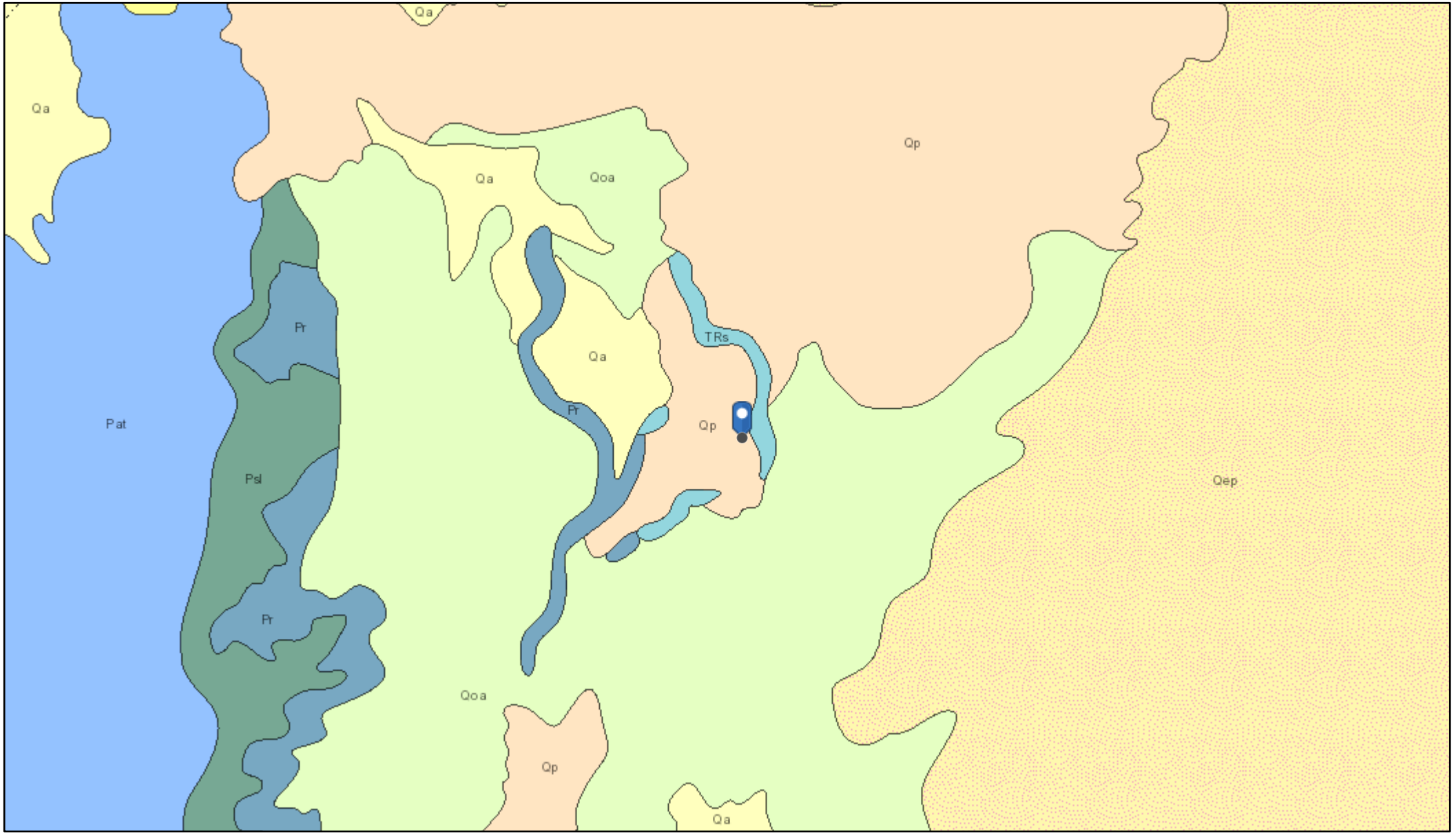
14. **Average percent litter cover (%) and depth (in):**

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

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

17. **Perennial plant reproductive capability:**

Cranbrook State Com 1H Geology



11/21/2024, 10:51:44 AM

Lithologic Units

- Playa——Alluvium and evaporite deposits (Holocene)
- Water——Perenial standing water
- Qa——Alluvium (Holocene to upper Pleistocene)

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

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

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 Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

APPENDIX B – Daily Field Report(s)

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	11/25/2024
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	11/26/2024 12:32 AM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	11/25/2024 10:10 AM
Departed Site	11/25/2024 3:40 PM

Daily Site Visit Report

Site Sketch

Site Sketch

Daily Site Visit Report

Field Notes

10:49 Arrived on site, signed JSA's.
Secondary sweep.
Working on characterization.

15:18 Field Screening: Chlorides have been coming back high on the surface level for all samples. Except for BH24-02, which met criteria. TPH has been coming back low on the surface level for all samples.

15:16 Pad is not yet registered on 811 because it is a fairly new pad. Matt Buckles contacted us to inform us of an underground electric line that has not been marked yet. We tried to locate the line with the magnetic locator but we were not able to pick up the location of the electrical line.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: North	**Viewing Direction**: North
	
Sample area, BH 24–01 @ surface level.	Sample area BH 24–02 @ surface level.
Viewing Direction: North	**Viewing Direction**: North
	
Sample area BH24–03 at the surface level.	Sample area BH 24–04 @ surface level.

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: North
	
Sample area BH 24–05 @ surface level.	Sample area BH 24–06 @ surface level.
Viewing Direction: North	**Viewing Direction**: North
	
Sample area BH 24–07 at surface level.	Sample area BH 24–08 at surface level.

Daily Site Visit Report

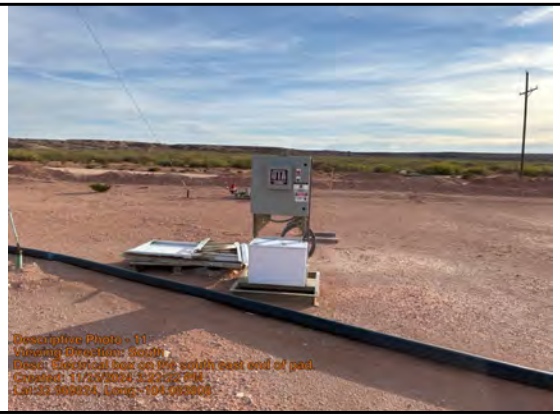
Viewing Direction: North

Sample area BH 24–09 at surface level.

Viewing Direction: South

Electrical box in the middle of the pad connected to green wire going underground at unknown location.

Viewing Direction: South



Electrical box on the south east end of pad.

Viewing Direction: North

Electrical box next to the CTB's.

Daily Site Visit Report

Viewing Direction: West

Electrical box on the west end of pad.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Meghan Veliz

Signature:

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	11/20/2024
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	11/20/2024 11:12 PM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	11/20/2024 12:25 PM
Departed Site	11/20/2024 1:45 PM

Daily Site Visit Report

Site Sketch

Site Sketch

Daily Site Visit Report

Field Notes

13:31 Loaded project into crinkle

13:31 Evaluated the location of the spill on pad

13:31 Set stakes in the corners of the pad for the 811

Next Steps & Recommendations

1 Send in 811 later

Daily Site Visit Report

Site Photos

Viewing Direction: Southeast

Stake in the Northwest corner of the pad

Viewing Direction: Northeast

Stake in south west corner of pad next to the telephone poll

Viewing Direction: Northwest

Stake in the southeast Corner of the pad

Viewing Direction: Southeast

Stake in the northeast Corner of pad

Daily Site Visit Report

Viewing Direction: East	**Viewing Direction**: Northeast
	
Spoil pile from Mac energy's scrape	The release is not as apparent on the surface after scrape. (Release point circled in blue)

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Katrina Taylor

Signature: 
Signature

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	12/11/2024
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	1/2/2025 7:25 PM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	12/11/2024 9:15 AM
Departed Site	

Field Notes

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West

BH24-15, a step out of BH24-06, hit refusal at 2ft

Viewing Direction: East

BH24-12, sample depths 2 and 4 were collected

Viewing Direction: South

BH24-10, hit refusal at 2ft

Viewing Direction: North

BH24-08, a 2ft taken. Hit refusal at 2ft

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: North
	
Equipment added in the north central area of the release	BH24-09, .5, 1, and 2 ft taken

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Katrina Taylor

Signature:

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	12/3/2024
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	12/3/2024 11:29 PM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	12/3/2024 9:00 AM
Departed Site	12/3/2024 4:27 PM

Field Notes

9:12 Completed safety paper work upon arrival

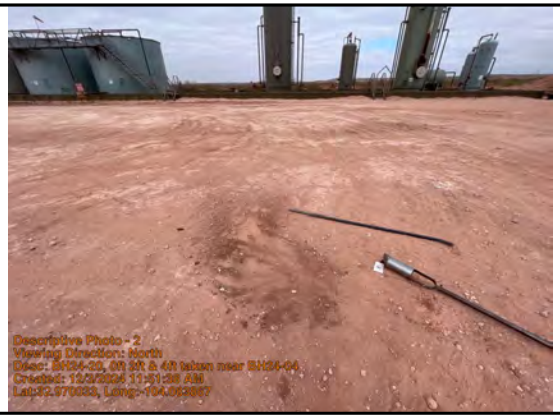
16:26 Resampled 3, 4, and 5 stepped approximately 2ft away address concerns of sampling super fiscal operational contamination

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: North	**Viewing Direction**: North
	
BH24-03, 0ft 2ft & 4ft taken	BH24-04, 0ft 2ft & 4ft taken
Viewing Direction: West	**Viewing Direction**: West
	
BH24-05, 0ft retaken of BH24-05	Site overview from the west

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Katrina Taylor

Signature: 

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	1/8/2025
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	1/8/2025 11:32 PM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	1/8/2025 8:45 AM
Departed Site	1/8/2025 2:45 PM

Field Notes

10:30 Completed safety paper work upon arrival

10:30 Worked with Chet to mark the lines

10:31 Marked out the .5ft excavation area

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: Northeast

Excavation area marked with white spray paint

Viewing Direction: North

Progress with the backhoe after an hour of excavation

Viewing Direction: Southeast

excavation labeled as a drop and 4 flags added towards the edge to notify drivers

Viewing Direction: North

Excavation when the tech left

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Katrina Taylor

Signature: 

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	1/14/2025
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	1/15/2025 2:26 AM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	1/14/2025 8:00 AM
Departed Site	1/14/2025 4:00 PM

Field Notes

15:20 Arrived on site and completed safety paperwork upon arrival. Held safety brief with Alex from bullseye, who is the only other person on site working. Chet from bullseye stopped briefly to check in on progress.

15:21 Collected samples BS24-05 through BS24-15, WS24-04 and WS24-05. All samples were screened for chlorides using silver nitrate titration and TPH with a Dexsil Petroflag system.

15:23 In total, 17 samples was collected and jarred to be sent to the lab for further analysis.

15:23 The excavation is approximately three-quarters complete.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West

West end of the 0.5ft bgs excavation. Location of BS25-01,BS25-02, and WS25-04.

Viewing Direction: East

West end of the excavation viewing east.

Viewing Direction: South

Southern wall of the 0.5ft bgs excavation. Location of WS24-03.

Viewing Direction: East

O.5ft bgs excavation.

Daily Site Visit Report

Viewing Direction: South

1ft bgs excavation.

Viewing Direction: West

East end of the excavation viewing west.

Viewing Direction: West

Soil pile at the end of the day.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: John Rewis

Signature: 

Daily Site Visit Report

Client:	Mack Energy Corporation	Inspection Date:	1/15/2025
Site Location Name:	Cranbrook State Com 1H	Report Run Date:	1/16/2025 2:44 AM
Client Contact Name:	Matt Buckles	API #:	30-005-64360
Client Contact Phone #:	575-748-1288		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	1/15/2025 7:30 AM
Departed Site	1/15/2025 4:30 PM

Field Notes

18:14 Arrived on site and completed safety paperwork upon arrival. Held a safety brief with Justin from Bullseye before work began for the day. On site to continue the ongoing excavation.

18:15 Collected BS25-16 through BS24-32 at 0.5ft bgs. All samples were field screened for chlorides using silver nitrate titration and TPH using a Dexsil Petroflag. All samples met NMOCD strictest criteria.

18:21 In total 21 composite samples were collected and jarred to be sent to the laboratory for further analysis.

18:23 The excavation has been completed has been completed.

18:31 No truckloads of contaminated soil was hauled off site today.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: East

East end of the 0.5ft bgs excavation.

Viewing Direction: East

East end of the 0.5ft bgs excavation. Location of samples BS25-25 through BS25-32, WS25-02 and WS25-03.

Viewing Direction: West

Overview of the excavation from the east end.

Viewing Direction: South

East end of the 0.5ft bgs excavation.

Daily Site Visit Report

Viewing Direction: Northwest

East end of the 0.5ft bgs excavation.

Viewing Direction: North

Middle portion of the excavation.

Viewing Direction: Northwest

Western portion of the 0.5ft bgs excavation.

Viewing Direction: East

Overview of the excavation from the west end.

Daily Site Visit Report

Viewing Direction: Southeast

Western portion of the excavation.

Viewing Direction: Southeast

1ft bgs excavation.

Viewing Direction: West

Soil pile.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: John Rewis

Signature:

APPENDIX C – Laboratory Data Report(s) and Chain of Custody Form(s)

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Sally Carttar
Vertex
3101 Boyd Dr
Carlsbad, New Mexico 88220

Generated 12/12/2024 11:03:40 AM

JOB DESCRIPTION

Cranbrook State Com 1H

JOB NUMBER

885-16239-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

See page two for job notes and contact information.

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization

Generated
12/12/2024 11:03:40 AM

Authorized for release by
Cheyenne Cason, Project Manager
cheyenne.cason@et.eurofinsus.com
(505)345-3975

Client: Vertex
Project/Site: Cranbrook State Com 1H

Laboratory Job ID: 885-16239-1

Table of Contents

Definitions/Glossary

Client: Vertex Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Vertex Job ID: 885-16239-1
Project: Cranbrook State Com 1H

Job ID: 885-16239-1 Eurofins Albuquerque

Job Narrative
885-16239-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 12/4/2024 7:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.5°C.

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015D_DRO: The method blank for preparation batch 885-17106 and analytical batch 885-17090 contained Diesel Range Organics [C10-C28] above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-02 0'
Lab Sample ID: 885-16239-1
Date Collected: 11/25/24 12:00
Matrix: Solid
Date Received: 12/04/24 07:50

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		12/05/24 11:26	12/06/24 18:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*81*		*35 - 166*	*12/05/24 11:26*	*12/06/24 18:07*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		12/05/24 11:26	12/06/24 18:07	1
Ethylbenzene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 18:07	1
Toluene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 18:07	1
Xylenes, Total	ND		0.10		mg/Kg		12/05/24 11:26	12/06/24 18:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*48 - 145*	*12/05/24 11:26*	*12/06/24 18:07*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.5		mg/Kg		12/05/24 11:58	12/05/24 13:38	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		12/05/24 11:58	12/05/24 13:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*100*		*62 - 134*	*12/05/24 11:58*	*12/05/24 13:38*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**260**		60		mg/Kg		12/04/24 14:37	12/05/24 13:41	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16239-1

Client Sample ID: BH24-06 0'

Date Collected: 11/25/24 13:05
Date Received: 12/04/24 07:50

Lab Sample ID: 885-16239-2

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		12/05/24 11:26	12/06/24 19:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*84*		*35 - 166*	*12/05/24 11:26*	*12/06/24 19:12*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		12/05/24 11:26	12/06/24 19:12	1
Ethylbenzene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 19:12	1
Toluene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 19:12	1
Xylenes, Total	ND		0.099		mg/Kg		12/05/24 11:26	12/06/24 19:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*12/05/24 11:26*	*12/06/24 19:12*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**17**		9.3		mg/Kg		12/05/24 11:58	12/05/24 13:50	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		12/05/24 11:58	12/05/24 13:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*98*		*62 - 134*	*12/05/24 11:58*	*12/05/24 13:50*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1600**		60		mg/Kg		12/04/24 12:59	12/04/24 21:01	20

Client Sample Results

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-10 0'
Lab Sample ID: 885-16239-3
Date Collected: 11/26/24 08:00
Matrix: Solid
Date Received: 12/04/24 07:50

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		12/05/24 11:26	12/06/24 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*82*		*35 - 166*	*12/05/24 11:26*	*12/06/24 20:18*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		12/05/24 11:26	12/06/24 20:18	1
Ethylbenzene	ND		0.048		mg/Kg		12/05/24 11:26	12/06/24 20:18	1
Toluene	ND		0.048		mg/Kg		12/05/24 11:26	12/06/24 20:18	1
Xylenes, Total	ND		0.095		mg/Kg		12/05/24 11:26	12/06/24 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*12/05/24 11:26*	*12/06/24 20:18*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**11**		9.6		mg/Kg		12/05/24 11:58	12/05/24 14:02	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		12/05/24 11:58	12/05/24 14:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*98*		*62 - 134*	*12/05/24 11:58*	*12/05/24 14:02*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		60		mg/Kg		12/04/24 12:59	12/04/24 21:12	20

Client Sample Results

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-08 0'
Lab Sample ID: 885-16239-4
Date Collected: 11/25/24 14:00
Matrix: Solid
Date Received: 12/04/24 07:50

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		12/05/24 11:26	12/06/24 20:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*82*		*35 - 166*	*12/05/24 11:26*	*12/06/24 20:39*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		12/05/24 11:26	12/06/24 20:39	1
Ethylbenzene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 20:39	1
Toluene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 20:39	1
Xylenes, Total	ND		0.099		mg/Kg		12/05/24 11:26	12/06/24 20:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*12/05/24 11:26*	*12/06/24 20:39*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		12/05/24 11:58	12/05/24 14:14	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		12/05/24 11:58	12/05/24 14:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*100*		*62 - 134*	*12/05/24 11:58*	*12/05/24 14:14*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**420**		60		mg/Kg		12/04/24 15:09	12/04/24 21:23	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16239-1

Method: 8015M/D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 885-17098/1-A
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17098

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		12/05/24 11:26	12/06/24 17:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*35 - 166*	*12/05/24 11:26*	*12/06/24 17:45*	*1*

