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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Release Notification

Responsible Party

Responsible Party Marathon Oil Permian LLC	OGRID 372098
Contact Name Melodie Sanjari	Contact Telephone 575-988-8753
Contact email msanjari@marathonoil.com	Incident # *(assigned by OCD)*
Contact mailing address 4111 S. Tidwell Rd., Carlsbad, NM 8220	

Location of Release Source

Latitude 32.3995934 Longitude -103.5867087
(NAD 83 in decimal degrees to 5 decimal places)

Site Name CHILI PARLOR 17 FED TB	Site Type Oil & Gas Facility
Date Release Discovered: 4/22/2023	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
P	08	22S	33E	Lea

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

Nature and Volume of Release

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

☒ Crude Oil	Volume Released (bbls) ignited/0.03	Volume Recovered (bbls) ignited
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release
The bridal to LSHH was plugged, causing fluid in the flare line to not reach the tuning fork, which then sent it to the flare. As a result, a ~2200 square foot area around the flare and edge of the location were scorched. Characterization of impact is ongoing.

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Page 2

State of New Mexico
Oil Conservation Division

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Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? NOR submitted 4/22/2023	

Initial Response

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

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

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

Printed Name: Melodie Sanjari Title: Environmental Professional

Signature: Melodie Sanjari Date: 4/26/2023

email: msanjari@marathonoil.com Telephone: 575-988-8753

OCD Only

Received by: _____ Date: _____

MRO Spill Calculation Tool

Standing Liquid Inputs:

	Length (ft.)	Width (ft.) (Tank Displacement)	Avg. Liquid Depth (in.)	% Oil	Total Volume (bbls)	Water Volume (bbls)	Oil Volume (bbls)
Rectangle Area #1					0.00	0.00	0.00
Rectangle Area #2					0.00	0.00	0.00
Rectangle Area #3					0.00	0.00	0.00
Rectangle Area #4					0.00	0.00	0.00
Rectangle Area #5					0.00	0.00	0.00
Rectangle Area #6					0.00	0.00	0.00
Vessel Displacement					0.00	0.00	0.00
Vessel Displacement					0.00	0.00	0.00
				Liquid Volume:	**0.00**	**0.00**	**0.00**

Saturated Soil Inputs: Soil Type: Gravel or Sand

	Length (ft.)	Width (ft.)	Avg. Saturated Depth (in.)	% Oil	Total Volume (bbls)	Water Volume (bbls)	Oil Volume (bbls)
Rectangle Area #1		2200	0.0125		0.03	0.03	0.00
Rectangle Area #2					0.00	0.00	0.00
Rectangle Area #3					0.00	0.00	0.00
Rectangle Area #4					0.00	0.00	0.00
Rectangle Area #5					0.00	0.00	0.00
Rectangle Area #6					0.00	0.00	0.00
Rectangle Area #7					0.00	0.00	0.00
Rectangle Area #8					0.00	0.00	0.00
				Saturated Volume	**0.03**	**0.03**	**0.00**

	Total Volume (bbls)	Water Volume (bbls)	Oil Volume (bbls)
Total Spill Volume (bbls):	0.03	0.03	0.00
Total Spill Volume (gals):	1.37	1.37	0.00

Comments:

Color Key:	Required Input Cells	Supplemental Input Cells	No Input (Calculations)	No Input

Ground/Vegetation Overspray

Cover Type	Microns	Approximate Depth (in)
Ground		
Dull Color	10	0.00003281
Dark Color	50	0.00016404

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	>100 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

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

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

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

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State of New Mexico
Oil Conservation Division

Incident ID	nAPP2311239328
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Facility ID	fAPP2126331437
Application ID	

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

Printed Name: Melodie Sanjari Title: Environmental Professional

Signature: *Melodie Sanjari* Date: *6/5/2023*

email: msanjari@marathonoil.com Telephone: 575-988-8753

OCD Only

Received by: Jocelyn Harimon Date: 06/05/2023

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

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

☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Melodie Sanjari Title: Environmental Professional

Signature: *Melodie Sanjari* Date: 6/5/2023

email: msanjari@marathonoil.com Telephone: 575-988-8753

OCD Only

Received by: Jocelyn Harimon Date: 06/05/2023

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Incident Number: nAPP2311239328

Release Assessment and Closure

Chili Parlor 17 Fed TB

Unit P, Section 08, Township 22 South, Range 33 East

County: Lea

Vertex File Number: 23E-02431

Prepared for:
Marathon Oil Company

Prepared by:
Vertex Resource Services Inc.