Lab Sample ID: LCS 885-17098/2-A
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17098

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]			25.0	19.9		mg/Kg		80	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*170*		*35 - 166*

Lab Sample ID: 885-16239-1 MS
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: BH24-02 0'
Prep Type: Total/NA
Prep Batch: 17098

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]	ND		24.9	21.0		mg/Kg		84	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*184*		*35 - 166*

Lab Sample ID: 885-16239-1 MSD
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: BH24-02 0'
Prep Type: Total/NA
Prep Batch: 17098

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics [C6 - C10]	ND		25.0	24.3		mg/Kg		97	70 - 130	15	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*195*		*35 - 166*

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 885-17098/1-A
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17098

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		12/05/24 11:26	12/06/24 17:45	1
Ethylbenzene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 17:45	1
Toluene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 17:45	1

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16239-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: MB 885-17098/1-A
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17098

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		0.10		mg/Kg		12/05/24 11:26	12/06/24 17:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*48 - 145*	*12/05/24 11:26*	*12/06/24 17:45*	*1*

Lab Sample ID: LCS 885-17098/3-A
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17098

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			1.00	0.968		mg/Kg		97	70 - 130		
Ethylbenzene			1.00	0.990		mg/Kg		99	70 - 130		
m,p-Xylene			2.00	1.96		mg/Kg		98	70 - 130		
o-Xylene			1.00	0.982		mg/Kg		98	70 - 130		
Toluene			1.00	0.974		mg/Kg		97	70 - 130		
Xylenes, Total			3.00	2.94		mg/Kg		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*

Lab Sample ID: 885-16239-2 MS
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: BH24-06 0'
Prep Type: Total/NA
Prep Batch: 17098

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene	ND		0.989	0.973		mg/Kg		98	70 - 130		
Ethylbenzene	ND		0.989	1.01		mg/Kg		102	70 - 130		
m,p-Xylene	ND		1.98	2.01		mg/Kg		102	70 - 130		
o-Xylene	ND		0.989	1.01		mg/Kg		102	70 - 130		
Toluene	ND		0.989	0.991		mg/Kg		100	70 - 130		
Xylenes, Total	ND		2.97	3.02		mg/Kg		102	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*48 - 145*

Lab Sample ID: 885-16239-2 MSD
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: BH24-06 0'
Prep Type: Total/NA
Prep Batch: 17098

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		0.988	0.966		mg/Kg		98	70 - 130	1	20
Ethylbenzene	ND		0.988	1.01		mg/Kg		102	70 - 130	0	20
m,p-Xylene	ND		1.98	1.99		mg/Kg		101	70 - 130	1	20
o-Xylene	ND		0.988	1.01		mg/Kg		102	70 - 130	0	20
Toluene	ND		0.988	0.988		mg/Kg		100	70 - 130	0	20
Xylenes, Total	ND		2.96	3.00		mg/Kg		101	70 - 130	1	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16239-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: 885-16239-2 MSD
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: BH24-06 0'
Prep Type: Total/NA
Prep Batch: 17098

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*98*		*48 - 145*

Method: 8015M/D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: LCS 885-17106/2-A
Matrix: Solid
Analysis Batch: 17090

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17106

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]			50.0	53.6		mg/Kg		107	60 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Di-n-octyl phthalate (Surr)	*110*		*62 - 134*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-17017/1-A
Matrix: Solid
Analysis Batch: 16985

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17017

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0		mg/Kg		12/04/24 12:59	12/04/24 15:57	1

Lab Sample ID: LCS 885-17017/2-A
Matrix: Solid
Analysis Batch: 16985

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17017

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			30.0	29.4		mg/Kg		98	90 - 110		

Lab Sample ID: MB 885-17026/1-A
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17026

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0		mg/Kg		12/04/24 14:37	12/05/24 08:56	1

Lab Sample ID: LCS 885-17026/2-A
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17026

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			30.0	29.0		mg/Kg		97	90 - 110		

QC Association Summary

Client: Vertex Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

GC VOA

Prep Batch: 17098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	5030C	
885-16239-2	BH24-06 0'	Total/NA	Solid	5030C	
885-16239-3	BH24-10 0'	Total/NA	Solid	5030C	
885-16239-4	BH24-08 0'	Total/NA	Solid	5030C	
MB 885-17098/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 885-17098/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCS 885-17098/3-A	Lab Control Sample	Total/NA	Solid	5030C	
885-16239-1 MS	BH24-02 0'	Total/NA	Solid	5030C	
885-16239-1 MSD	BH24-02 0'	Total/NA	Solid	5030C	
885-16239-2 MS	BH24-06 0'	Total/NA	Solid	5030C	
885-16239-2 MSD	BH24-06 0'	Total/NA	Solid	5030C	

Analysis Batch: 17251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	8015M/D	17098
885-16239-2	BH24-06 0'	Total/NA	Solid	8015M/D	17098
885-16239-3	BH24-10 0'	Total/NA	Solid	8015M/D	17098
885-16239-4	BH24-08 0'	Total/NA	Solid	8015M/D	17098
MB 885-17098/1-A	Method Blank	Total/NA	Solid	8015M/D	17098
LCS 885-17098/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	17098
885-16239-1 MS	BH24-02 0'	Total/NA	Solid	8015M/D	17098
885-16239-1 MSD	BH24-02 0'	Total/NA	Solid	8015M/D	17098

Analysis Batch: 17252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	8021B	17098
885-16239-2	BH24-06 0'	Total/NA	Solid	8021B	17098
885-16239-3	BH24-10 0'	Total/NA	Solid	8021B	17098
885-16239-4	BH24-08 0'	Total/NA	Solid	8021B	17098
MB 885-17098/1-A	Method Blank	Total/NA	Solid	8021B	17098
LCS 885-17098/3-A	Lab Control Sample	Total/NA	Solid	8021B	17098
885-16239-2 MS	BH24-06 0'	Total/NA	Solid	8021B	17098
885-16239-2 MSD	BH24-06 0'	Total/NA	Solid	8021B	17098

GC Semi VOA

Analysis Batch: 17090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	8015M/D	17106
885-16239-2	BH24-06 0'	Total/NA	Solid	8015M/D	17106
885-16239-3	BH24-10 0'	Total/NA	Solid	8015M/D	17106
885-16239-4	BH24-08 0'	Total/NA	Solid	8015M/D	17106
LCS 885-17106/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	17106

Prep Batch: 17106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	SHAKE	
885-16239-2	BH24-06 0'	Total/NA	Solid	SHAKE	
885-16239-3	BH24-10 0'	Total/NA	Solid	SHAKE	
885-16239-4	BH24-08 0'	Total/NA	Solid	SHAKE	
LCS 885-17106/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

QC Association Summary

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

HPLC/IC

Analysis Batch: 16985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-2	BH24-06 0'	Total/NA	Solid	300.0	17017
885-16239-3	BH24-10 0'	Total/NA	Solid	300.0	17017
885-16239-4	BH24-08 0'	Total/NA	Solid	300.0	17017
MB 885-17017/1-A	Method Blank	Total/NA	Solid	300.0	17017
LCS 885-17017/2-A	Lab Control Sample	Total/NA	Solid	300.0	17017

Prep Batch: 17017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-2	BH24-06 0'	Total/NA	Solid	300_Prep	
885-16239-3	BH24-10 0'	Total/NA	Solid	300_Prep	
885-16239-4	BH24-08 0'	Total/NA	Solid	300_Prep	
MB 885-17017/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-17017/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Prep Batch: 17026

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	300_Prep	
MB 885-17026/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-17026/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Analysis Batch: 17068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16239-1	BH24-02 0'	Total/NA	Solid	300.0	17026
MB 885-17026/1-A	Method Blank	Total/NA	Solid	300.0	17026
LCS 885-17026/2-A	Lab Control Sample	Total/NA	Solid	300.0	17026

Lab Chronicle

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-02 0'
Lab Sample ID: 885-16239-1
Date Collected: 11/25/24 12:00
Matrix: Solid
Date Received: 12/04/24 07:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 18:07
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 18:07
Total/NA	Prep	SHAKE			17106	MI	EET ALB	12/05/24 11:58
Total/NA	Analysis	8015M/D		1	17090	MI	EET ALB	12/05/24 13:38
Total/NA	Prep	300_Prep			17026	EH	EET ALB	12/04/24 14:37
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 13:41

Client Sample ID: BH24-06 0'
Lab Sample ID: 885-16239-2
Date Collected: 11/25/24 13:05
Matrix: Solid
Date Received: 12/04/24 07:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 19:12
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 19:12
Total/NA	Prep	SHAKE			17106	MI	EET ALB	12/05/24 11:58
Total/NA	Analysis	8015M/D		1	17090	MI	EET ALB	12/05/24 13:50
Total/NA	Prep	300_Prep			17017	ES	EET ALB	12/04/24 12:59
Total/NA	Analysis	300.0		20	16985	JT	EET ALB	12/04/24 21:01

Client Sample ID: BH24-10 0'
Lab Sample ID: 885-16239-3
Date Collected: 11/26/24 08:00
Matrix: Solid
Date Received: 12/04/24 07:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 20:18
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 20:18
Total/NA	Prep	SHAKE			17106	MI	EET ALB	12/05/24 11:58
Total/NA	Analysis	8015M/D		1	17090	MI	EET ALB	12/05/24 14:02
Total/NA	Prep	300_Prep			17017	ES	EET ALB	12/04/24 12:59
Total/NA	Analysis	300.0		20	16985	JT	EET ALB	12/04/24 21:12

Client Sample ID: BH24-08 0'
Lab Sample ID: 885-16239-4
Date Collected: 11/25/24 14:00
Matrix: Solid
Date Received: 12/04/24 07:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 20:39

Lab Chronicle

Client: Vertex
Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-08 0'
Lab Sample ID: 885-16239-4
Date Collected: 11/25/24 14:00
Matrix: Solid
Date Received: 12/04/24 07:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 11:26
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 20:39
Total/NA	Prep	SHAKE			17106	MI	EET ALB	12/05/24 11:58
Total/NA	Analysis	8015M/D		1	17090	MI	EET ALB	12/05/24 14:14
Total/NA	Prep	300_Prep			17017	ES	EET ALB	12/04/24 15:09
Total/NA	Analysis	300.0		20	16985	JT	EET ALB	12/04/24 21:23

Laboratory References:

EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Vertex Job ID: 885-16239-1
Project/Site: Cranbrook State Com 1H

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
300.0	300_Prep	Solid	Chloride
8015M/D	5030C	Solid	Gasoline Range Organics [C6 - C10]
8015M/D	SHAKE	Solid	Diesel Range Organics [C10-C28]
8015M/D	SHAKE	Solid	Motor Oil Range Organics [C28-C40]
8021B	5030C	Solid	Benzene
8021B	5030C	Solid	Ethylbenzene
8021B	5030C	Solid	Toluene
8021B	5030C	Solid	Xylenes, Total

Oregon	NELAP	NM100001	02-25-25

Chain-of-Custody Record

Client: **Vertex (bill to Mack Energy, Matt Buckles)**

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 X Rush_5-day-rush

Project Name:
Cranbrook State Com 1H

Project #:
24E-04970

Project Manager:
Sally Carttar
SCarttar@vertexresource.com

Sampler: L. Pullman
On Ice: ☒ Yes ☐ No
# of Coolers: 1 409
Cooler Temp(including CF): 4.2+0.3=4.5

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

885-16239 COC

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)
11.25.24	12:00	Soil	BH24-02 0'	1, 4oz jar	ice		X	X					X			
11.25.24	13:05	Soil	BH24-06 0'	1, 4oz jar			X	X					X			
11.26.24	8:00	Soil	BH24-10 0'	1, 4oz jar			X	X					X			
11.25.24	14:00	Soil	BH24-08 0'	"			X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
12-3-24	0700	Lakin Pullman				
12/3/24	1900			courier	12/4/24	7:50

Remarks:
Direct Bill to Mack Energy: ATTN: Matt Buckles
CC.Sally Carttar (SCarttar@vertexresource.com),
Katrina.Taylor@vertexresource.com and Lakin Pullman
(LPullman@vertexresource.com)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.

Login Sample Receipt Checklist

Client: Vertex Job Number: 885-16239-1

Login Number: 16239 **List Source: Eurofins Albuquerque**
List Number: 1
Creator: Casarrubias, Tracy

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
TCEQ Mtd 1005 soil sample was frozen/delivered for prep within 48H of sampling.	True	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Sally Carttar
Vertex
3101 Boyd Dr
Carlsbad, New Mexico 88220

Generated 1/24/2025 4:18:54 PM

JOB DESCRIPTION

Cranbrook State Com 1H

JOB NUMBER

885-18633-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

See page two for job notes and contact information.

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization

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1/24/2025 4:18:54 PM

Authorized for release by
Cheyenne Cason, Project Manager
cheyenne.cason@et.eurofinsus.com
(505)345-3975

Client: Vertex
Project/Site: Cranbrook State Com 1H

Laboratory Job ID: 885-18633-1

Table of Contents

Definitions/Glossary

Client: Vertex Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Qualifiers

GC VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits

GC Semi VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Vertex Job ID: 885-18633-1
Project: Cranbrook State Com 1H

Job ID: 885-18633-1 Eurofins Albuquerque

Job Narrative
885-18633-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 1/18/2025 8:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.4°C.

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015D_DRO: The continuing calibration verification (CCV) associated with batch 885-19647 recovered above the upper control limit for Diesel Range Organics [C10-C28]. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: WS25-05 0.5-1' (885-18633-1), BS25-16 0.5' (885-18633-2), BS25-17 0.5' (885-18633-3), BS25-18 0.5' (885-18633-4), BS25-19 0.5' (885-18633-5), BS25-20 0.5' (885-18633-6), BS25-21 0.5' (885-18633-7) and BS25-22 0.5' (885-18633-8).

Method 8015D_DRO: Surrogate recovery for the following sample was outside the upper control limit: BS25-26 0.5' (885-18633-12). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: WS25-05 0.5-1'

Date Collected: 01/14/25 13:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-1
Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 11:49	01/22/25 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 18:31*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND	F2	0.025		mg/Kg		01/21/25 11:49	01/22/25 18:31	1
Ethylbenzene	ND	F2	0.050		mg/Kg		01/21/25 11:49	01/22/25 18:31	1
Toluene	ND	F2	0.050		mg/Kg		01/21/25 11:49	01/22/25 18:31	1
Xylenes, Total	ND	F2	0.10		mg/Kg		01/21/25 11:49	01/22/25 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 11:49*	*01/22/25 18:31*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.8		mg/Kg		01/21/25 13:17	01/22/25 08:55	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/21/25 13:17	01/22/25 08:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*91*		*62 - 134*	*01/21/25 13:17*	*01/22/25 08:55*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**460**		60		mg/Kg		01/21/25 12:49	01/21/25 14:42	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-16 0.5'
Lab Sample ID: 885-18633-2
Date Collected: 01/15/25 09:45
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 11:49	01/22/25 19:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/21/25 11:49*	*01/22/25 19:42*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 19:42	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 19:42	1
Toluene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 19:42	1
Xylenes, Total	ND		0.098		mg/Kg		01/21/25 11:49	01/22/25 19:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*48 - 145*	*01/21/25 11:49*	*01/22/25 19:42*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/21/25 13:17	01/22/25 09:05	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/21/25 13:17	01/22/25 09:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*66*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:05*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		60		mg/Kg		01/21/25 12:49	01/21/25 15:13	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-17 0.5'
Date Collected: 01/15/25 10:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-3
Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 11:49	01/22/25 20:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 20:05*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 11:49	01/22/25 20:05	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 20:05	1
Toluene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 20:05	1
Xylenes, Total	ND		0.093		mg/Kg		01/21/25 11:49	01/22/25 20:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*48 - 145*	*01/21/25 11:49*	*01/22/25 20:05*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/21/25 13:17	01/22/25 09:16	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/21/25 13:17	01/22/25 09:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*97*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:16*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		60		mg/Kg		01/21/25 12:49	01/21/25 15:44	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-18 0.5'

Date Collected: 01/15/25 10:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-4

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 11:49	01/22/25 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/21/25 11:49*	*01/22/25 20:29*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 20:29	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 20:29	1
Toluene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 20:29	1
Xylenes, Total	ND		0.098		mg/Kg		01/21/25 11:49	01/22/25 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*48 - 145*	*01/21/25 11:49*	*01/22/25 20:29*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/21/25 13:17	01/22/25 09:26	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/21/25 13:17	01/22/25 09:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*123*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:26*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		60		mg/Kg		01/21/25 12:49	01/21/25 15:54	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-19 0.5'
Lab Sample ID: 885-18633-5
Date Collected: 01/15/25 11:00
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 11:49	01/22/25 20:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 20:53*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 20:53	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 20:53	1
Toluene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 20:53	1
Xylenes, Total	ND		0.098		mg/Kg		01/21/25 11:49	01/22/25 20:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 11:49*	*01/22/25 20:53*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/21/25 13:17	01/22/25 09:37	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/21/25 13:17	01/22/25 09:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*98*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:37*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		60		mg/Kg		01/21/25 12:49	01/21/25 16:25	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-20 0.5'

Date Collected: 01/15/25 11:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-6

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 11:49	01/22/25 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*35 - 166*	*01/21/25 11:49*	*01/22/25 21:40*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 21:40	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 21:40	1
Toluene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 21:40	1
Xylenes, Total	ND		0.099		mg/Kg		01/21/25 11:49	01/22/25 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 11:49*	*01/22/25 21:40*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.7		mg/Kg		01/21/25 13:17	01/22/25 09:47	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/21/25 13:17	01/22/25 09:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*106*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:47*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**250**		59		mg/Kg		01/21/25 12:49	01/21/25 16:35	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-21 0.5'
Lab Sample ID: 885-18633-7
Date Collected: 01/15/25 12:00
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 11:49	01/22/25 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/21/25 11:49*	*01/22/25 22:04*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 22:04	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 22:04	1
Toluene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 22:04	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 11:49	01/22/25 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 11:49*	*01/22/25 22:04*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.7		mg/Kg		01/21/25 13:17	01/22/25 09:58	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/21/25 13:17	01/22/25 09:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*123*		*62 - 134*	*01/21/25 13:17*	*01/22/25 09:58*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**230**		60		mg/Kg		01/21/25 12:49	01/21/25 16:46	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-22 0.5'