Date:
May 2023

Received by OCD: 6/5/2023 9:51:36 AM

Release Assessment and Closure
Chili Parlor 17 Fed TB
Unit P, Section 08, Township 22 South, Range 33 East
County: Lea

Prepared for:
Marathon Oil Company
990 Town and Country BLVD
Houston, Texas, 77024

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

Prepared by:
Vertex Resource Services Inc.
3101 Boyd Drive
Carlsbad, New Mexico 88220

Chance Dixon

Chance Dixon B.Sc.
PROJECT MANAGER, REPORTING

6/5/2023
Date

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1.0 Introduction

Marathon Oil Company (Marathon) retained Vertex Resource Services Inc. (Vertex) to conduct a Release Assessment and Closure for a crude oil release that occurred on April 22, 2023, at Chili Parlor 17 Fed TB (hereafter referred to as "Chili Parlor"). Marathon submitted an initial C-141 Release Notification (Appendix A) to New Mexico Oil Conservation Division (NMOCD) District 1 on April 26, 2023. Incident ID number nAPP2311239328 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 the closure of this release, with the understanding that restoration of the release site will be deferred until such time as all oil and gas activities are terminated and the site is reclaimed as per NMAC 19.15.29.13.

2.0 Incident Description

The release occurred on April 22, 2023, with fluid in the flare line not reaching the tuning fork, which then sent it to the flare. The ground area around the flare was scorched. The incident was reported on April 26, 2023. The volume of the release is approximately 0.03 bbl, or just over 1 gallon. None of the fluids were recovered after the release. The impact remained inside of the site boundary. Additional details relevant to the release are presented in the C-141 Report. Daily Field Reports (DFRs) and site photographs are included in Appendix C.

3.0 Site Characteristics

The site is located approximately 25.1 miles west of Eunice, New Mexico. The legal location for the site is Unit P, Section 8, Township 22 South, Range 33 East in Lea County, New Mexico. The release area is located on state property. An aerial photograph and site schematic are presented in Figure 1.

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2023) indicates the site's surface geology primarily comprises Qep – Eolian and Piedmont deposits from the Holocene to middle Pleistocene interlayed with eolian sands and piedmont-slope deposits. The predominant soil texture on the site is loamy fine sand. The soil is excessively drained with a very high runoff. The karst geology potential for the site is low (United States Department of the Interior, Bureau of Land Management, 2018).

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 impact area on the southwest corner of the constructed well pad directly across from the north access road (Figure 1).

The surrounding landscape is associated with ridges and plains with elevations ranging between 3,280 and 4,460 feet. The climate is semiarid with average annual precipitation ranging between 10 and 16 inches. Using information from the United States Department of Agriculture, the dominant vegetation was determined to be black grama. Grasses with shrubs and half-shrubs dominate the historic plant community (United States Department of Agriculture, Natural

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Resources Conservation Service, 2023). Limited to no vegetation is allowed to grow on the compacted production pad, right-of-way, or access road.

4.0 Closure Criteria Determination

The nearest depth to groundwater (DTGW) reference to the site is a New Mexico Office of the State Engineer (NMOSE) borehole that was drilled on the western edge of the location (New Mexico Office of the State Engineer, 2023). Data from 2022 shows the NMOSE borehole was a dry hole 101 feet below ground surface (bgs). Information pertaining to the depth to groundwater determination is included in Appendix B.

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 1.2 miles southeast of the site (National Wetlands Inventory, 2023).

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.

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Closure Criteria Worksheet				
Site Name: Chili Parlor 17 Fed TB				
Spill Coordinates:		**32.3995934**	**Y: -103.5867087**	
Site Specific Conditions		**Value**	**Unit**	**Reference**
1	Depth to Groundwater	**>100**	feet	1
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	6,862	feet	2
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	8,905	feet	3
4	Within 300 feet from an occupied residence, school, hospital, institution or church	132,543	feet	4
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**	>500	feet	5
	ii) Within 1000 feet of any fresh water well or spring		feet	5
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)	6
7	Within 300 feet of a wetland	31,169	feet	7
8	Within the area overlying a subsurface mine	No	(Y/N)	8
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low	9
10	Within a 100-year Floodplain	>500	year	10
11	Soil Type	Loamy Fine Sand		11
12	Ecological Classification	Tonuco		12
13	Geology	Qep		13
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	>100'	<50' 51-100' >100'	