Date Collected: 01/15/25 12:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-8

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 11:49	01/22/25 22:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*35 - 166*	*01/21/25 11:49*	*01/22/25 22:27*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 11:49	01/22/25 22:27	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 22:27	1
Toluene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 22:27	1
Xylenes, Total	ND		0.093		mg/Kg		01/21/25 11:49	01/22/25 22:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*48 - 145*	*01/21/25 11:49*	*01/22/25 22:27*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.5		mg/Kg		01/21/25 13:17	01/22/25 10:09	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/21/25 13:17	01/22/25 10:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*107*		*62 - 134*	*01/21/25 13:17*	*01/22/25 10:09*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**540**		60		mg/Kg		01/21/25 12:49	01/21/25 16:56	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-23 0.5'
Lab Sample ID: 885-18633-9
Date Collected: 01/15/25 13:00
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 11:49	01/22/25 22:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 22:51*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 11:49	01/22/25 22:51	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 22:51	1
Toluene	ND		0.047		mg/Kg		01/21/25 11:49	01/22/25 22:51	1
Xylenes, Total	ND		0.094		mg/Kg		01/21/25 11:49	01/22/25 22:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*48 - 145*	*01/21/25 11:49*	*01/22/25 22:51*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.6		mg/Kg		01/21/25 13:17	01/22/25 11:45	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/21/25 13:17	01/22/25 11:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*93*		*62 - 134*	*01/21/25 13:17*	*01/22/25 11:45*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**520**		60		mg/Kg		01/21/25 12:49	01/21/25 17:06	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-24 0.5'

Date Collected: 01/15/25 13:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-10

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 11:49	01/22/25 23:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 23:14*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 11:49	01/22/25 23:14	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 11:49	01/22/25 23:14	1
Toluene	ND		0.048		mg/Kg		01/21/25 11:49	01/22/25 23:14	1
Xylenes, Total	ND		0.096		mg/Kg		01/21/25 11:49	01/22/25 23:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*109*		*48 - 145*	*01/21/25 11:49*	*01/22/25 23:14*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.5		mg/Kg		01/21/25 13:17	01/22/25 11:56	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/21/25 13:17	01/22/25 11:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*74*		*62 - 134*	*01/21/25 13:17*	*01/22/25 11:56*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		60		mg/Kg		01/21/25 12:49	01/21/25 17:17	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-25 0.5'
Lab Sample ID: 885-18633-11
Date Collected: 01/15/25 14:00
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 11:49	01/22/25 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*35 - 166*	*01/21/25 11:49*	*01/22/25 23:38*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 11:49	01/22/25 23:38	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 23:38	1
Toluene	ND		0.049		mg/Kg		01/21/25 11:49	01/22/25 23:38	1
Xylenes, Total	ND		0.097		mg/Kg		01/21/25 11:49	01/22/25 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*48 - 145*	*01/21/25 11:49*	*01/22/25 23:38*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		01/21/25 13:17	01/22/25 12:07	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/21/25 13:17	01/22/25 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*112*		*62 - 134*	*01/21/25 13:17*	*01/22/25 12:07*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**480**		60		mg/Kg		01/21/25 12:49	01/21/25 17:27	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-26 0.5'

Date Collected: 01/15/25 14:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-12

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 11:49	01/23/25 00:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/21/25 11:49*	*01/23/25 00:01*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 11:49	01/23/25 00:01	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 11:49	01/23/25 00:01	1
Toluene	ND		0.049		mg/Kg		01/21/25 11:49	01/23/25 00:01	1
Xylenes, Total	ND		0.098		mg/Kg		01/21/25 11:49	01/23/25 00:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 11:49*	*01/23/25 00:01*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.3		mg/Kg		01/21/25 13:17	01/22/25 12:17	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/21/25 13:17	01/22/25 12:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*136*	*S1+*	*62 - 134*	*01/21/25 13:17*	*01/22/25 12:17*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**530**		60		mg/Kg		01/21/25 12:49	01/21/25 17:37	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-05 0.5'

Date Collected: 01/14/25 08:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-13

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 12:22	01/23/25 00:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/21/25 12:22*	*01/23/25 00:25*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 12:22	01/23/25 00:25	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 12:22	01/23/25 00:25	1
Toluene	ND		0.049		mg/Kg		01/21/25 12:22	01/23/25 00:25	1
Xylenes, Total	ND		0.099		mg/Kg		01/21/25 12:22	01/23/25 00:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 12:22*	*01/23/25 00:25*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/21/25 13:17	01/22/25 12:49	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/21/25 13:17	01/22/25 12:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*95*		*62 - 134*	*01/21/25 13:17*	*01/22/25 12:49*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**		60		mg/Kg		01/21/25 12:49	01/21/25 17:48	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-06 0.5'

Date Collected: 01/14/25 08:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-14

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 12:22	01/23/25 00:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 12:22*	*01/23/25 00:48*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 12:22	01/23/25 00:48	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 12:22	01/23/25 00:48	1
Toluene	ND		0.050		mg/Kg		01/21/25 12:22	01/23/25 00:48	1
Xylenes, Total	ND		0.099		mg/Kg		01/21/25 12:22	01/23/25 00:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*	*01/21/25 12:22*	*01/23/25 00:48*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.9		mg/Kg		01/21/25 13:17	01/22/25 13:00	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/21/25 13:17	01/22/25 13:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*90*		*62 - 134*	*01/21/25 13:17*	*01/22/25 13:00*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		60		mg/Kg		01/21/25 12:49	01/21/25 17:58	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-07 0.5'

Date Collected: 01/14/25 09:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-15

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 12:22	01/23/25 01:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*35 - 166*	*01/21/25 12:22*	*01/23/25 01:12*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 12:22	01/23/25 01:12	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 12:22	01/23/25 01:12	1
Toluene	ND		0.048		mg/Kg		01/21/25 12:22	01/23/25 01:12	1
Xylenes, Total	ND		0.096		mg/Kg		01/21/25 12:22	01/23/25 01:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*48 - 145*	*01/21/25 12:22*	*01/23/25 01:12*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**17**		9.8		mg/Kg		01/21/25 13:17	01/22/25 13:11	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/21/25 13:17	01/22/25 13:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*112*		*62 - 134*	*01/21/25 13:17*	*01/22/25 13:11*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**310**		60		mg/Kg		01/21/25 12:49	01/21/25 18:29	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-08 0.5'

Date Collected: 01/14/25 09:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-16

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*35 - 166*	*01/21/25 15:00*	*01/23/25 19:10*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 19:10	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 19:10	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 19:10	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/23/25 19:10*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		10		mg/Kg		01/22/25 10:56	01/22/25 15:52	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/22/25 10:56	01/22/25 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*94*		*62 - 134*	*01/22/25 10:56*	*01/22/25 15:52*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**93**		60		mg/Kg		01/21/25 12:49	01/21/25 18:40	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-09 0.5'

Date Collected: 01/14/25 10:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-17

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*35 - 166*	*01/21/25 15:00*	*01/23/25 20:16*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 20:16	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 20:16	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 20:16	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*01/21/25 15:00*	*01/23/25 20:16*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/22/25 10:56	01/22/25 16:03	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/22/25 10:56	01/22/25 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*95*		*62 - 134*	*01/22/25 10:56*	*01/22/25 16:03*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**98**		60		mg/Kg		01/21/25 12:49	01/21/25 18:50	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-10 0.5'

Date Collected: 01/14/25 10:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-18

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.6		mg/Kg		01/21/25 15:00	01/23/25 21:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*35 - 166*	*01/21/25 15:00*	*01/23/25 21:21*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 15:00	01/23/25 21:21	1
Ethylbenzene	ND		0.046		mg/Kg		01/21/25 15:00	01/23/25 21:21	1
Toluene	ND		0.046		mg/Kg		01/21/25 15:00	01/23/25 21:21	1
Xylenes, Total	ND		0.093		mg/Kg		01/21/25 15:00	01/23/25 21:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*01/21/25 15:00*	*01/23/25 21:21*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.1		mg/Kg		01/22/25 10:56	01/22/25 16:14	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/22/25 10:56	01/22/25 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*100*		*62 - 134*	*01/22/25 10:56*	*01/22/25 16:14*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**94**		60		mg/Kg		01/21/25 12:49	01/21/25 19:00	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-11 0.5'
Lab Sample ID: 885-18633-19

Date Collected: 01/14/25 11:00
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*35 - 166*	*01/21/25 15:00*	*01/23/25 21:42*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 21:42	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 21:42	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 21:42	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*01/21/25 15:00*	*01/23/25 21:42*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.8		mg/Kg		01/22/25 10:56	01/22/25 16:24	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/22/25 10:56	01/22/25 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*98*		*62 - 134*	*01/22/25 10:56*	*01/22/25 16:24*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		60		mg/Kg		01/21/25 12:49	01/21/25 19:11	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-12 0.5'

Date Collected: 01/14/25 11:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-20

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*35 - 166*	*01/21/25 15:00*	*01/23/25 22:04*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 22:04	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 22:04	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 22:04	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*01/21/25 15:00*	*01/23/25 22:04*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.5		mg/Kg		01/22/25 10:56	01/22/25 16:56	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 16:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*97*		*62 - 134*	*01/22/25 10:56*	*01/22/25 16:56*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		60		mg/Kg		01/22/25 07:12	01/22/25 11:18	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-13 0.5'

Date Collected: 01/14/25 12:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-21

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 15:00	01/23/25 22:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*35 - 166*	*01/21/25 15:00*	*01/23/25 22:26*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/23/25 22:26	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 15:00	01/23/25 22:26	1
Toluene	ND		0.048		mg/Kg		01/21/25 15:00	01/23/25 22:26	1
Xylenes, Total	ND		0.096		mg/Kg		01/21/25 15:00	01/23/25 22:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/23/25 22:26*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.5		mg/Kg		01/22/25 10:56	01/22/25 17:18	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 17:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*95*		*62 - 134*	*01/22/25 10:56*	*01/22/25 17:18*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**370**		60		mg/Kg		01/22/25 07:12	01/22/25 11:28	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-14 0.5'

Date Collected: 01/14/25 12:30
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-22

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 15:00	01/23/25 22:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*35 - 166*	*01/21/25 15:00*	*01/23/25 22:48*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 15:00	01/23/25 22:48	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 15:00	01/23/25 22:48	1
Toluene	ND		0.047		mg/Kg		01/21/25 15:00	01/23/25 22:48	1
Xylenes, Total	ND		0.093		mg/Kg		01/21/25 15:00	01/23/25 22:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/23/25 22:48*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		01/22/25 10:56	01/22/25 17:28	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 17:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*101*		*62 - 134*	*01/22/25 10:56*	*01/22/25 17:28*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**		60		mg/Kg		01/22/25 07:12	01/22/25 11:39	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-15 1'

Date Collected: 01/14/25 13:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-23

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 15:00	01/23/25 23:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*35 - 166*	*01/21/25 15:00*	*01/23/25 23:09*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/23/25 23:09	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 15:00	01/23/25 23:09	1
Toluene	ND		0.049		mg/Kg		01/21/25 15:00	01/23/25 23:09	1
Xylenes, Total	ND		0.097		mg/Kg		01/21/25 15:00	01/23/25 23:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*01/21/25 15:00*	*01/23/25 23:09*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		01/22/25 10:56	01/22/25 17:39	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*89*		*62 - 134*	*01/22/25 10:56*	*01/22/25 17:39*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**290**		60		mg/Kg		01/22/25 07:12	01/22/25 11:49	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: WS25-04 0-0.5'
Lab Sample ID: 885-18633-24
Date Collected: 01/14/25 13:30
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 23:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*35 - 166*	*01/21/25 15:00*	*01/23/25 23:31*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 23:31	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 23:31	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 23:31	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 23:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*01/21/25 15:00*	*01/23/25 23:31*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**16**		9.5		mg/Kg		01/22/25 10:56	01/22/25 17:49	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/22/25 10:56	01/22/25 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*96*		*62 - 134*	*01/22/25 10:56*	*01/22/25 17:49*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**330**		60		mg/Kg		01/22/25 07:12	01/22/25 11:59	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-27 0.5'

Date Collected: 01/14/25 14:40
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-25

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 15:00	01/23/25 23:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*35 - 166*	*01/21/25 15:00*	*01/23/25 23:53*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/23/25 23:53	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 15:00	01/23/25 23:53	1
Toluene	ND		0.048		mg/Kg		01/21/25 15:00	01/23/25 23:53	1
Xylenes, Total	ND		0.096		mg/Kg		01/21/25 15:00	01/23/25 23:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*48 - 145*	*01/21/25 15:00*	*01/23/25 23:53*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.8		mg/Kg		01/22/25 10:56	01/22/25 18:00	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/22/25 10:56	01/22/25 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*88*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:00*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**460**		60		mg/Kg		01/22/25 07:12	01/22/25 12:30	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-28 0.5'

Date Collected: 01/15/25 14:50
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-26

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 15:00	01/24/25 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*35 - 166*	*01/21/25 15:00*	*01/24/25 00:37*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/24/25 00:37	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 15:00	01/24/25 00:37	1
Toluene	ND		0.048		mg/Kg		01/21/25 15:00	01/24/25 00:37	1
Xylenes, Total	ND		0.096		mg/Kg		01/21/25 15:00	01/24/25 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/24/25 00:37*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.3		mg/Kg		01/22/25 10:56	01/22/25 18:10	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*89*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:10*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**350**		60		mg/Kg		01/22/25 07:12	01/22/25 12:41	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-29 0.5'

Date Collected: 01/15/25 15:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-27

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 15:00	01/24/25 00:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*35 - 166*	*01/21/25 15:00*	*01/24/25 00:58*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/24/25 00:58	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 00:58	1
Toluene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 00:58	1
Xylenes, Total	ND		0.098		mg/Kg		01/21/25 15:00	01/24/25 00:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*48 - 145*	*01/21/25 15:00*	*01/24/25 00:58*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.6		mg/Kg		01/22/25 10:56	01/22/25 18:21	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/22/25 10:56	01/22/25 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*87*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:21*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		60		mg/Kg		01/22/25 07:12	01/22/25 12:51	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-30 0.5'

Date Collected: 01/15/25 15:10
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-28

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/21/25 15:00	01/24/25 01:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*35 - 166*	*01/21/25 15:00*	*01/24/25 01:20*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/24/25 01:20	1
Ethylbenzene	ND		0.048		mg/Kg		01/21/25 15:00	01/24/25 01:20	1
Toluene	ND		0.048		mg/Kg		01/21/25 15:00	01/24/25 01:20	1
Xylenes, Total	ND		0.095		mg/Kg		01/21/25 15:00	01/24/25 01:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/24/25 01:20*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.9		mg/Kg		01/22/25 10:56	01/22/25 18:31	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/22/25 10:56	01/22/25 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*89*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:31*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		60		mg/Kg		01/22/25 07:12	01/22/25 13:01	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: BS25-31 0.5'

Date Collected: 01/15/25 15:20
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-29

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.6		mg/Kg		01/21/25 15:00	01/24/25 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*35 - 166*	*01/21/25 15:00*	*01/24/25 01:42*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 15:00	01/24/25 01:42	1
Ethylbenzene	ND		0.046		mg/Kg		01/21/25 15:00	01/24/25 01:42	1
Toluene	ND		0.046		mg/Kg		01/21/25 15:00	01/24/25 01:42	1
Xylenes, Total	ND		0.092		mg/Kg		01/21/25 15:00	01/24/25 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*01/21/25 15:00*	*01/24/25 01:42*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		01/22/25 10:56	01/22/25 18:42	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/22/25 10:56	01/22/25 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*88*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:42*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**85**		60		mg/Kg		01/22/25 07:12	01/22/25 13:12	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-32 0.5'
Lab Sample ID: 885-18633-30
Date Collected: 01/15/25 15:30
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 15:00	01/24/25 02:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*35 - 166*	*01/21/25 15:00*	*01/24/25 02:03*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		01/21/25 15:00	01/24/25 02:03	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 15:00	01/24/25 02:03	1
Toluene	ND		0.047		mg/Kg		01/21/25 15:00	01/24/25 02:03	1
Xylenes, Total	ND		0.094		mg/Kg		01/21/25 15:00	01/24/25 02:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/24/25 02:03*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.6		mg/Kg		01/22/25 10:56	01/22/25 18:52	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/22/25 10:56	01/22/25 18:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*91*		*62 - 134*	*01/22/25 10:56*	*01/22/25 18:52*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**280**		60		mg/Kg		01/22/25 07:12	01/22/25 13:22	20

Client Sample Results

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: WS25-01 0-0.5'
Lab Sample ID: 885-18633-31
Date Collected: 01/15/25 15:40
Matrix: Solid
Date Received: 01/18/25 08:15

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 15:00	01/24/25 02:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*35 - 166*	*01/21/25 15:00*	*01/24/25 02:25*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/24/25 02:25	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 02:25	1
Toluene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 02:25	1
Xylenes, Total	ND		0.097		mg/Kg		01/21/25 15:00	01/24/25 02:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/24/25 02:25*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.8		mg/Kg		01/22/25 10:56	01/22/25 19:13	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		01/22/25 10:56	01/22/25 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*90*		*62 - 134*	*01/22/25 10:56*	*01/22/25 19:13*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**250**		60		mg/Kg		01/22/25 07:12	01/22/25 13:33	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: WS25-02 0-0.5'

Date Collected: 01/15/25 15:50
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-32

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/21/25 15:00	01/24/25 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*35 - 166*	*01/21/25 15:00*	*01/24/25 02:47*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/24/25 02:47	1
Ethylbenzene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 02:47	1
Toluene	ND		0.049		mg/Kg		01/21/25 15:00	01/24/25 02:47	1
Xylenes, Total	ND		0.099		mg/Kg		01/21/25 15:00	01/24/25 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/24/25 02:47*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/22/25 10:56	01/22/25 19:23	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/22/25 10:56	01/22/25 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*89*		*62 - 134*	*01/22/25 10:56*	*01/22/25 19:23*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**93**		60		mg/Kg		01/22/25 07:12	01/22/25 13:43	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Client Sample ID: WS25-03 0-0.5'
Date Collected: 01/15/25 16:00
Date Received: 01/18/25 08:15