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

Table 2. Closure Criteria for Soils Impacted by a Release

Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	Constituent	Limit
> 100 feet	Chloride	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

TDS – total dissolved solides

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

Excavation of impacted soils was conducted on May 1, 2023, during initial response. Confirmation sampling was conducted on May 2, 2023. Field screening was completed on a total of 16 sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons), and Silver Nitrate (chlorides). Contaminated Soils were removed with a surface scrape across the release area. Impacted soil was transported by a licensed waste hauler and disposed of at an approved waste management facility. The Daily Field Report used to document the sampling event is included in Appendix C.

Notification that confirmatory samples were being collected was provided to the NMOCD on April 26, 2023 and is included in Appendix D. Confirmatory composite samples were collected from the base and walls of the excavation in 200-square-foot increments. A total of 16 samples were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to Hall Environmental 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). Laboratory results are presented in Table 3, and the laboratory data reports are included in Appendix E. All confirmatory samples collected and analyzed were below the applicable closure criteria for the site.

6.0 Closure Request

Vertex recommends no additional remediation action to address the release at the site. Laboratory analyses of confirmation samples collected at Chili Parlor show final confirmatory values below NMOCD closure criteria for areas where depth to groundwater is more than 100 feet bgs as presented in Table 1. There are no anticipated risks to human, ecological, or hydrological receptors at the release site.

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Vertex requests that this incident (nAPP2311239328) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Marathon certifies that all information in this report in the appendices is correct and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NMOCD requirements to obtain closure on the release at Chili Parlor.

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

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7.0 References

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8.0 Limitations

This report has been prepared for the sole benefit of Marathon Oil Company (Marathon). 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 Marathon. 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.