Lab Sample ID: 885-18633-33
Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		01/21/25 15:00	01/24/25 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*35 - 166*	*01/21/25 15:00*	*01/24/25 03:08*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/21/25 15:00	01/24/25 03:08	1
Ethylbenzene	ND		0.047		mg/Kg		01/21/25 15:00	01/24/25 03:08	1
Toluene	ND		0.047		mg/Kg		01/21/25 15:00	01/24/25 03:08	1
Xylenes, Total	ND		0.095		mg/Kg		01/21/25 15:00	01/24/25 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*01/21/25 15:00*	*01/24/25 03:08*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.6		mg/Kg		01/22/25 10:56	01/22/25 19:34	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		01/22/25 10:56	01/22/25 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*90*		*62 - 134*	*01/22/25 10:56*	*01/22/25 19:34*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**		60		mg/Kg		01/22/25 07:12	01/22/25 13:53	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8015M/D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 885-19612/1-A
Matrix: Solid
Analysis Batch: 19680

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19612

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 11:49	01/22/25 15:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/21/25 11:49*	*01/22/25 15:21*	*1*

Lab Sample ID: LCS 885-19612/2-A
Matrix: Solid
Analysis Batch: 19680

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19612

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]			25.0	24.7		mg/Kg		99	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*208*		*35 - 166*

Lab Sample ID: MB 885-19628/1-A
Matrix: Solid
Analysis Batch: 19776

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19628

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/21/25 15:00	01/23/25 18:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*35 - 166*	*01/21/25 15:00*	*01/23/25 18:48*	*1*

Lab Sample ID: LCS 885-19628/2-A
Matrix: Solid
Analysis Batch: 19776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19628

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]			25.0	23.0		mg/Kg		92	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*197*		*35 - 166*

Lab Sample ID: 885-18633-16 MS
Matrix: Solid
Analysis Batch: 19776

Client Sample ID: BS25-08 0.5'
Prep Type: Total/NA
Prep Batch: 19628

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]	ND		25.0	21.8		mg/Kg		87	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*198*		*35 - 166*

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8015M/D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: 885-18633-16 MSD
Matrix: Solid
Analysis Batch: 19776

Client Sample ID: BS25-08 0.5'
Prep Type: Total/NA
Prep Batch: 19628

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics [C6 - C10]	ND		24.9	20.9		mg/Kg		84	70 - 130	4	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*192*		*35 - 166*

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 885-19612/1-A
Matrix: Solid
Analysis Batch: 19681

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19612

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 11:49	01/22/25 15:21	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 15:21	1
Toluene	ND		0.050		mg/Kg		01/21/25 11:49	01/22/25 15:21	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 11:49	01/22/25 15:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*48 - 145*	*01/21/25 11:49*	*01/22/25 15:21*	*1*

Lab Sample ID: LCS 885-19612/4-A
Matrix: Solid
Analysis Batch: 19681

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19612

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			1.00	1.03		mg/Kg		103	70 - 130		
Ethylbenzene			1.00	1.07		mg/Kg		107	70 - 130		
m,p-Xylene			2.00	2.13		mg/Kg		107	70 - 130		
o-Xylene			1.00	1.04		mg/Kg		104	70 - 130		
Toluene			1.00	1.06		mg/Kg		106	70 - 130		
Xylenes, Total			3.00	3.18		mg/Kg		106	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*112*		*48 - 145*

Lab Sample ID: 885-18633-1 MSD
Matrix: Solid
Analysis Batch: 19681

Client Sample ID: WS25-05 0.5-1'
Prep Type: Total/NA
Prep Batch: 19612

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND	F2	0.997	0.967		mg/Kg		97	70 - 130	30	20
Ethylbenzene	ND	F2	0.997	1.03		mg/Kg		103	70 - 130	35	20
m,p-Xylene	ND	F2	1.99	2.02		mg/Kg		102	70 - 130	35	20
o-Xylene	ND	F2	0.997	0.990		mg/Kg		99	70 - 130	36	20
Toluene	ND	F2	0.997	1.00		mg/Kg		101	70 - 130	31	20
Xylenes, Total	ND	F2	2.99	3.01		mg/Kg		101	70 - 130	35	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: 885-18633-1 MSD
Matrix: Solid
Analysis Batch: 19681

Client Sample ID: WS25-05 0.5-1'
Prep Type: Total/NA
Prep Batch: 19612

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*109*		*48 - 145*

Lab Sample ID: MB 885-19628/1-A
Matrix: Solid
Analysis Batch: 19777

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19628

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/21/25 15:00	01/23/25 18:48	1
Ethylbenzene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 18:48	1
Toluene	ND		0.050		mg/Kg		01/21/25 15:00	01/23/25 18:48	1
Xylenes, Total	ND		0.10		mg/Kg		01/21/25 15:00	01/23/25 18:48	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*	*01/21/25 15:00*	*01/23/25 18:48*	*1*

Lab Sample ID: LCS 885-19628/3-A
Matrix: Solid
Analysis Batch: 19777

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19628

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			1.00	0.925		mg/Kg		93	70 - 130		
Ethylbenzene			1.00	0.971		mg/Kg		97	70 - 130		
m,p-Xylene			2.00	1.93		mg/Kg		96	70 - 130		
o-Xylene			1.00	0.984		mg/Kg		98	70 - 130		
Toluene			1.00	0.942		mg/Kg		94	70 - 130		
Xylenes, Total			3.00	2.91		mg/Kg		97	70 - 130		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	*97*		*48 - 145*

Lab Sample ID: 885-18633-17 MS
Matrix: Solid
Analysis Batch: 19777

Client Sample ID: BS25-09 0.5'
Prep Type: Total/NA
Prep Batch: 19628

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene	ND		0.991	0.860		mg/Kg		87	70 - 130		
Ethylbenzene	ND		0.991	0.913		mg/Kg		92	70 - 130		
m,p-Xylene	ND		1.98	1.80		mg/Kg		91	70 - 130		
o-Xylene	ND		0.991	0.916		mg/Kg		92	70 - 130		
Toluene	ND		0.991	0.885		mg/Kg		89	70 - 130		
Xylenes, Total	ND		2.97	2.72		mg/Kg		91	70 - 130		

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: 885-18633-17 MSD
Matrix: Solid
Analysis Batch: 19777

Client Sample ID: BS25-09 0.5'
Prep Type: Total/NA
Prep Batch: 19628

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		0.995	0.815		mg/Kg		82	70 - 130	5	20
Ethylbenzene	ND		0.995	0.874		mg/Kg		88	70 - 130	4	20
m,p-Xylene	ND		1.99	1.72		mg/Kg		86	70 - 130	5	20
o-Xylene	ND		0.995	0.875		mg/Kg		88	70 - 130	5	20
Toluene	ND		0.995	0.845		mg/Kg		85	70 - 130	5	20
Xylenes, Total	ND		2.99	2.60		mg/Kg		87	70 - 130	5	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*93*		*48 - 145*

Method: 8015M/D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 885-19620/1-A
Matrix: Solid
Analysis Batch: 19647

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19620

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		10		mg/Kg		01/21/25 13:17	01/22/25 14:58	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/21/25 13:17	01/22/25 14:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*131*		*62 - 134*	*01/21/25 13:17*	*01/22/25 14:58*	*1*

Lab Sample ID: LCS 885-19620/2-A
Matrix: Solid
Analysis Batch: 19647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19620

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]			50.0	59.9		mg/Kg		120	60 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Di-n-octyl phthalate (Surr)	*120*		*62 - 134*

Lab Sample ID: 885-18633-A-12-C MS
Matrix: Solid
Analysis Batch: 19647

Client Sample ID: 885-18633-A-12-C MS
Prep Type: Total/NA
Prep Batch: 19620

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]	ND		48.8	42.2		mg/Kg		86	44 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Di-n-octyl phthalate (Surr)	*70*		*62 - 134*

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8015M/D - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 885-18633-A-12-D MSD — **Client Sample ID: 885-18633-A-12-D MSD**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 19647 — **Prep Batch: 19620**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]	ND		49.3	43.5		mg/Kg		88	44 - 136	3	32

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Di-n-octyl phthalate (Surr)	*74*		*62 - 134*

Lab Sample ID: MB 885-19673/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 19647 — **Prep Batch: 19673**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		10		mg/Kg		01/22/25 10:56	01/22/25 15:20	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/22/25 10:56	01/22/25 15:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*88*		*62 - 134*	*01/22/25 10:56*	*01/22/25 15:20*	*1*

Lab Sample ID: LCS 885-19673/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 19647 — **Prep Batch: 19673**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]			50.0	49.5		mg/Kg		99	60 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Di-n-octyl phthalate (Surr)	*85*		*62 - 134*

Lab Sample ID: 885-18633-19 MS — **Client Sample ID: BS25-11 0.5'**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 19647 — **Prep Batch: 19673**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]	ND		47.3	47.3		mg/Kg		100	44 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Di-n-octyl phthalate (Surr)	*91*		*62 - 134*

Lab Sample ID: 885-18633-19 MSD — **Client Sample ID: BS25-11 0.5'**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 19647 — **Prep Batch: 19673**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]	ND		47.1	47.1		mg/Kg		100	44 - 136	0	32

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 8015M/D - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 885-18633-19 MSD
Matrix: Solid
Analysis Batch: 19647

Client Sample ID: BS25-11 0.5'
Prep Type: Total/NA
Prep Batch: 19673

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Di-n-octyl phthalate (Surr)	*90*		*62 - 134*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-19616/1-A
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19616

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0		mg/Kg		01/21/25 12:49	01/21/25 14:06	1

Lab Sample ID: LCS 885-19616/2-A
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19616

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			30.0	29.9		mg/Kg		100	90 - 110		

Lab Sample ID: 885-18633-1 MS
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: WS25-05 0.5-1'
Prep Type: Total/NA
Prep Batch: 19616

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	460		30.1	477	4	mg/Kg		59	50 - 150		

Lab Sample ID: 885-18633-1 MSD
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: WS25-05 0.5-1'
Prep Type: Total/NA
Prep Batch: 19616

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	460		30.0	488	4	mg/Kg		95	50 - 150	2	20

Lab Sample ID: 885-18633-2 MS
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: BS25-16 0.5'
Prep Type: Total/NA
Prep Batch: 19616

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	160		29.9	188	4	mg/Kg		93	50 - 150		

Lab Sample ID: 885-18633-2 MSD
Matrix: Solid
Analysis Batch: 19608

Client Sample ID: BS25-16 0.5'
Prep Type: Total/NA
Prep Batch: 19616

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	160		30.1	193	4	mg/Kg		109	50 - 150	3	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 885-19645/1-A
Matrix: Solid
Analysis Batch: 19646

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19645

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.5		mg/Kg		01/22/25 07:12	01/22/25 08:16	1

Lab Sample ID: LCS 885-19645/2-A
Matrix: Solid
Analysis Batch: 19646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19645

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			15.0	14.9		mg/Kg		99	90 - 110		

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

GC VOA

Prep Batch: 19612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	5030C	
885-18633-2	BS25-16 0.5'	Total/NA	Solid	5030C	
885-18633-3	BS25-17 0.5'	Total/NA	Solid	5030C	
885-18633-4	BS25-18 0.5'	Total/NA	Solid	5030C	
885-18633-5	BS25-19 0.5'	Total/NA	Solid	5030C	
885-18633-6	BS25-20 0.5'	Total/NA	Solid	5030C	
885-18633-7	BS25-21 0.5'	Total/NA	Solid	5030C	
885-18633-8	BS25-22 0.5'	Total/NA	Solid	5030C	
885-18633-9	BS25-23 0.5'	Total/NA	Solid	5030C	
885-18633-10	BS25-24 0.5'	Total/NA	Solid	5030C	
885-18633-11	BS25-25 0.5'	Total/NA	Solid	5030C	
885-18633-12	BS25-26 0.5'	Total/NA	Solid	5030C	
885-18633-13	BS25-05 0.5'	Total/NA	Solid	5030C	
885-18633-14	BS25-06 0.5'	Total/NA	Solid	5030C	
885-18633-15	BS25-07 0.5'	Total/NA	Solid	5030C	
MB 885-19612/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 885-19612/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCS 885-19612/4-A	Lab Control Sample	Total/NA	Solid	5030C	
885-18633-1 MSD	WS25-05 0.5-1'	Total/NA	Solid	5030C	

Prep Batch: 19628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-16	BS25-08 0.5'	Total/NA	Solid	5030C	
885-18633-17	BS25-09 0.5'	Total/NA	Solid	5030C	
885-18633-18	BS25-10 0.5'	Total/NA	Solid	5030C	
885-18633-19	BS25-11 0.5'	Total/NA	Solid	5030C	
885-18633-20	BS25-12 0.5'	Total/NA	Solid	5030C	
885-18633-21	BS25-13 0.5'	Total/NA	Solid	5030C	
885-18633-22	BS25-14 0.5'	Total/NA	Solid	5030C	
885-18633-23	BS25-15 1'	Total/NA	Solid	5030C	
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	5030C	
885-18633-25	BS25-27 0.5'	Total/NA	Solid	5030C	
885-18633-26	BS25-28 0.5'	Total/NA	Solid	5030C	
885-18633-27	BS25-29 0.5'	Total/NA	Solid	5030C	
885-18633-28	BS25-30 0.5'	Total/NA	Solid	5030C	
885-18633-29	BS25-31 0.5'	Total/NA	Solid	5030C	
885-18633-30	BS25-32 0.5'	Total/NA	Solid	5030C	
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	5030C	
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	5030C	
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	5030C	
MB 885-19628/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 885-19628/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCS 885-19628/3-A	Lab Control Sample	Total/NA	Solid	5030C	
885-18633-16 MS	BS25-08 0.5'	Total/NA	Solid	5030C	
885-18633-16 MSD	BS25-08 0.5'	Total/NA	Solid	5030C	
885-18633-17 MS	BS25-09 0.5'	Total/NA	Solid	5030C	
885-18633-17 MSD	BS25-09 0.5'	Total/NA	Solid	5030C	

Analysis Batch: 19680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	8015M/D	19612

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

GC VOA (Continued)

Analysis Batch: 19680 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-2	BS25-16 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-3	BS25-17 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-4	BS25-18 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-5	BS25-19 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-6	BS25-20 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-7	BS25-21 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-8	BS25-22 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-9	BS25-23 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-10	BS25-24 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-11	BS25-25 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-12	BS25-26 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-13	BS25-05 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-14	BS25-06 0.5'	Total/NA	Solid	8015M/D	19612
885-18633-15	BS25-07 0.5'	Total/NA	Solid	8015M/D	19612
MB 885-19612/1-A	Method Blank	Total/NA	Solid	8015M/D	19612
LCS 885-19612/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19612

Analysis Batch: 19681

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	8021B	19612
885-18633-2	BS25-16 0.5'	Total/NA	Solid	8021B	19612
885-18633-3	BS25-17 0.5'	Total/NA	Solid	8021B	19612
885-18633-4	BS25-18 0.5'	Total/NA	Solid	8021B	19612
885-18633-5	BS25-19 0.5'	Total/NA	Solid	8021B	19612
885-18633-6	BS25-20 0.5'	Total/NA	Solid	8021B	19612
885-18633-7	BS25-21 0.5'	Total/NA	Solid	8021B	19612
885-18633-8	BS25-22 0.5'	Total/NA	Solid	8021B	19612
885-18633-9	BS25-23 0.5'	Total/NA	Solid	8021B	19612
885-18633-10	BS25-24 0.5'	Total/NA	Solid	8021B	19612
885-18633-11	BS25-25 0.5'	Total/NA	Solid	8021B	19612
885-18633-12	BS25-26 0.5'	Total/NA	Solid	8021B	19612
885-18633-13	BS25-05 0.5'	Total/NA	Solid	8021B	19612
885-18633-14	BS25-06 0.5'	Total/NA	Solid	8021B	19612
885-18633-15	BS25-07 0.5'	Total/NA	Solid	8021B	19612
MB 885-19612/1-A	Method Blank	Total/NA	Solid	8021B	19612
LCS 885-19612/4-A	Lab Control Sample	Total/NA	Solid	8021B	19612
885-18633-1 MSD	WS25-05 0.5-1'	Total/NA	Solid	8021B	19612

Analysis Batch: 19776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-16	BS25-08 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-17	BS25-09 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-18	BS25-10 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-19	BS25-11 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-20	BS25-12 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-21	BS25-13 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-22	BS25-14 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-23	BS25-15 1'	Total/NA	Solid	8015M/D	19628
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	8015M/D	19628
885-18633-25	BS25-27 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-26	BS25-28 0.5'	Total/NA	Solid	8015M/D	19628

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

GC VOA (Continued)

Analysis Batch: 19776 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-27	BS25-29 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-28	BS25-30 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-29	BS25-31 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-30	BS25-32 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	8015M/D	19628
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	8015M/D	19628
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	8015M/D	19628
MB 885-19628/1-A	Method Blank	Total/NA	Solid	8015M/D	19628
LCS 885-19628/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19628
885-18633-16 MS	BS25-08 0.5'	Total/NA	Solid	8015M/D	19628
885-18633-16 MSD	BS25-08 0.5'	Total/NA	Solid	8015M/D	19628

Analysis Batch: 19777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-16	BS25-08 0.5'	Total/NA	Solid	8021B	19628
885-18633-17	BS25-09 0.5'	Total/NA	Solid	8021B	19628
885-18633-18	BS25-10 0.5'	Total/NA	Solid	8021B	19628
885-18633-19	BS25-11 0.5'	Total/NA	Solid	8021B	19628
885-18633-20	BS25-12 0.5'	Total/NA	Solid	8021B	19628
885-18633-21	BS25-13 0.5'	Total/NA	Solid	8021B	19628
885-18633-22	BS25-14 0.5'	Total/NA	Solid	8021B	19628
885-18633-23	BS25-15 1'	Total/NA	Solid	8021B	19628
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	8021B	19628
885-18633-25	BS25-27 0.5'	Total/NA	Solid	8021B	19628
885-18633-26	BS25-28 0.5'	Total/NA	Solid	8021B	19628
885-18633-27	BS25-29 0.5'	Total/NA	Solid	8021B	19628
885-18633-28	BS25-30 0.5'	Total/NA	Solid	8021B	19628
885-18633-29	BS25-31 0.5'	Total/NA	Solid	8021B	19628
885-18633-30	BS25-32 0.5'	Total/NA	Solid	8021B	19628
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	8021B	19628
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	8021B	19628
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	8021B	19628
MB 885-19628/1-A	Method Blank	Total/NA	Solid	8021B	19628
LCS 885-19628/3-A	Lab Control Sample	Total/NA	Solid	8021B	19628
885-18633-17 MS	BS25-09 0.5'	Total/NA	Solid	8021B	19628
885-18633-17 MSD	BS25-09 0.5'	Total/NA	Solid	8021B	19628