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FIGURES

Figure 1 - Lease Boundary

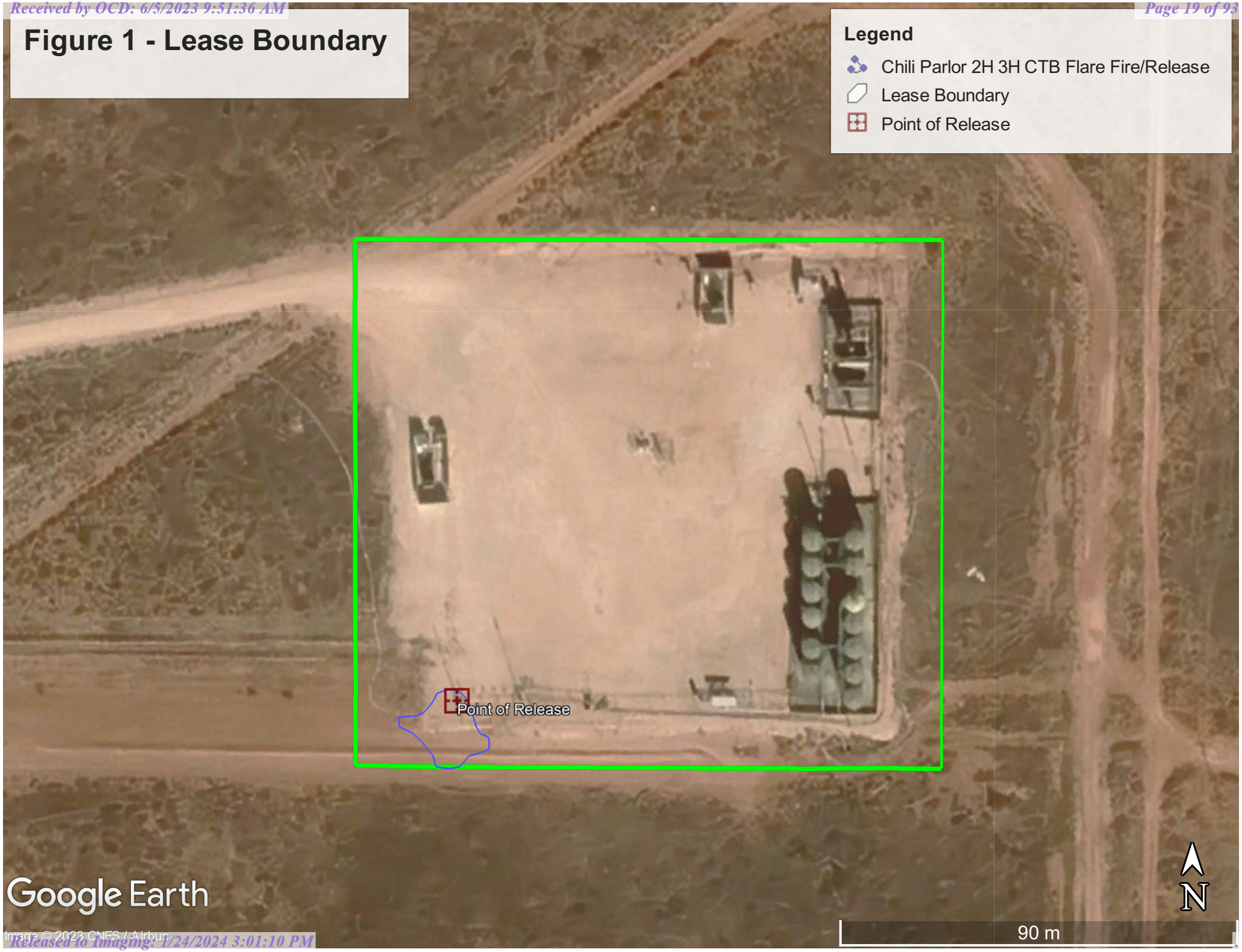
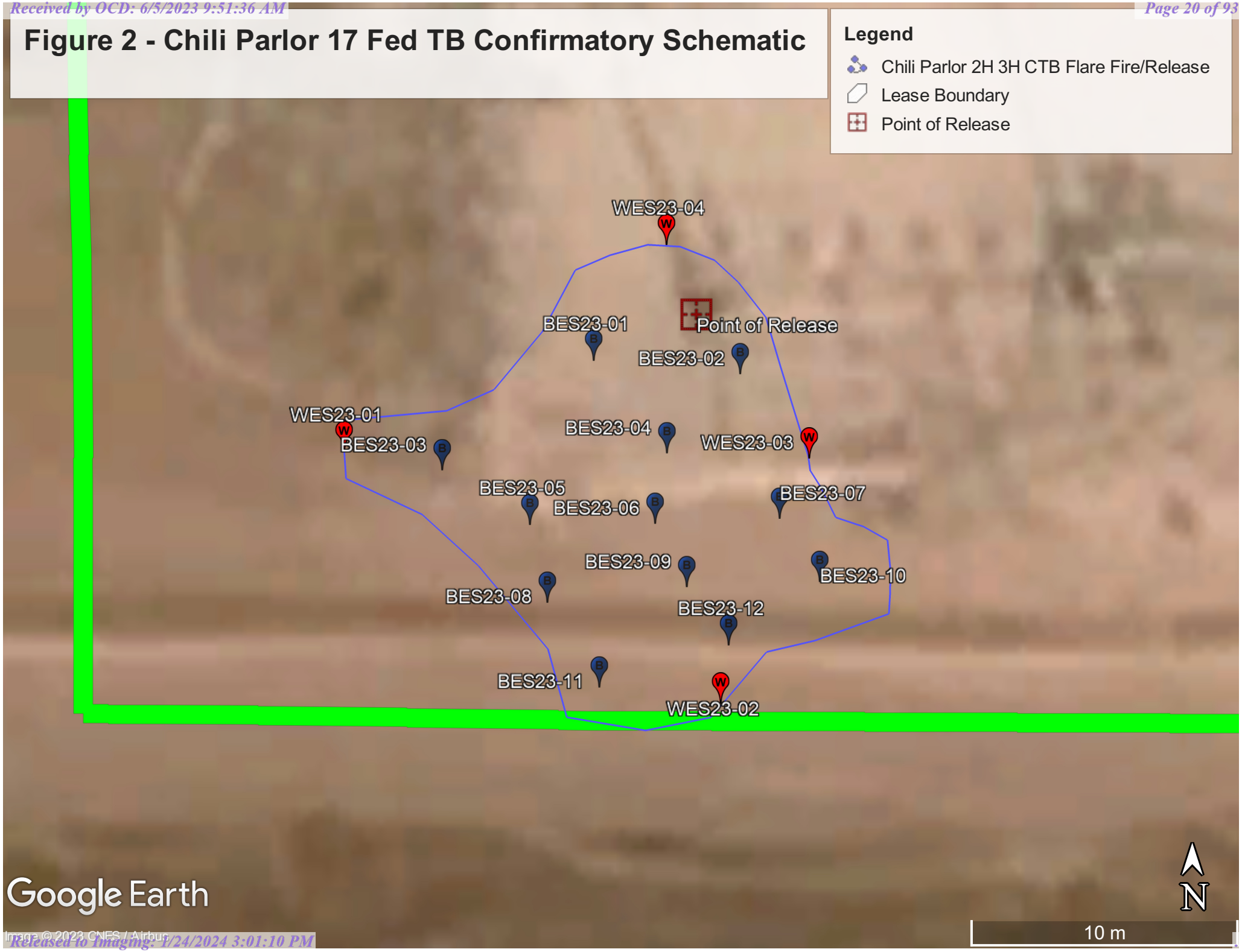


Figure 2 - Chili Parlor 17 Fed TB Confirmatory Schematic



TABLES

Table 3. Confirmatory Laboratory Results - Depth to Groundwater >100 feet bgs
Marathon Oil Corporation
Chili Parlor 2H #H CTB
NMOCD Tracking #: nAPP2311239328
Project #: 23E-02431
Lab Report: 2305201

Sample Description			Petroleum Hydrocarbons										Inorganic
Sample ID	Depth (ft)	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	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)	(mg/kg)	(mg/kg)	(mg/kg)
Criteria	NMOCD - NMAC <50 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	-	100	600
	NMOCD - NMAC 51-100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	10000
	NMOCD - NMAC >100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	20000
2023 Excavation													
WES23-01	0	May 2, 2023	ND	ND	ND	ND	ND	ND	36	ND	36	36	ND
WES23-02	0	May 2, 2023	ND	ND	ND	ND	ND	ND	38	ND	38	38	ND
WES23-03	0	May 2, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WES23-04	0	May 2, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BES23-01	0	May 2, 2023	ND	ND	ND	ND	ND	ND	24	ND	24	24	ND
BES23-02	0	May 2, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BES23-03	0	May 2, 2023	ND	ND	ND	ND	ND	ND	11	ND	11	11	ND
BES23-04	0	May 2, 2023	ND	ND	ND	ND	ND	ND	320	190	320	510	ND
BES23-05	0	May 2, 2023	ND	ND	ND	ND	ND	ND	16	ND	16	16	ND
BES23-06	0	May 2, 2023	ND	ND	ND	ND	ND	ND	20	ND	20	20	ND
BES23-07	0	May 2, 2023	ND	ND	ND	ND	ND	ND	27	ND	27	27	ND
BES23-08	0	May 2, 2023	ND	ND	ND	ND	ND	ND	21	ND	21	21	ND
BES23-09	0	May 2, 2023	ND	ND	ND	ND	ND	ND	25	ND	25	25	ND
BES23-10	0	May 2, 2023	ND	ND	ND	ND	ND	ND	36	ND	36	36	ND
BES23-11	0	May 2, 2023	ND	ND	ND	ND	ND	ND	29	ND	29	29	ND
BES23-12	0	May 2, 2023	ND	ND	ND	ND	ND	ND	36	52	36	88	ND

NMAC - New Mexico Administrative Code (Title 19, Chapter 15, Part 29; 2022)
ND - Not Detected at the Reporting Limit
- Denotes no standard/not analyzed
Bold and grey shaded indicates exceedance outside of NMOCD Closure Criteria (on-pad)

APPENDIX A - NMOCD C-141 Report

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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Release Notification

Responsible Party

Responsible Party Marathon Oil Permian LLC	OGRID 372098
Contact Name Melodie Sanjari	Contact Telephone 575-988-8753
Contact email msanjari@marathonoil.com	Incident # *(assigned by OCD)*
Contact mailing address 4111 S. Tidwell Rd., Carlsbad, NM 8220	

Location of Release Source

Latitude 32.3995934 Longitude -103.5867087
(NAD 83 in decimal degrees to 5 decimal places)

Site Name CHILI PARLOR 17 FED TB	Site Type Oil & Gas Facility
Date Release Discovered: 4/22/2023	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
P	08	22S	33E	Lea

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

Nature and Volume of Release

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

☒ Crude Oil	Volume Released (bbls) 0.03 bbls ignited	Volume Recovered (bbls) ignited
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release
The bridal to LSHH was plugged, causing fluid in the flare line to not reach the tuning fork, which then sent it to the flare. As a result, a ~3000 square foot area around the flare and edge of the location were scorched. Characterization of impact is ongoing.