GC Semi VOA

Prep Batch: 19620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	SHAKE	
885-18633-2	BS25-16 0.5'	Total/NA	Solid	SHAKE	
885-18633-3	BS25-17 0.5'	Total/NA	Solid	SHAKE	
885-18633-4	BS25-18 0.5'	Total/NA	Solid	SHAKE	
885-18633-5	BS25-19 0.5'	Total/NA	Solid	SHAKE	
885-18633-6	BS25-20 0.5'	Total/NA	Solid	SHAKE	
885-18633-7	BS25-21 0.5'	Total/NA	Solid	SHAKE	
885-18633-8	BS25-22 0.5'	Total/NA	Solid	SHAKE	
885-18633-9	BS25-23 0.5'	Total/NA	Solid	SHAKE	
885-18633-10	BS25-24 0.5'	Total/NA	Solid	SHAKE	

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

GC Semi VOA (Continued)

Prep Batch: 19620 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-11	BS25-25 0.5'	Total/NA	Solid	SHAKE	
885-18633-12	BS25-26 0.5'	Total/NA	Solid	SHAKE	
885-18633-13	BS25-05 0.5'	Total/NA	Solid	SHAKE	
885-18633-14	BS25-06 0.5'	Total/NA	Solid	SHAKE	
885-18633-15	BS25-07 0.5'	Total/NA	Solid	SHAKE	
MB 885-19620/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 885-19620/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
885-18633-A-12-C MS	885-18633-A-12-C MS	Total/NA	Solid	SHAKE	
885-18633-A-12-D MSD	885-18633-A-12-D MSD	Total/NA	Solid	SHAKE	

Analysis Batch: 19647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	8015M/D	19620
885-18633-2	BS25-16 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-3	BS25-17 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-4	BS25-18 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-5	BS25-19 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-6	BS25-20 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-7	BS25-21 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-8	BS25-22 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-9	BS25-23 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-10	BS25-24 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-11	BS25-25 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-12	BS25-26 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-13	BS25-05 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-14	BS25-06 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-15	BS25-07 0.5'	Total/NA	Solid	8015M/D	19620
885-18633-16	BS25-08 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-17	BS25-09 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-18	BS25-10 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-19	BS25-11 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-20	BS25-12 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-21	BS25-13 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-22	BS25-14 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-23	BS25-15 1'	Total/NA	Solid	8015M/D	19673
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	8015M/D	19673
885-18633-25	BS25-27 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-26	BS25-28 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-27	BS25-29 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-28	BS25-30 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-29	BS25-31 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-30	BS25-32 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	8015M/D	19673
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	8015M/D	19673
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	8015M/D	19673
MB 885-19620/1-A	Method Blank	Total/NA	Solid	8015M/D	19620
MB 885-19673/1-A	Method Blank	Total/NA	Solid	8015M/D	19673
LCS 885-19620/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19620
LCS 885-19673/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19673
885-18633-19 MS	BS25-11 0.5'	Total/NA	Solid	8015M/D	19673
885-18633-19 MSD	BS25-11 0.5'	Total/NA	Solid	8015M/D	19673

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

GC Semi VOA (Continued)

Analysis Batch: 19647 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-A-12-C MS	885-18633-A-12-C MS	Total/NA	Solid	8015M/D	19620
885-18633-A-12-D MSD	885-18633-A-12-D MSD	Total/NA	Solid	8015M/D	19620

Prep Batch: 19673

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-16	BS25-08 0.5'	Total/NA	Solid	SHAKE	
885-18633-17	BS25-09 0.5'	Total/NA	Solid	SHAKE	
885-18633-18	BS25-10 0.5'	Total/NA	Solid	SHAKE	
885-18633-19	BS25-11 0.5'	Total/NA	Solid	SHAKE	
885-18633-20	BS25-12 0.5'	Total/NA	Solid	SHAKE	
885-18633-21	BS25-13 0.5'	Total/NA	Solid	SHAKE	
885-18633-22	BS25-14 0.5'	Total/NA	Solid	SHAKE	
885-18633-23	BS25-15 1'	Total/NA	Solid	SHAKE	
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	SHAKE	
885-18633-25	BS25-27 0.5'	Total/NA	Solid	SHAKE	
885-18633-26	BS25-28 0.5'	Total/NA	Solid	SHAKE	
885-18633-27	BS25-29 0.5'	Total/NA	Solid	SHAKE	
885-18633-28	BS25-30 0.5'	Total/NA	Solid	SHAKE	
885-18633-29	BS25-31 0.5'	Total/NA	Solid	SHAKE	
885-18633-30	BS25-32 0.5'	Total/NA	Solid	SHAKE	
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	SHAKE	
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	SHAKE	
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	SHAKE	
MB 885-19673/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 885-19673/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
885-18633-19 MS	BS25-11 0.5'	Total/NA	Solid	SHAKE	
885-18633-19 MSD	BS25-11 0.5'	Total/NA	Solid	SHAKE	

HPLC/IC

Analysis Batch: 19608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	300.0	19616
885-18633-2	BS25-16 0.5'	Total/NA	Solid	300.0	19616
885-18633-3	BS25-17 0.5'	Total/NA	Solid	300.0	19616
885-18633-4	BS25-18 0.5'	Total/NA	Solid	300.0	19616
885-18633-5	BS25-19 0.5'	Total/NA	Solid	300.0	19616
885-18633-6	BS25-20 0.5'	Total/NA	Solid	300.0	19616
885-18633-7	BS25-21 0.5'	Total/NA	Solid	300.0	19616
885-18633-8	BS25-22 0.5'	Total/NA	Solid	300.0	19616
885-18633-9	BS25-23 0.5'	Total/NA	Solid	300.0	19616
885-18633-10	BS25-24 0.5'	Total/NA	Solid	300.0	19616
885-18633-11	BS25-25 0.5'	Total/NA	Solid	300.0	19616
885-18633-12	BS25-26 0.5'	Total/NA	Solid	300.0	19616
885-18633-13	BS25-05 0.5'	Total/NA	Solid	300.0	19616
885-18633-14	BS25-06 0.5'	Total/NA	Solid	300.0	19616
885-18633-15	BS25-07 0.5'	Total/NA	Solid	300.0	19616
885-18633-16	BS25-08 0.5'	Total/NA	Solid	300.0	19616
885-18633-17	BS25-09 0.5'	Total/NA	Solid	300.0	19616
885-18633-18	BS25-10 0.5'	Total/NA	Solid	300.0	19616
885-18633-19	BS25-11 0.5'	Total/NA	Solid	300.0	19616

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

HPLC/IC (Continued)

Analysis Batch: 19608 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 885-19616/1-A	Method Blank	Total/NA	Solid	300.0	19616
LCS 885-19616/2-A	Lab Control Sample	Total/NA	Solid	300.0	19616
885-18633-1 MS	WS25-05 0.5-1'	Total/NA	Solid	300.0	19616
885-18633-1 MSD	WS25-05 0.5-1'	Total/NA	Solid	300.0	19616
885-18633-2 MS	BS25-16 0.5'	Total/NA	Solid	300.0	19616
885-18633-2 MSD	BS25-16 0.5'	Total/NA	Solid	300.0	19616

Prep Batch: 19616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-1	WS25-05 0.5-1'	Total/NA	Solid	300_Prep	
885-18633-2	BS25-16 0.5'	Total/NA	Solid	300_Prep	
885-18633-3	BS25-17 0.5'	Total/NA	Solid	300_Prep	
885-18633-4	BS25-18 0.5'	Total/NA	Solid	300_Prep	
885-18633-5	BS25-19 0.5'	Total/NA	Solid	300_Prep	
885-18633-6	BS25-20 0.5'	Total/NA	Solid	300_Prep	
885-18633-7	BS25-21 0.5'	Total/NA	Solid	300_Prep	
885-18633-8	BS25-22 0.5'	Total/NA	Solid	300_Prep	
885-18633-9	BS25-23 0.5'	Total/NA	Solid	300_Prep	
885-18633-10	BS25-24 0.5'	Total/NA	Solid	300_Prep	
885-18633-11	BS25-25 0.5'	Total/NA	Solid	300_Prep	
885-18633-12	BS25-26 0.5'	Total/NA	Solid	300_Prep	
885-18633-13	BS25-05 0.5'	Total/NA	Solid	300_Prep	
885-18633-14	BS25-06 0.5'	Total/NA	Solid	300_Prep	
885-18633-15	BS25-07 0.5'	Total/NA	Solid	300_Prep	
885-18633-16	BS25-08 0.5'	Total/NA	Solid	300_Prep	
885-18633-17	BS25-09 0.5'	Total/NA	Solid	300_Prep	
885-18633-18	BS25-10 0.5'	Total/NA	Solid	300_Prep	
885-18633-19	BS25-11 0.5'	Total/NA	Solid	300_Prep	
MB 885-19616/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-19616/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	
885-18633-1 MS	WS25-05 0.5-1'	Total/NA	Solid	300_Prep	
885-18633-1 MSD	WS25-05 0.5-1'	Total/NA	Solid	300_Prep	
885-18633-2 MS	BS25-16 0.5'	Total/NA	Solid	300_Prep	
885-18633-2 MSD	BS25-16 0.5'	Total/NA	Solid	300_Prep	

Prep Batch: 19645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-20	BS25-12 0.5'	Total/NA	Solid	300_Prep	
885-18633-21	BS25-13 0.5'	Total/NA	Solid	300_Prep	
885-18633-22	BS25-14 0.5'	Total/NA	Solid	300_Prep	
885-18633-23	BS25-15 1'	Total/NA	Solid	300_Prep	
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	300_Prep	
885-18633-25	BS25-27 0.5'	Total/NA	Solid	300_Prep	
885-18633-26	BS25-28 0.5'	Total/NA	Solid	300_Prep	
885-18633-27	BS25-29 0.5'	Total/NA	Solid	300_Prep	
885-18633-28	BS25-30 0.5'	Total/NA	Solid	300_Prep	
885-18633-29	BS25-31 0.5'	Total/NA	Solid	300_Prep	
885-18633-30	BS25-32 0.5'	Total/NA	Solid	300_Prep	
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	300_Prep	
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	300_Prep	
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	300_Prep	

QC Association Summary

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18633-1

HPLC/IC (Continued)

Prep Batch: 19645 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 885-19645/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-19645/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Analysis Batch: 19646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18633-20	BS25-12 0.5'	Total/NA	Solid	300.0	19645
885-18633-21	BS25-13 0.5'	Total/NA	Solid	300.0	19645
885-18633-22	BS25-14 0.5'	Total/NA	Solid	300.0	19645
885-18633-23	BS25-15 1'	Total/NA	Solid	300.0	19645
885-18633-24	WS25-04 0-0.5'	Total/NA	Solid	300.0	19645
885-18633-25	BS25-27 0.5'	Total/NA	Solid	300.0	19645
885-18633-26	BS25-28 0.5'	Total/NA	Solid	300.0	19645
885-18633-27	BS25-29 0.5'	Total/NA	Solid	300.0	19645
885-18633-28	BS25-30 0.5'	Total/NA	Solid	300.0	19645
885-18633-29	BS25-31 0.5'	Total/NA	Solid	300.0	19645
885-18633-30	BS25-32 0.5'	Total/NA	Solid	300.0	19645
885-18633-31	WS25-01 0-0.5'	Total/NA	Solid	300.0	19645
885-18633-32	WS25-02 0-0.5'	Total/NA	Solid	300.0	19645
885-18633-33	WS25-03 0-0.5'	Total/NA	Solid	300.0	19645
MB 885-19645/1-A	Method Blank	Total/NA	Solid	300.0	19645
LCS 885-19645/2-A	Lab Control Sample	Total/NA	Solid	300.0	19645

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: WS25-05 0.5-1'
Lab Sample ID: 885-18633-1
Date Collected: 01/14/25 13:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 18:31
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 18:31
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 08:55
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 14:42

Client Sample ID: BS25-16 0.5'
Lab Sample ID: 885-18633-2
Date Collected: 01/15/25 09:45
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 19:42
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 19:42
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:05
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 15:13

Client Sample ID: BS25-17 0.5'
Lab Sample ID: 885-18633-3
Date Collected: 01/15/25 10:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 20:05
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 20:05
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:16
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 15:44

Client Sample ID: BS25-18 0.5'
Lab Sample ID: 885-18633-4
Date Collected: 01/15/25 10:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 20:29

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-18 0.5'
Lab Sample ID: 885-18633-4
Date Collected: 01/15/25 10:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 20:29
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:26
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 15:54

Client Sample ID: BS25-19 0.5'
Lab Sample ID: 885-18633-5
Date Collected: 01/15/25 11:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 20:53
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 20:53
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:37
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 16:25

Client Sample ID: BS25-20 0.5'
Lab Sample ID: 885-18633-6
Date Collected: 01/15/25 11:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 21:40
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 21:40
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:47
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 16:35

Client Sample ID: BS25-21 0.5'
Lab Sample ID: 885-18633-7
Date Collected: 01/15/25 12:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 22:04
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 22:04

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-21 0.5'
Lab Sample ID: 885-18633-7
Date Collected: 01/15/25 12:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 09:58
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 16:46

Client Sample ID: BS25-22 0.5'
Lab Sample ID: 885-18633-8
Date Collected: 01/15/25 12:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 22:27
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 22:27
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 10:09
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 16:56

Client Sample ID: BS25-23 0.5'
Lab Sample ID: 885-18633-9
Date Collected: 01/15/25 13:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 22:51
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 22:51
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 11:45
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:06

Client Sample ID: BS25-24 0.5'
Lab Sample ID: 885-18633-10
Date Collected: 01/15/25 13:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 23:14
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 23:14
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 11:56

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-24 0.5'
Lab Sample ID: 885-18633-10
Date Collected: 01/15/25 13:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:17

Client Sample ID: BS25-25 0.5'
Lab Sample ID: 885-18633-11
Date Collected: 01/15/25 14:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/22/25 23:38
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/22/25 23:38
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 12:07
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:27

Client Sample ID: BS25-26 0.5'
Lab Sample ID: 885-18633-12
Date Collected: 01/15/25 14:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/23/25 00:01
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 11:49
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/23/25 00:01
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 12:17
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:37

Client Sample ID: BS25-05 0.5'
Lab Sample ID: 885-18633-13
Date Collected: 01/14/25 08:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/23/25 00:25
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/23/25 00:25
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 12:49
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:48

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-06 0.5'
Lab Sample ID: 885-18633-14
Date Collected: 01/14/25 08:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/23/25 00:48
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/23/25 00:48
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 13:00
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 17:58

Client Sample ID: BS25-07 0.5'
Lab Sample ID: 885-18633-15
Date Collected: 01/14/25 09:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8015M/D		1	19680	JP	EET ALB	01/23/25 01:12
Total/NA	Prep	5030C			19612	AT	EET ALB	01/21/25 12:22
Total/NA	Analysis	8021B		1	19681	JP	EET ALB	01/23/25 01:12
Total/NA	Prep	SHAKE			19620	MI	EET ALB	01/21/25 13:17
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 13:11
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 18:29

Client Sample ID: BS25-08 0.5'
Lab Sample ID: 885-18633-16
Date Collected: 01/14/25 09:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 19:10
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 19:10
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 15:52
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 18:40

Client Sample ID: BS25-09 0.5'
Lab Sample ID: 885-18633-17
Date Collected: 01/14/25 10:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 20:16

Lab Chronicle

Client: Vertex Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-09 0.5' Lab Sample ID: 885-18633-17

Date Collected: 01/14/25 10:00 **Matrix: Solid**
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 20:16
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 16:03
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 18:50

Client Sample ID: BS25-10 0.5' Lab Sample ID: 885-18633-18

Date Collected: 01/14/25 10:30 **Matrix: Solid**
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 21:21
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 21:21
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 16:14
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 19:00

Client Sample ID: BS25-11 0.5' Lab Sample ID: 885-18633-19

Date Collected: 01/14/25 11:00 **Matrix: Solid**
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 21:42
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 21:42
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 16:24
Total/NA	Prep	300_Prep			19616	JT	EET ALB	01/21/25 12:49
Total/NA	Analysis	300.0		20	19608	JT	EET ALB	01/21/25 19:11

Client Sample ID: BS25-12 0.5' Lab Sample ID: 885-18633-20

Date Collected: 01/14/25 11:30 **Matrix: Solid**
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 22:04
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 22:04

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-12 0.5'
Lab Sample ID: 885-18633-20
Date Collected: 01/14/25 11:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 16:56
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 11:18

Client Sample ID: BS25-13 0.5'
Lab Sample ID: 885-18633-21
Date Collected: 01/14/25 12:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 22:26
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 22:26
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 17:18
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 11:28

Client Sample ID: BS25-14 0.5'
Lab Sample ID: 885-18633-22
Date Collected: 01/14/25 12:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 22:48
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 22:48
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 17:28
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 11:39

Client Sample ID: BS25-15 1'
Lab Sample ID: 885-18633-23
Date Collected: 01/14/25 13:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 23:09
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 23:09
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 17:39

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-15 1'
Lab Sample ID: 885-18633-23
Date Collected: 01/14/25 13:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 11:49

Client Sample ID: WS25-04 0-0.5'
Lab Sample ID: 885-18633-24
Date Collected: 01/14/25 13:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 23:31
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 23:31
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 17:49
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 11:59