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	>100 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

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

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

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

Printed Name: Melodie Sanjari Title: Environmental Professional

Signature: _____ Date: _____

email: msanjari@marathonoil.com Telephone: 575-988-8753

OCD Only

Received by: _____ Date: _____

Incident ID	nAPP2311239328
District RP	
Facility ID	fAPP2126331437
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

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

☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Melodie Sanjari Title: Environmental Professional

Signature: _____ Date: _____

email: msanjari@marathonoil.com Telephone: 575-988-8753

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

APPENDIX B – Closure Criteria Research Documentation

CP-1899 POD 1 0.5-Mile Radius

5/15/2023, 1:57:25 PM

Override 1

GIS WATERS PODs

Active

OSE District Boundary

Water Right Regulations

Closure Area

New Mexico State Trust Lands

Surface Estate

Both Estates

NHD Flowlines

Artificial Path

Stream River

SiteBoundaries

1:9,028

0 0.07 0.15 0.3 mi

0 0.15 0.3 0.6 km

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

Web Generated Map
Map is generated by web users.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
POD1 (TW-1)		CP-1899

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Marathon Oil	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
4111 S Tidwell Rd.	Carlsbad	NM	88220

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	23	59.07	N
	LONGITUDE	103	35	16.17	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

SE SE SE Sec. 09 T22S R33E, NMPM

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1249	Jackie D. Atkins	Atkins Engineering Associates, Inc.

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
2/9/2022	2/24/2022	temporary casing	±101	n/a

COMPLETED WELL IS: ☐ ARTESIAN ☑ DRY HOLE ☐ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): n/a

DATE STATIC MEASURED: 2/24/22, 3/8/2022

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow Stem Auger

CHECK HERE IF PITLESS ADAPTER IS INSTALLED ☐

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	101	±8.5	Boring	--	--	--	--

OSE DII MAR 11 2022 AM8:47

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 01/28/2022)

FILE NO.	CP-1899	POD NO.	POD1	TRN NO.	717713
LOCATION	SESESE 8 22S 33E			WELL TAG ID NO.	NA

PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	9	9	Sand, Fine-grained, poorly graded with caliche, Brown	Y ✓ N	
9	19	10	Sand, Fine-grained, poorly graded with caliche, Tan	Y ✓ N	
19	34	15	Sand, Fine-grained, poorly graded with sub-angular gravel, Tan	Y ✓ N	
34	44	10	Sand, Fine-grained, poorly graded, Tan	Y ✓ N	
44	49	5	Sand, Fine-grained, poorly graded with sub-angular gravel, Brown	Y ✓ N	
49	101	52	Clay, with sand ,Dry, Brown	Y ✓ N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0.00

5. TEST; RIG SUPERVISION

WELL TEST: TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION: Temporary well materials removed and he soil boring backfilled using drill cuttings from total depth to ten feet below ground surface, then hydrated bentonite chips ten feet below ground surface to surface.

OSE DII MAR 11 2022 AM8:51

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Shane Eldridge, Cameron Pruitt

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

Jack Atkins — Jackie D. Atkins — 3/10/2022

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 01/28/2022)

FILE NO. CP-1899	POD NO. POD1	TRN NO. 717713	
LOCATION SESESE 8 22S 33E		WELL TAG ID NO. NA	PAGE 2 OF 2

Mike A. Hamman, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 717713
File Nbr: CP 01899
Well File Nbr: CP 01899 POD1

Mar. 22, 2022

MELODIE SANJARI
MARATHON OIL
4111 S TIDWELL RD
CARLSBAD, NM 88220

Greetings:

The above numbered permit was issued in your name on 01/31/2022.

The Well Record was received in this office on 03/11/2022, stating that it had been completed on 02/24/2022, and was a dry well. The well is to be plugged according to 19.27.4.30 NMAC.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 01/31/2023.

If you have any questions, please feel free to contact us.