Client Sample ID: BS25-27 0.5'
Lab Sample ID: 885-18633-25
Date Collected: 01/14/25 14:40
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/23/25 23:53
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/23/25 23:53
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:00
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 12:30

Client Sample ID: BS25-28 0.5'
Lab Sample ID: 885-18633-26
Date Collected: 01/15/25 14:50
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 00:37
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 00:37
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:10
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 12:41

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-29 0.5'
Lab Sample ID: 885-18633-27
Date Collected: 01/15/25 15:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 00:58
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 00:58
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:21
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 12:51

Client Sample ID: BS25-30 0.5'
Lab Sample ID: 885-18633-28
Date Collected: 01/15/25 15:10
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 01:20
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 01:20
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:31
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:01

Client Sample ID: BS25-31 0.5'
Lab Sample ID: 885-18633-29
Date Collected: 01/15/25 15:20
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 01:42
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 01:42
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:42
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:12

Client Sample ID: BS25-32 0.5'
Lab Sample ID: 885-18633-30
Date Collected: 01/15/25 15:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 02:03

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-32 0.5'
Lab Sample ID: 885-18633-30
Date Collected: 01/15/25 15:30
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 02:03
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 18:52
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:22

Client Sample ID: WS25-01 0-0.5'
Lab Sample ID: 885-18633-31
Date Collected: 01/15/25 15:40
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 02:25
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 02:25
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 19:13
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:33

Client Sample ID: WS25-02 0-0.5'
Lab Sample ID: 885-18633-32
Date Collected: 01/15/25 15:50
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 02:47
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 02:47
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 19:23
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:43

Client Sample ID: WS25-03 0-0.5'
Lab Sample ID: 885-18633-33
Date Collected: 01/15/25 16:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8015M/D		1	19776	JP	EET ALB	01/24/25 03:08
Total/NA	Prep	5030C			19628	AT	EET ALB	01/21/25 15:00
Total/NA	Analysis	8021B		1	19777	JP	EET ALB	01/24/25 03:08

Lab Chronicle

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: WS25-03 0-0.5'
Lab Sample ID: 885-18633-33

Date Collected: 01/15/25 16:00
Matrix: Solid
Date Received: 01/18/25 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE			19673	EM	EET ALB	01/22/25 10:56
Total/NA	Analysis	8015M/D		1	19647	MI	EET ALB	01/22/25 19:34
Total/NA	Prep	300_Prep			19645	RC	EET ALB	01/22/25 07:12
Total/NA	Analysis	300.0		20	19646	ES	EET ALB	01/22/25 13:53

Laboratory References:

EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Vertex
Job ID: 885-18633-1
Project/Site: Cranbrook State Com 1H

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
300.0	300_Prep	Solid	Chloride
8015M/D	5030C	Solid	Gasoline Range Organics [C6 - C10]
8015M/D	SHAKE	Solid	Diesel Range Organics [C10-C28]
8015M/D	SHAKE	Solid	Motor Oil Range Organics [C28-C40]
8021B	5030C	Solid	Benzene
8021B	5030C	Solid	Ethylbenzene
8021B	5030C	Solid	Toluene
8021B	5030C	Solid	Xylenes, Total

Oregon	NELAP	NM100001	02-25-25

Chain-of-Custody Record

Client: **Vertex (bill to Mack Energy)**

Mailing Address: 3101 Boyd Dr,
Carlsbad, NM, 88220

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:
Cranbrook State Com 1H

Project #:
24E-04970

Project Manager:
Sally Carttar
Scarttar@vertexresource.com

Sampler: J. Rewis
On Ice: ☒ Yes ☐ No
# of Coolers: 1 MOD
Cooler Temp(including CF): 2.4±0=2.4°C

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

885-18633 COC

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)					
01.14.25	13:30	Soil	WS25-05 0.5-1'	4oz Jar	ICE	1	x	x					x								
01.15.25	9:45	Soil	BS25-16 0.5'	4oz Jar	ICE	2	x	x					x								
01.15.25	10:00	Soil	BS25-17 0.5'	4oz Jar	ICE	3	x	x					x								
01.15.25	10:30	Soil	BS25-18 0.5'	4oz Jar	ICE	4	x	x					x								
01.15.25	11:00	Soil	BS25-19 0.5'	4oz Jar	ICE	5	x	x					x								
01.15.25	11:30	Soil	BS25-20 0.5'	4oz Jar	ICE	6	x	x					x								
01.15.25	12:00	Soil	BS25-21 0.5'	4oz Jar	ICE	7	x	x					x								
01.15.25	12:30	Soil	BS25-22 0.5'	4oz Jar	ICE	8	x	x					x								
01.15.25	13:00	Soil	BS25-23 0.5'	4oz Jar	ICE	9	x	x					x								
01.15.25	13:30	Soil	BS25-24 0.5'	4oz Jar	ICE	10	x	x					x								
01.15.25	14:00	Soil	BS25-25 0.5'	4oz Jar	ICE	11	x	x					x								
01.15.25	14:30	Soil	BS25-26 0.5'	4oz Jar	ICE	12	x	x					x								

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
1-16-25	945	John Rewis	[illegible]		1/17/25	945
1/17/25	900	[illegible]	SCM	COURIER	1/18/25	0815

Remarks:
Direct Bill to Mack Energy,
ATTN: Matt Buckles (Mack)
CC: Sally Carttar scarttar@vertexresource.com) 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 (bill to Mack Energy)**

Mailing Address: 3101 Boyd Dr, Carlsbad, NM, 88220

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: **Cranbrook State Com 1H**

Project #: **24E-04970**

Project Manager: **Sally Carttar**

Scarttar@vertexresource.com

Sampler: J. Rewis

On Ice: ☑ Yes ☐ No

# of Coolers: 1 MOJO

Cooler Temp(including CF): 2.4±0=2.4°C

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

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	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)
01.14.25	8:00	Soil	BS25-05 0.5'	4oz Jar	ICE	13	x	x					x			
01.14.25	8:30	Soil	BS25-06 0.5'	4oz Jar	ICE	14	x	x					x			
01.14.25	9:00	Soil	BS25-07 0.5'	4oz Jar	ICE	15	x	x					x			
01.14.25	9:30	Soil	BS25-08 0.5'	4oz Jar	ICE	16	x	x					x			
01.14.25	10:00	Soil	BS25-09 0.5'	4oz Jar	ICE	17	x	x					x			
01.14.25	10:30	Soil	BS25-10 0.5'	4oz Jar	ICE	18	x	x					x			
01.14.25	11:00	Soil	BS25-11 0.5'	4oz Jar	ICE	19	x	x					x			
01.14.25	11:30	Soil	BS25-12 0.5'	4oz Jar	ICE	20	x	x					x			
01.14.25	12:00	Soil	BS25-13 0.5'	4oz Jar	ICE	21	x	x					x			
01.14.25	12:30	Soil	BS25-14 0.5'	4oz Jar	ICE	22	x	x					x			
01.14.25	13:00	Soil	BS25-15 1'	4oz Jar	ICE	23	x	x					x			
01.14.25	13:30	Soil	WS25-04 0-0.5'	4oz Jar	ICE	24	x	x					x			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
1-16-25	945	John Rewis	CCummings		1/17/25	945
1/17/25	1900	CCummings	SCM	COURIER	1/18/25	0815

Remarks:
Direct Bill to Mack Energy,
ATTN: Matt Buckles (Mack)
CC: Sally Carttar scarttar@vertexresource.com) 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 (bill to Mack Energy)**

Mailing Address: 3101 Boyd Dr, Carlsbad, NM, 88220

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: **Cranbrook State Com 1H**

Project #: **24E-04970**

Project Manager: **Sally Carttar**

Scarttar@vertexresource.com

Sampler: J. Rewis

On Ice: ☑ Yes ☐ No

# of Coolers: 1 MOJO

Cooler Temp(including CF): 2.4±0 = 2.4°C

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

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	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)
01.14.25	14:40	Soil	BS25-27 0.5'	4oz Jar	ICE	25	x	x					x			
01.15.25	14:50	Soil	BS25-28 0.5'	4oz Jar	ICE	26	x	x					x			
01.15.25	15:00	Soil	BS25-29 0.5'	4oz Jar	ICE	27	x	x					x			
01.15.25	15:10	Soil	BS25-30 0.5'	4oz Jar	ICE	28	x	x					x			
01.15.25	15:20	Soil	BS25-31 0.5'	4oz Jar	ICE	29	x	x					x			
01.15.25	15:30	Soil	BS25-32 0.5'	4oz Jar	ICE	30	x	x					x			
01.15.25	15:40	Soil	WS25-01 0-0.5'	4oz Jar	ICE	31	x	x					x			
01.15.25	15:50	Soil	WS25-02 0-0.5'	4oz Jar	ICE	32	x	x					x			
01.15.25	16:00	Soil	WS25-03 0-0.5'	4oz Jar	ICE	33	x	x					x			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
1-17-25	945	John Rewis	[illegible]		1/17/25	945
1/17/25	1900	[illegible]	SCM	COURIER	1/18/25	0815

Remarks:
Direct Bill to Mack Energy,
ATTN: Matt Buckles (Mack)
CC: Sally Carttar scarttar@vertexresource.com) 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.

Login Sample Receipt Checklist

Client: Vertex Job Number: 885-18633-1

Login Number: 18633 **List Source: Eurofins Albuquerque**
List Number: 1
Creator: McQuiston, Steven

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
TCEQ Mtd 1005 soil sample was frozen/delivered for prep within 48H of sampling.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Sally Carttar
Vertex
3101 Boyd Dr
Carlsbad, New Mexico 88220

Generated 1/22/2025 4:28:30 PM

JOB DESCRIPTION

Cranbrook State Com 1H

JOB NUMBER

885-18360-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

See page two for job notes and contact information.

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization

Generated
1/22/2025 4:28:30 PM

Authorized for release by
Cheyenne Cason, Project Manager
cheyenne.cason@et.eurofinsus.com
(505)345-3975

Client: Vertex
Project/Site: Cranbrook State Com 1H

Laboratory Job ID: 885-18360-1

Table of Contents

Definitions/Glossary

Client: Vertex Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Vertex Job ID: 885-18360-1
Project: Cranbrook State Com 1H

Job ID: 885-18360-1 Eurofins Albuquerque

Job Narrative
885-18360-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 1/14/2025 3:25 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.5°C.

Gasoline Range Organics
Method 8015D_GRO: Surrogate recovery for the following samples is outside the upper control limit: (LCS 885-19357/2-A), (885-18360-A-1-B MS) and (885-18360-A-1-C MSD). There is evidence of matrix interference, therefore the results were reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015D_DRO: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 885-19473 and analytical batch 885-19471 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-01 0.5'
Lab Sample ID: 885-18360-1
Date Collected: 01/10/25 09:00
Matrix: Solid
Date Received: 01/14/25 15:25

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/15/25 10:56	01/20/25 12:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*35 - 166*	*01/15/25 10:56*	*01/20/25 12:25*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/15/25 10:56	01/17/25 21:48	1
Ethylbenzene	ND		0.049		mg/Kg		01/15/25 10:56	01/17/25 21:48	1
Toluene	ND		0.049		mg/Kg		01/15/25 10:56	01/17/25 21:48	1
Xylenes, Total	ND		0.098		mg/Kg		01/15/25 10:56	01/17/25 21:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*48 - 145*	*01/15/25 10:56*	*01/17/25 21:48*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.4		mg/Kg		01/17/25 09:17	01/17/25 11:49	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		01/17/25 09:17	01/17/25 11:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*95*		*62 - 134*	*01/17/25 09:17*	*01/17/25 11:49*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**290**		60		mg/Kg		01/15/25 12:08	01/15/25 16:09	20

Client Sample Results

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-02 0.5'
Lab Sample ID: 885-18360-2
Date Collected: 01/10/25 09:30
Matrix: Solid
Date Received: 01/14/25 15:25

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		01/15/25 10:56	01/20/25 12:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*35 - 166*	*01/15/25 10:56*	*01/20/25 12:48*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/15/25 10:56	01/17/25 23:00	1
Ethylbenzene	ND		0.049		mg/Kg		01/15/25 10:56	01/17/25 23:00	1
Toluene	ND		0.049		mg/Kg		01/15/25 10:56	01/17/25 23:00	1
Xylenes, Total	ND		0.099		mg/Kg		01/15/25 10:56	01/17/25 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*48 - 145*	*01/15/25 10:56*	*01/17/25 23:00*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.9		mg/Kg		01/17/25 09:17	01/17/25 12:00	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/17/25 09:17	01/17/25 12:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*93*		*62 - 134*	*01/17/25 09:17*	*01/17/25 12:00*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**96**		60		mg/Kg		01/15/25 12:08	01/15/25 16:38	20

Client Sample Results

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-03 0.5'
Lab Sample ID: 885-18360-3
Date Collected: 01/10/25 10:00
Matrix: Solid
Date Received: 01/14/25 15:25

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/15/25 10:56	01/20/25 13:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*35 - 166*	*01/15/25 10:56*	*01/20/25 13:12*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/15/25 10:56	01/18/25 00:10	1
Ethylbenzene	ND		0.048		mg/Kg		01/15/25 10:56	01/18/25 00:10	1
Toluene	ND		0.048		mg/Kg		01/15/25 10:56	01/18/25 00:10	1
Xylenes, Total	ND		0.097		mg/Kg		01/15/25 10:56	01/18/25 00:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*48 - 145*	*01/15/25 10:56*	*01/18/25 00:10*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**31**	**F1**	10		mg/Kg		01/17/25 09:17	01/17/25 12:10	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/17/25 09:17	01/17/25 12:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*94*		*62 - 134*	*01/17/25 09:17*	*01/17/25 12:10*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**84**		60		mg/Kg		01/15/25 12:08	01/15/25 16:48	20

Client Sample Results

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-04 0.5'
Lab Sample ID: 885-18360-4
Date Collected: 01/10/25 10:30
Matrix: Solid
Date Received: 01/14/25 15:25

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		01/15/25 10:56	01/20/25 13:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/15/25 10:56*	*01/20/25 13:36*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		01/15/25 10:56	01/18/25 00:34	1
Ethylbenzene	ND		0.048		mg/Kg		01/15/25 10:56	01/18/25 00:34	1
Toluene	ND		0.048		mg/Kg		01/15/25 10:56	01/18/25 00:34	1
Xylenes, Total	ND		0.097		mg/Kg		01/15/25 10:56	01/18/25 00:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*48 - 145*	*01/15/25 10:56*	*01/18/25 00:34*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		01/17/25 09:17	01/17/25 12:44	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		01/17/25 09:17	01/17/25 12:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*102*		*62 - 134*	*01/17/25 09:17*	*01/17/25 12:44*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**73**		60		mg/Kg		01/15/25 12:08	01/15/25 16:58	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18360-1

Method: 8015M/D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 885-19357/1-A
Matrix: Solid
Analysis Batch: 19535

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19357

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		01/15/25 10:56	01/20/25 12:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*35 - 166*	*01/15/25 10:56*	*01/20/25 12:01*	*1*

Lab Sample ID: LCS 885-19357/2-A
Matrix: Solid
Analysis Batch: 19535

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19357

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]			25.0	24.2		mg/Kg		97	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*203*		*35 - 166*

Lab Sample ID: 885-18360-1 MS
Matrix: Solid
Analysis Batch: 19535

Client Sample ID: BS25-01 0.5'
Prep Type: Total/NA
Prep Batch: 19357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]	ND		24.7	23.0		mg/Kg		93	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*203*		*35 - 166*

Lab Sample ID: 885-18360-1 MSD
Matrix: Solid
Analysis Batch: 19535

Client Sample ID: BS25-01 0.5'
Prep Type: Total/NA
Prep Batch: 19357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics [C6 - C10]	ND		24.9	22.7		mg/Kg		91	70 - 130	1	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*201*		*35 - 166*

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 885-19357/1-A
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19357

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		01/15/25 10:56	01/17/25 21:24	1
Ethylbenzene	ND		0.050		mg/Kg		01/15/25 10:56	01/17/25 21:24	1
Toluene	ND		0.050		mg/Kg		01/15/25 10:56	01/17/25 21:24	1

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18360-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: MB 885-19357/1-A
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19357

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		0.10		mg/Kg		01/15/25 10:56	01/17/25 21:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*48 - 145*	*01/15/25 10:56*	*01/17/25 21:24*	*1*

Lab Sample ID: LCS 885-19357/3-A
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19357

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			1.00	1.01		mg/Kg		101	70 - 130		
Ethylbenzene			1.00	1.04		mg/Kg		104	70 - 130		
m,p-Xylene			2.00	2.06		mg/Kg		103	70 - 130		
o-Xylene			1.00	1.02		mg/Kg		102	70 - 130		
Toluene			1.00	1.03		mg/Kg		103	70 - 130		
Xylenes, Total			3.00	3.09		mg/Kg		103	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*112*		*48 - 145*

Lab Sample ID: 885-18360-2 MS
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: BS25-02 0.5'
Prep Type: Total/NA
Prep Batch: 19357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene	ND		0.978	0.951		mg/Kg		97	70 - 130		
Ethylbenzene	ND		0.978	0.988		mg/Kg		101	70 - 130		
m,p-Xylene	ND		1.96	1.97		mg/Kg		101	70 - 130		
o-Xylene	ND		0.978	0.969		mg/Kg		99	70 - 130		
Toluene	ND		0.978	0.990		mg/Kg		101	70 - 130		
Xylenes, Total	ND		2.94	2.94		mg/Kg		100	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*

Lab Sample ID: 885-18360-2 MSD
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: BS25-02 0.5'
Prep Type: Total/NA
Prep Batch: 19357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		0.986	0.994		mg/Kg		101	70 - 130	4	20
Ethylbenzene	ND		0.986	1.03		mg/Kg		104	70 - 130	4	20
m,p-Xylene	ND		1.97	2.05		mg/Kg		104	70 - 130	4	20
o-Xylene	ND		0.986	0.997		mg/Kg		101	70 - 130	3	20
Toluene	ND		0.986	1.03		mg/Kg		104	70 - 130	4	20
Xylenes, Total	ND		2.96	3.04		mg/Kg		103	70 - 130	4	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18360-1

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: 885-18360-2 MSD
Matrix: Solid
Analysis Batch: 19508

Client Sample ID: BS25-02 0.5'
Prep Type: Total/NA
Prep Batch: 19357

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*108*		*48 - 145*

Method: 8015M/D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 885-19473/1-A
Matrix: Solid
Analysis Batch: 19471

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19473

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		10		mg/Kg		01/17/25 09:17	01/17/25 11:28	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		01/17/25 09:17	01/17/25 11:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Di-n-octyl phthalate (Surr)	*93*		*62 - 134*	*01/17/25 09:17*	*01/17/25 11:28*	*1*

Lab Sample ID: LCS 885-19473/2-A
Matrix: Solid
Analysis Batch: 19471

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19473

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]			50.0	47.0		mg/Kg		94	60 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Di-n-octyl phthalate (Surr)	*87*		*62 - 134*

Lab Sample ID: 885-18360-3 MS
Matrix: Solid
Analysis Batch: 19471

Client Sample ID: BS25-03 0.5'
Prep Type: Total/NA
Prep Batch: 19473

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10-C28]	31	F1	49.6	48.1	F1	mg/Kg		34	44 - 136		

Surrogate	MS %Recovery	MS Qualifier	Limits
Di-n-octyl phthalate (Surr)	*94*		*62 - 134*

Lab Sample ID: 885-18360-3 MSD
Matrix: Solid
Analysis Batch: 19471

Client Sample ID: BS25-03 0.5'
Prep Type: Total/NA
Prep Batch: 19473

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]	31	F1	48.8	47.4	F1	mg/Kg		33	44 - 136	1	32

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Di-n-octyl phthalate (Surr)	*94*		*62 - 134*

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-18360-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-19363/1-A
Matrix: Solid
Analysis Batch: 19342

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19363

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0		mg/Kg		01/15/25 12:08	01/15/25 15:00	1

Lab Sample ID: LCS 885-19363/2-A
Matrix: Solid
Analysis Batch: 19342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19363

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			30.0	28.1		mg/Kg		94	90 - 110		

QC Association Summary

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

GC VOA

Prep Batch: 19357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	5030C	
885-18360-2	BS25-02 0.5'	Total/NA	Solid	5030C	
885-18360-3	BS25-03 0.5'	Total/NA	Solid	5030C	
885-18360-4	BS25-04 0.5'	Total/NA	Solid	5030C	
MB 885-19357/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 885-19357/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCS 885-19357/3-A	Lab Control Sample	Total/NA	Solid	5030C	
885-18360-1 MS	BS25-01 0.5'	Total/NA	Solid	5030C	
885-18360-1 MSD	BS25-01 0.5'	Total/NA	Solid	5030C	
885-18360-2 MS	BS25-02 0.5'	Total/NA	Solid	5030C	
885-18360-2 MSD	BS25-02 0.5'	Total/NA	Solid	5030C	

Analysis Batch: 19508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	8021B	19357
885-18360-2	BS25-02 0.5'	Total/NA	Solid	8021B	19357
885-18360-3	BS25-03 0.5'	Total/NA	Solid	8021B	19357
885-18360-4	BS25-04 0.5'	Total/NA	Solid	8021B	19357
MB 885-19357/1-A	Method Blank	Total/NA	Solid	8021B	19357
LCS 885-19357/3-A	Lab Control Sample	Total/NA	Solid	8021B	19357
885-18360-2 MS	BS25-02 0.5'	Total/NA	Solid	8021B	19357
885-18360-2 MSD	BS25-02 0.5'	Total/NA	Solid	8021B	19357

Analysis Batch: 19535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	8015M/D	19357
885-18360-2	BS25-02 0.5'	Total/NA	Solid	8015M/D	19357
885-18360-3	BS25-03 0.5'	Total/NA	Solid	8015M/D	19357
885-18360-4	BS25-04 0.5'	Total/NA	Solid	8015M/D	19357
MB 885-19357/1-A	Method Blank	Total/NA	Solid	8015M/D	19357
LCS 885-19357/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19357
885-18360-1 MS	BS25-01 0.5'	Total/NA	Solid	8015M/D	19357
885-18360-1 MSD	BS25-01 0.5'	Total/NA	Solid	8015M/D	19357

GC Semi VOA

Analysis Batch: 19471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	8015M/D	19473
885-18360-2	BS25-02 0.5'	Total/NA	Solid	8015M/D	19473
885-18360-3	BS25-03 0.5'	Total/NA	Solid	8015M/D	19473
885-18360-4	BS25-04 0.5'	Total/NA	Solid	8015M/D	19473
MB 885-19473/1-A	Method Blank	Total/NA	Solid	8015M/D	19473
LCS 885-19473/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	19473
885-18360-3 MS	BS25-03 0.5'	Total/NA	Solid	8015M/D	19473
885-18360-3 MSD	BS25-03 0.5'	Total/NA	Solid	8015M/D	19473

Prep Batch: 19473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	SHAKE	
885-18360-2	BS25-02 0.5'	Total/NA	Solid	SHAKE	

QC Association Summary

Client: Vertex Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

GC Semi VOA (Continued)

Prep Batch: 19473 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-3	BS25-03 0.5'	Total/NA	Solid	SHAKE	
885-18360-4	BS25-04 0.5'	Total/NA	Solid	SHAKE	
MB 885-19473/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 885-19473/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
885-18360-3 MS	BS25-03 0.5'	Total/NA	Solid	SHAKE	
885-18360-3 MSD	BS25-03 0.5'	Total/NA	Solid	SHAKE	

HPLC/IC

Analysis Batch: 19342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	300.0	19363
885-18360-2	BS25-02 0.5'	Total/NA	Solid	300.0	19363
885-18360-3	BS25-03 0.5'	Total/NA	Solid	300.0	19363
885-18360-4	BS25-04 0.5'	Total/NA	Solid	300.0	19363
MB 885-19363/1-A	Method Blank	Total/NA	Solid	300.0	19363
LCS 885-19363/2-A	Lab Control Sample	Total/NA	Solid	300.0	19363

Prep Batch: 19363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-18360-1	BS25-01 0.5'	Total/NA	Solid	300_Prep	
885-18360-2	BS25-02 0.5'	Total/NA	Solid	300_Prep	
885-18360-3	BS25-03 0.5'	Total/NA	Solid	300_Prep	
885-18360-4	BS25-04 0.5'	Total/NA	Solid	300_Prep	
MB 885-19363/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-19363/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Lab Chronicle

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-01 0.5'
Lab Sample ID: 885-18360-1
Date Collected: 01/10/25 09:00
Matrix: Solid
Date Received: 01/14/25 15:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8015M/D		1	19535	JP	EET ALB	01/20/25 12:25
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8021B		1	19508	JP	EET ALB	01/17/25 21:48
Total/NA	Prep	SHAKE			19473	EM	EET ALB	01/17/25 09:17
Total/NA	Analysis	8015M/D		1	19471	EM	EET ALB	01/17/25 11:49
Total/NA	Prep	300_Prep			19363	JT	EET ALB	01/15/25 12:08
Total/NA	Analysis	300.0		20	19342	JT	EET ALB	01/15/25 16:09

Client Sample ID: BS25-02 0.5'
Lab Sample ID: 885-18360-2
Date Collected: 01/10/25 09:30
Matrix: Solid
Date Received: 01/14/25 15:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8015M/D		1	19535	JP	EET ALB	01/20/25 12:48
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8021B		1	19508	JP	EET ALB	01/17/25 23:00
Total/NA	Prep	SHAKE			19473	EM	EET ALB	01/17/25 09:17
Total/NA	Analysis	8015M/D		1	19471	EM	EET ALB	01/17/25 12:00
Total/NA	Prep	300_Prep			19363	JT	EET ALB	01/15/25 12:08
Total/NA	Analysis	300.0		20	19342	JT	EET ALB	01/15/25 16:38

Client Sample ID: BS25-03 0.5'
Lab Sample ID: 885-18360-3
Date Collected: 01/10/25 10:00
Matrix: Solid
Date Received: 01/14/25 15:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8015M/D		1	19535	JP	EET ALB	01/20/25 13:12
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8021B		1	19508	JP	EET ALB	01/18/25 00:10
Total/NA	Prep	SHAKE			19473	EM	EET ALB	01/17/25 09:17
Total/NA	Analysis	8015M/D		1	19471	EM	EET ALB	01/17/25 12:10
Total/NA	Prep	300_Prep			19363	JT	EET ALB	01/15/25 12:08
Total/NA	Analysis	300.0		20	19342	JT	EET ALB	01/15/25 16:48

Client Sample ID: BS25-04 0.5'
Lab Sample ID: 885-18360-4
Date Collected: 01/10/25 10:30
Matrix: Solid
Date Received: 01/14/25 15:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8015M/D		1	19535	JP	EET ALB	01/20/25 13:36

Lab Chronicle

Client: Vertex
Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BS25-04 0.5'
Lab Sample ID: 885-18360-4

Date Collected: 01/10/25 10:30
Matrix: Solid
Date Received: 01/14/25 15:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			19357	JP	EET ALB	01/15/25 10:56
Total/NA	Analysis	8021B		1	19508	JP	EET ALB	01/18/25 00:34
Total/NA	Prep	SHAKE			19473	EM	EET ALB	01/17/25 09:17
Total/NA	Analysis	8015M/D		1	19471	EM	EET ALB	01/17/25 12:44
Total/NA	Prep	300_Prep			19363	JT	EET ALB	01/15/25 12:08
Total/NA	Analysis	300.0		20	19342	JT	EET ALB	01/15/25 16:58

Laboratory References:

EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Vertex Job ID: 885-18360-1
Project/Site: Cranbrook State Com 1H

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
300.0	300_Prep	Solid	Chloride
8015M/D	5030C	Solid	Gasoline Range Organics [C6 - C10]
8015M/D	SHAKE	Solid	Diesel Range Organics [C10-C28]
8015M/D	SHAKE	Solid	Motor Oil Range Organics [C28-C40]
8021B	5030C	Solid	Benzene
8021B	5030C	Solid	Ethylbenzene
8021B	5030C	Solid	Toluene
8021B	5030C	Solid	Xylenes, Total

Oregon	NELAP	NM100001	02-25-25

Chain-of-Custody Record

885-18360 COC

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

Client: **Vertex (bill to Mack)**

Mailing Address: 3101 Boyd Dr, Carlsbad, NM, 88220

Phone #: 575 725-5001

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: **Cranbrook State Com 1H**

Project #: **24E-04970**

Project Manager: **Sally Carttar**

Scarttar@vertexresource.com

Sampler: K. Taylor

On Ice: ☒ Yes ☐ No

# of Coolers: 1 MOJO

Cooler Temp(including CF): 3.3+0.2=3.5°C

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)
01.10.25	9:00	Soil	BS25-01 0.5'	4oz Jar	ICE		x	x					x			
01.10.25	9:30	Soil	BS25-02 0.5'	4oz Jar	ICE		x	x					x			
01.10.25	10:00	Soil	BS25-03 0.5'	4oz Jar	ICE		x	x					x			
01.10.25	10:30	Soil	BS25-04 0.5'	4oz Jar	ICE		x	x					x			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
1/13/25	1015	Katrina Taylor			1/13/25	1015
1/13/25	1900		SCM	CARRIER	1/14/25	1525

Remarks:
Direct Bill to Mack Energy,
ATTN: Matt Buckles (mattbuckles@mec.com)
CC: Katrina.Taylor@vertex.ca and Sally Carttar (Scarttar@vertexresource.com) 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.

Login Sample Receipt Checklist

Client: Vertex Job Number: 885-18360-1

Login Number: 18360 **List Source: Eurofins Albuquerque**
List Number: 1
Creator: Casarrubias, Tracy

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
TCEQ Mtd 1005 soil sample was frozen/delivered for prep within 48H of sampling.	True	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Sally Carttar
Vertex
3101 Boyd Dr
Carlsbad, New Mexico 88220

Generated 12/11/2024 12:23:33 PM

JOB DESCRIPTION

Cranbrook State Com 1H

JOB NUMBER

885-16360-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

See page two for job notes and contact information.

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization

Generated
12/11/2024 12:23:33 PM

Authorized for release by
Cheyenne Cason, Project Manager
cheyenne.cason@et.eurofinsus.com
(505)345-3975

Client: Vertex
Project/Site: Cranbrook State Com 1H

Laboratory Job ID: 885-16360-1

Table of Contents

Definitions/Glossary

Client: Vertex Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Vertex Job ID: 885-16360-1
Project: Cranbrook State Com 1H

Job ID: 885-16360-1 Eurofins Albuquerque

Job Narrative
885-16360-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 12/5/2024 8:20 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.6°C.

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015D_DRO: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 885-17206 and analytical batch 885-17280 recovered outside control limits for the surrogate: Di-n-octyl phthalate (Surr). The surrogate was biased high in the LCS and were not biased high in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-12 0'
Lab Sample ID: 885-16360-1
Date Collected: 12/02/24 09:00
Matrix: Solid
Date Received: 12/05/24 08:20

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		12/05/24 12:59	12/06/24 21:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*35 - 166*	*12/05/24 12:59*	*12/06/24 21:44*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		12/05/24 12:59	12/06/24 21:44	1
Ethylbenzene	ND		0.049		mg/Kg		12/05/24 12:59	12/06/24 21:44	1
Toluene	ND		0.049		mg/Kg		12/05/24 12:59	12/06/24 21:44	1
Xylenes, Total	ND		0.098		mg/Kg		12/05/24 12:59	12/06/24 21:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*	*12/05/24 12:59*	*12/06/24 21:44*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		10		mg/Kg		12/06/24 13:28	12/09/24 12:22	1
Motor Oil Range Organics [C28-C40]	ND		50		mg/Kg		12/06/24 13:28	12/09/24 12:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*95*		*62 - 134*	*12/06/24 13:28*	*12/09/24 12:22*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**300**		60		mg/Kg		12/05/24 14:25	12/05/24 16:36	20

Client Sample Results

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-13 0'
Lab Sample ID: 885-16360-2
Date Collected: 12/02/24 09:30
Matrix: Solid
Date Received: 12/05/24 08:20

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		12/05/24 12:59	12/06/24 22:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*79*		*35 - 166*	*12/05/24 12:59*	*12/06/24 22:06*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		12/05/24 12:59	12/06/24 22:06	1
Ethylbenzene	ND		0.048		mg/Kg		12/05/24 12:59	12/06/24 22:06	1
Toluene	ND		0.048		mg/Kg		12/05/24 12:59	12/06/24 22:06	1
Xylenes, Total	ND		0.097		mg/Kg		12/05/24 12:59	12/06/24 22:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*48 - 145*	*12/05/24 12:59*	*12/06/24 22:06*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**41**		9.7		mg/Kg		12/06/24 13:28	12/09/24 12:33	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		12/06/24 13:28	12/09/24 12:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*80*		*62 - 134*	*12/06/24 13:28*	*12/09/24 12:33*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**64**		60		mg/Kg		12/05/24 14:25	12/05/24 17:05	20

Client Sample Results

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-03 0'
Lab Sample ID: 885-16360-3
Date Collected: 12/03/24 09:00
Matrix: Solid
Date Received: 12/05/24 08:20

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.8		mg/Kg		12/05/24 12:59	12/06/24 22:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*35 - 166*	*12/05/24 12:59*	*12/06/24 22:28*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		12/05/24 12:59	12/06/24 22:28	1
Ethylbenzene	ND		0.048		mg/Kg		12/05/24 12:59	12/06/24 22:28	1
Toluene	ND		0.048		mg/Kg		12/05/24 12:59	12/06/24 22:28	1
Xylenes, Total	ND		0.096		mg/Kg		12/05/24 12:59	12/06/24 22:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*12/05/24 12:59*	*12/06/24 22:28*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.2		mg/Kg		12/06/24 13:28	12/09/24 12:43	1
Motor Oil Range Organics [C28-C40]	ND		46		mg/Kg		12/06/24 13:28	12/09/24 12:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*75*		*62 - 134*	*12/06/24 13:28*	*12/09/24 12:43*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**590**		60		mg/Kg		12/05/24 14:25	12/05/24 17:35	20

Client Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16360-1

Client Sample ID: BH24-03 4'

Date Collected: 12/03/24 09:30
Date Received: 12/05/24 08:20

Lab Sample ID: 885-16360-4

Matrix: Solid

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.7		mg/Kg		12/05/24 12:59	12/06/24 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*80*		*35 - 166*	*12/05/24 12:59*	*12/06/24 22:49*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		12/05/24 12:59	12/06/24 22:49	1
Ethylbenzene	ND		0.047		mg/Kg		12/05/24 12:59	12/06/24 22:49	1
Toluene	ND		0.047		mg/Kg		12/05/24 12:59	12/06/24 22:49	1
Xylenes, Total	ND		0.093		mg/Kg		12/05/24 12:59	12/06/24 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*48 - 145*	*12/05/24 12:59*	*12/06/24 22:49*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.3		mg/Kg		12/06/24 13:28	12/09/24 12:54	1
Motor Oil Range Organics [C28-C40]	ND		47		mg/Kg		12/06/24 13:28	12/09/24 12:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*88*		*62 - 134*	*12/06/24 13:28*	*12/09/24 12:54*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**73**		60		mg/Kg		12/05/24 14:25	12/05/24 17:45	20

Client Sample Results

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-04 0'
Lab Sample ID: 885-16360-5
Date Collected: 12/03/24 10:00
Matrix: Solid
Date Received: 12/05/24 08:20

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.9		mg/Kg		12/05/24 12:59	12/06/24 23:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*84*		*35 - 166*	*12/05/24 12:59*	*12/06/24 23:33*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.024		mg/Kg		12/05/24 12:59	12/06/24 23:33	1
Ethylbenzene	ND		0.049		mg/Kg		12/05/24 12:59	12/06/24 23:33	1
Toluene	ND		0.049		mg/Kg		12/05/24 12:59	12/06/24 23:33	1
Xylenes, Total	ND		0.097		mg/Kg		12/05/24 12:59	12/06/24 23:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*48 - 145*	*12/05/24 12:59*	*12/06/24 23:33*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.7		mg/Kg		12/06/24 13:28	12/09/24 13:05	1
Motor Oil Range Organics [C28-C40]	ND		49		mg/Kg		12/06/24 13:28	12/09/24 13:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*67*		*62 - 134*	*12/06/24 13:28*	*12/09/24 13:05*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**440**		60		mg/Kg		12/05/24 14:25	12/05/24 18:14	20