Sincerely,

Megen Telles
(575)622-6521

drywell

New Mexico Office of the State Engineer
Water Right Summary

get image list

WR File Number: CP 01899 **Subbasin:** CP **Cross Reference:** -

Primary Purpose: MON MONITORING WELL

Primary Status: PMT PERMIT

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

Total Diversion: 0 **Cause/Case:** -

Owner: MARATHON OIL

Contact: MELODIE SANJARI

Documents on File

Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
get images	EXPL	2022-01-31	PMT	APR	CP 01899 POD1	T	0	0	

Current Points of Diversion

(NAD83 UTM in meters)

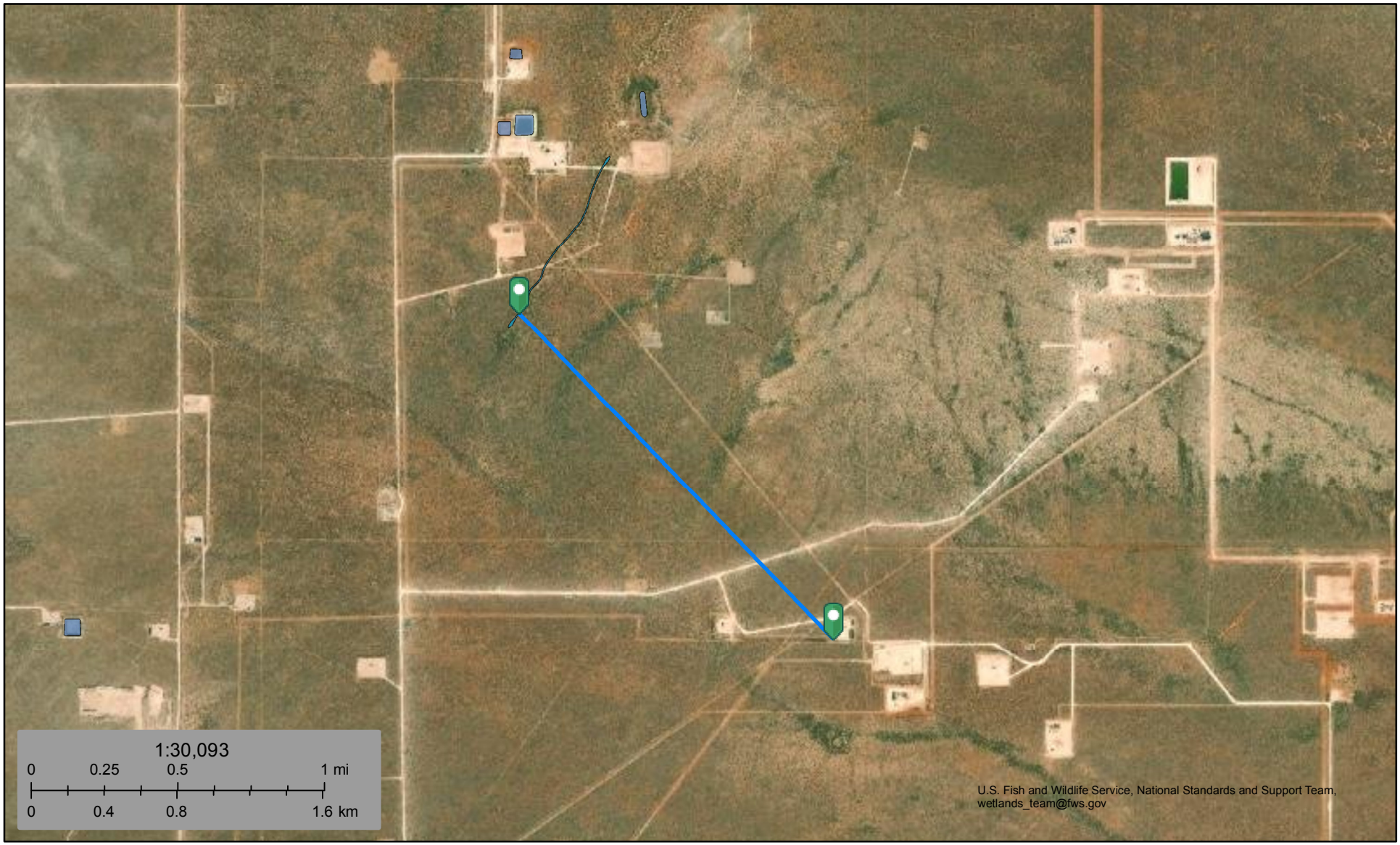
POD Number	Well Tag	Source	Q 64	Q16	Q4	Sec	Tws	Rng	X	Y	Other Location Desc
CP 01899 POD1	NA		4	4	4	08	22S	33E	632811	3585622	