Client Sample Results

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-04 4'
Lab Sample ID: 885-16360-6
Date Collected: 12/03/24 10:30
Matrix: Solid
Date Received: 12/05/24 08:20

Method: SW846 8015M/D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		4.6		mg/Kg		12/05/24 12:59	12/06/24 23:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*35 - 166*	*12/05/24 12:59*	*12/06/24 23:54*	*1*

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg		12/05/24 12:59	12/06/24 23:54	1
Ethylbenzene	ND		0.046		mg/Kg		12/05/24 12:59	12/06/24 23:54	1
Toluene	ND		0.046		mg/Kg		12/05/24 12:59	12/06/24 23:54	1
Xylenes, Total	ND		0.093		mg/Kg		12/05/24 12:59	12/06/24 23:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*48 - 145*	*12/05/24 12:59*	*12/06/24 23:54*	*1*

Method: SW846 8015M/D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	ND		9.7		mg/Kg		12/06/24 13:28	12/09/24 13:16	1
Motor Oil Range Organics [C28-C40]	ND		48		mg/Kg		12/06/24 13:28	12/09/24 13:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Di-n-octyl phthalate (Surr)	*97*		*62 - 134*	*12/06/24 13:28*	*12/09/24 13:16*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**67**		60		mg/Kg		12/05/24 14:25	12/05/24 18:24	20

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16360-1

Method: 8015M/D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 885-17098/1-A
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17098

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		5.0		mg/Kg		12/05/24 11:26	12/06/24 17:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*35 - 166*	*12/05/24 11:26*	*12/06/24 17:45*	*1*

Lab Sample ID: LCS 885-17098/2-A
Matrix: Solid
Analysis Batch: 17251

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17098

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]			25.0	19.9		mg/Kg		80	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*170*		*35 - 166*

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 885-17098/1-A
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17098

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.025		mg/Kg		12/05/24 11:26	12/06/24 17:45	1
Ethylbenzene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 17:45	1
Toluene	ND		0.050		mg/Kg		12/05/24 11:26	12/06/24 17:45	1
Xylenes, Total	ND		0.10		mg/Kg		12/05/24 11:26	12/06/24 17:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*48 - 145*	*12/05/24 11:26*	*12/06/24 17:45*	*1*

Lab Sample ID: LCS 885-17098/3-A
Matrix: Solid
Analysis Batch: 17252

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17098

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			1.00	0.968		mg/Kg		97	70 - 130		
Ethylbenzene			1.00	0.990		mg/Kg		99	70 - 130		
m,p-Xylene			2.00	1.96		mg/Kg		98	70 - 130		
o-Xylene			1.00	0.982		mg/Kg		98	70 - 130		
Toluene			1.00	0.974		mg/Kg		97	70 - 130		
Xylenes, Total			3.00	2.94		mg/Kg		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*96*		*48 - 145*

QC Sample Results

Client: Vertex
Project/Site: Cranbrook State Com 1H

Job ID: 885-16360-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-17129/1-A
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17129

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0		mg/Kg		12/05/24 14:25	12/05/24 16:16	1

Lab Sample ID: LCS 885-17129/2-A
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17129

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			30.0	28.4		mg/Kg		95	90 - 110		

Lab Sample ID: 885-16360-1 MS
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: BH24-12 0'
Prep Type: Total/NA
Prep Batch: 17129

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	300		29.8	337	4	mg/Kg		129	50 - 150		

Lab Sample ID: 885-16360-1 MSD
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: BH24-12 0'
Prep Type: Total/NA
Prep Batch: 17129

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	300		30.0	335	4	mg/Kg		121	50 - 150	1	20

Lab Sample ID: 885-16360-2 MS
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: BH24-13 0'
Prep Type: Total/NA
Prep Batch: 17129

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	64		30.2	86.4		mg/Kg		74	50 - 150		

Lab Sample ID: 885-16360-2 MSD
Matrix: Solid
Analysis Batch: 17068

Client Sample ID: BH24-13 0'
Prep Type: Total/NA
Prep Batch: 17129

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	64		30.0	87.9		mg/Kg		80	50 - 150	2	20

QC Association Summary

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

GC VOA

Prep Batch: 17098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	5030C	
885-16360-2	BH24-13 0'	Total/NA	Solid	5030C	
885-16360-3	BH24-03 0'	Total/NA	Solid	5030C	
885-16360-4	BH24-03 4'	Total/NA	Solid	5030C	
885-16360-5	BH24-04 0'	Total/NA	Solid	5030C	
885-16360-6	BH24-04 4'	Total/NA	Solid	5030C	
MB 885-17098/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 885-17098/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCS 885-17098/3-A	Lab Control Sample	Total/NA	Solid	5030C	

Analysis Batch: 17251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	8015M/D	17098
885-16360-2	BH24-13 0'	Total/NA	Solid	8015M/D	17098
885-16360-3	BH24-03 0'	Total/NA	Solid	8015M/D	17098
885-16360-4	BH24-03 4'	Total/NA	Solid	8015M/D	17098
885-16360-5	BH24-04 0'	Total/NA	Solid	8015M/D	17098
885-16360-6	BH24-04 4'	Total/NA	Solid	8015M/D	17098
MB 885-17098/1-A	Method Blank	Total/NA	Solid	8015M/D	17098
LCS 885-17098/2-A	Lab Control Sample	Total/NA	Solid	8015M/D	17098

Analysis Batch: 17252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	8021B	17098
885-16360-2	BH24-13 0'	Total/NA	Solid	8021B	17098
885-16360-3	BH24-03 0'	Total/NA	Solid	8021B	17098
885-16360-4	BH24-03 4'	Total/NA	Solid	8021B	17098
885-16360-5	BH24-04 0'	Total/NA	Solid	8021B	17098
885-16360-6	BH24-04 4'	Total/NA	Solid	8021B	17098
MB 885-17098/1-A	Method Blank	Total/NA	Solid	8021B	17098
LCS 885-17098/3-A	Lab Control Sample	Total/NA	Solid	8021B	17098

GC Semi VOA

Prep Batch: 17206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	SHAKE	
885-16360-2	BH24-13 0'	Total/NA	Solid	SHAKE	
885-16360-3	BH24-03 0'	Total/NA	Solid	SHAKE	
885-16360-4	BH24-03 4'	Total/NA	Solid	SHAKE	
885-16360-5	BH24-04 0'	Total/NA	Solid	SHAKE	
885-16360-6	BH24-04 4'	Total/NA	Solid	SHAKE	

Analysis Batch: 17280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	8015M/D	17206
885-16360-2	BH24-13 0'	Total/NA	Solid	8015M/D	17206
885-16360-3	BH24-03 0'	Total/NA	Solid	8015M/D	17206
885-16360-4	BH24-03 4'	Total/NA	Solid	8015M/D	17206
885-16360-5	BH24-04 0'	Total/NA	Solid	8015M/D	17206
885-16360-6	BH24-04 4'	Total/NA	Solid	8015M/D	17206

QC Association Summary

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

HPLC/IC

Analysis Batch: 17068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	300.0	17129
885-16360-2	BH24-13 0'	Total/NA	Solid	300.0	17129
885-16360-3	BH24-03 0'	Total/NA	Solid	300.0	17129
885-16360-4	BH24-03 4'	Total/NA	Solid	300.0	17129
885-16360-5	BH24-04 0'	Total/NA	Solid	300.0	17129
885-16360-6	BH24-04 4'	Total/NA	Solid	300.0	17129
MB 885-17129/1-A	Method Blank	Total/NA	Solid	300.0	17129
LCS 885-17129/2-A	Lab Control Sample	Total/NA	Solid	300.0	17129
885-16360-1 MS	BH24-12 0'	Total/NA	Solid	300.0	17129
885-16360-1 MSD	BH24-12 0'	Total/NA	Solid	300.0	17129
885-16360-2 MS	BH24-13 0'	Total/NA	Solid	300.0	17129
885-16360-2 MSD	BH24-13 0'	Total/NA	Solid	300.0	17129

Prep Batch: 17129

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-16360-1	BH24-12 0'	Total/NA	Solid	300_Prep	
885-16360-2	BH24-13 0'	Total/NA	Solid	300_Prep	
885-16360-3	BH24-03 0'	Total/NA	Solid	300_Prep	
885-16360-4	BH24-03 4'	Total/NA	Solid	300_Prep	
885-16360-5	BH24-04 0'	Total/NA	Solid	300_Prep	
885-16360-6	BH24-04 4'	Total/NA	Solid	300_Prep	
MB 885-17129/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-17129/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	
885-16360-1 MS	BH24-12 0'	Total/NA	Solid	300_Prep	
885-16360-1 MSD	BH24-12 0'	Total/NA	Solid	300_Prep	
885-16360-2 MS	BH24-13 0'	Total/NA	Solid	300_Prep	
885-16360-2 MSD	BH24-13 0'	Total/NA	Solid	300_Prep	

Lab Chronicle

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-12 0'
Lab Sample ID: 885-16360-1
Date Collected: 12/02/24 09:00
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 21:44
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 21:44
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 12:22
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 16:36

Client Sample ID: BH24-13 0'
Lab Sample ID: 885-16360-2
Date Collected: 12/02/24 09:30
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 22:06
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 22:06
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 12:33
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 17:05

Client Sample ID: BH24-03 0'
Lab Sample ID: 885-16360-3
Date Collected: 12/03/24 09:00
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 22:28
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 22:28
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 12:43
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 17:35

Client Sample ID: BH24-03 4'
Lab Sample ID: 885-16360-4
Date Collected: 12/03/24 09:30
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 22:49

Lab Chronicle

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Client Sample ID: BH24-03 4'
Lab Sample ID: 885-16360-4
Date Collected: 12/03/24 09:30
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 22:49
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 12:54
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 17:45

Client Sample ID: BH24-04 0'
Lab Sample ID: 885-16360-5
Date Collected: 12/03/24 10:00
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 23:33
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 23:33
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 13:05
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 18:14

Client Sample ID: BH24-04 4'
Lab Sample ID: 885-16360-6
Date Collected: 12/03/24 10:30
Matrix: Solid
Date Received: 12/05/24 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8015M/D		1	17251	AT	EET ALB	12/06/24 23:54
Total/NA	Prep	5030C			17098	AT	EET ALB	12/05/24 12:59
Total/NA	Analysis	8021B		1	17252	AT	EET ALB	12/06/24 23:54
Total/NA	Prep	SHAKE			17206	MI	EET ALB	12/06/24 13:28
Total/NA	Analysis	8015M/D		1	17280	MI	EET ALB	12/09/24 13:16
Total/NA	Prep	300_Prep			17129	EH	EET ALB	12/05/24 14:25
Total/NA	Analysis	300.0		20	17068	ES	EET ALB	12/05/24 18:24

Laboratory References:

EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Vertex
Job ID: 885-16360-1
Project/Site: Cranbrook State Com 1H

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
300.0	300_Prep	Solid	Chloride
8015M/D	5030C	Solid	Gasoline Range Organics [C6 - C10]
8015M/D	SHAKE	Solid	Diesel Range Organics [C10-C28]
8015M/D	SHAKE	Solid	Motor Oil Range Organics [C28-C40]
8021B	5030C	Solid	Benzene
8021B	5030C	Solid	Ethylbenzene
8021B	5030C	Solid	Toluene
8021B	5030C	Solid	Xylenes, Total

Oregon	NELAP	NM100001	02-25-25

Chain-of-Custody Record

Client: Vertex
bill to Mack Energy (on file)
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 rush
Project Name: Cranbrook state Com 1H
Project #: 24E-04970
Project Manager: Sally Carttar
SCarttar@vertexresource.com
Sampler:
On Ice: ☒ Yes ☐ No
# of Coolers: 1 409:
Cooler Temp(including CF): 0.2+0.3=0.6 (°C)

HALL ENVIRONMENTAL ANALYSIS LABO
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87
Tel. 505-345-3975 Fax 505-345-410
885-16360 COC

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)
12/2	9:00	Soil	BH24-12 01'	4oz	Ice		X	X					X			
12/2	9:30		BH24-13 01'													
12/3	9:00		BH24-03 01'													
	9:30		BH24-03 4'													
	10:00		BH24-04 01'													
	10:30		BH24-04 4'													

Date	Time	Relinquished by	Received by	Via	Date	Time
12/4	9:00	Katrina Taylor			12/4/24	900
12/4/24	1900			Courier	12/5/24	8:20

Remarks:
Direct bill to Mack Energy ATTN: Matt Bu
CC Sally Carttar (SCarttar@vertexresource.com)
& Katrina.Taylor@vertexresource

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

Login Sample Receipt Checklist

Client: Vertex Job Number: 885-16360-1

Login Number: 16360 **List Source: Eurofins Albuquerque**
List Number: 1
Creator: Rojas, Juan

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
TCEQ Mtd 1005 soil sample was frozen/delivered for prep within 48H of sampling.	N/A	

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

QUESTIONS

Action 451594

QUESTIONS

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAPP2432462960**
Incident Name	**NAPP2432462960 CRANBROOK STATE COM 1H @ 30-005-64360**
Incident Type	**Oil Release**
Incident Status	**Remediation Closure Report Received**
Incident Well	**[30-005-64360] CRANBROOK STATE COM #001H**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	CRANBROOK STATE COM 1H
Date Release Discovered	11/19/2024
Surface Owner	State

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

Nature and Volume of Release	
Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.	
Crude Oil Released (bbls) Details	Cause: Human Error | Dump Line | Crude Oil | Released: 11 BBL | Recovered: 0 BBL | Lost: 11 BBL.
Produced Water Released (bbls) Details	*Not answered.*
Is the concentration of chloride in the produced water >10,000 mg/l	No
Condensate Released (bbls) Details	*Not answered.*
Natural Gas Vented (Mcf) Details	*Not answered.*
Natural Gas Flared (Mcf) Details	*Not answered.*
Other Released Details	*Not answered.*
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	Truck overflowed while loading crude off the tank.

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QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

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

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

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

I hereby agree and sign off to the above statement	Name: Sally Carttar Title: Consultant Email: scarttar@vertex.ca Date: 12/02/2024

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QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Site Characterization	
Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
What is the shallowest depth to groundwater beneath the area affected by the release in feet below ground surface (ft bgs)	Between 26 and 50 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Between ½ and 1 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 1 and 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Greater than 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Greater than 5 (mi.)
Any other fresh water well or spring	Greater than 5 (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 1 and 100 (ft.)
A subsurface mine	Between 1 and 5 (mi.)
An (non-karst) unstable area	Between 300 and 500 (ft.)
Categorize the risk of this well / site being in a karst geology	Medium
A 100-year floodplain	Between 1 and 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan		
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.		
Requesting a remediation plan approval with this submission		Yes
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.		
Have the lateral and vertical extents of contamination been fully delineated		Yes
Was this release entirely contained within a lined containment area		No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)		
Chloride	(EPA 300.0 or SM4500 Cl B)	1600
TPH (GRO+DRO+MRO)	(EPA SW-846 Method 8015M)	41
GRO+DRO	(EPA SW-846 Method 8015M)	41
BTEX	(EPA SW-846 Method 8021B or 8260B)	0
Benzene	(EPA SW-846 Method 8021B or 8260B)	0
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.		
On what estimated date will the remediation commence		01/08/2025
On what date will (or did) the final sampling or liner inspection occur		01/15/2025
On what date will (or was) the remediation complete(d)		01/15/2025
What is the estimated surface area (in square feet) that will be reclaimed		5731
What is the estimated volume (in cubic yards) that will be reclaimed		109
What is the estimated surface area (in square feet) that will be remediated		5731
What is the estimated volume (in cubic yards) that will be remediated		109
These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.		
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.		

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QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Remediation Plan (continued)	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
(Select all answers below that apply.)	
(Ex Situ) Excavation and **off-site** disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for **off-site** disposal	HALFWAY DISPOSAL AND LANDFILL [fEEM0112334510]
OR which OCD approved well (API) will be used for **off-site** disposal	*Not answered.*
OR is the **off-site** disposal site, to be used, out-of-state	*Not answered.*
OR is the **off-site** disposal site, to be used, an NMED facility	*Not answered.*
(Ex Situ) Excavation and **on-site** remediation (i.e. On-Site Land Farms)	*Not answered.*
(In Situ) Soil Vapor Extraction	*Not answered.*
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	*Not answered.*
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	*Not answered.*
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	*Not answered.*
Ground Water Abatement pursuant to 19.15.30 NMAC	*Not answered.*
OTHER (Non-listed remedial process)	*Not answered.*
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
I hereby agree and sign off to the above statement	Name: Sally Carttar Title: Consultant Email: scarttar@vertex.ca Date: 04/14/2025
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

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

QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

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

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QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	**422384**
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	**01/23/2025**
What was the (estimated) number of samples that were to be gathered	**30**
What was the sampling surface area in square feet	**6125**

Remediation Closure Request	
Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.	
Requesting a remediation closure approval with this submission	Yes
Have the lateral and vertical extents of contamination been fully delineated	**Yes**
Was this release entirely contained within a lined containment area	**No**
All areas reasonably needed for production or subsequent drilling operations have been stabilized, returned to the sites existing grade, and have a soil cover that prevents ponding of water, minimizing dust and erosion	Yes
What was the total surface area (in square feet) remediated	5731
What was the total volume (cubic yards) remediated	109
All areas not reasonably needed for production or subsequent drilling operations have been reclaimed to contain a minimum of four feet of non-waste contain earthen material with concentrations less than 600 mg/kg chlorides, 100 mg/kg TPH, 50 mg/kg BTEX, and 10 mg/kg Benzene	Yes
What was the total surface area (in square feet) reclaimed	5731
What was the total volume (in cubic yards) reclaimed	109
Summarize any additional remediation activities not included by answers (above)	As detailed in attached closure report

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

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

I hereby agree and sign off to the above statement	Name: Sally Carttar Title: Consultant Email: scarttar@vertex.ca Date: 04/14/2025

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QUESTIONS (continued)

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

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

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CONDITIONS

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 451594
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created By	Condition	Condition Date
nvelez	None	6/26/2025