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

Received by OCD: 6/5/2023 9:51:36 AM

U.S. Fish and Wildlife Service
National Wetlands Inventory

Intermittent Stream 6,862 Feet



May 15, 2023

Wetlands

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

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

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

Released to Imaging: 1/24/2024 3:01:10 PM

Received by OCD: 6/5/2023 9:51:36 AM

U.S. Fish and Wildlife Service
National Wetlands Inventory

Freshwater Pond 8,905 Feet

May 15, 2023

Wetlands

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

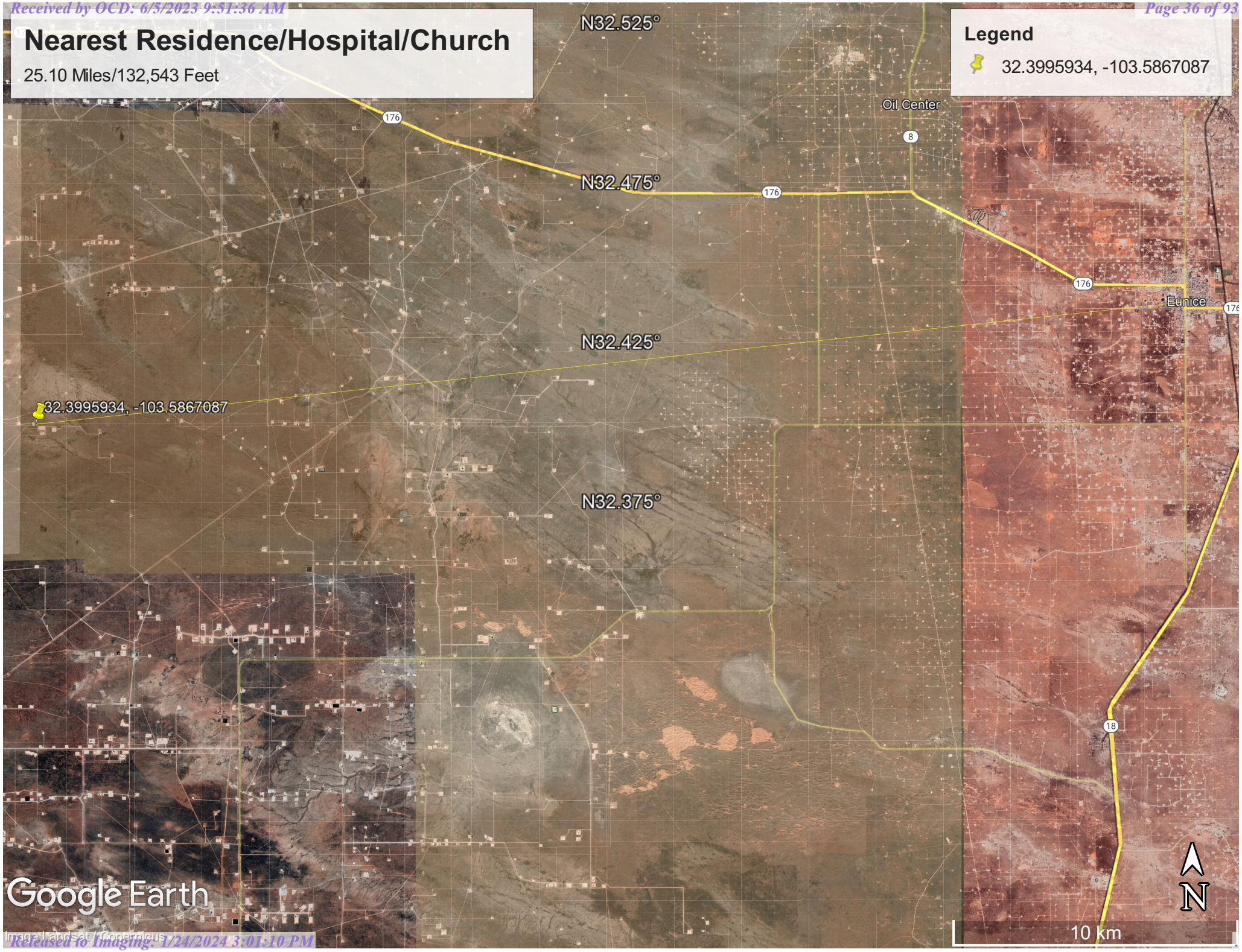
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

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

Released to Imaging: 1/24/2024 3:01:10 PM

Nearest Residence/Hospital/Church

25.10 Miles/132,543 Feet



Received by OCD: 6/5/2023 9:51:36 AM

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetland 31,169 Feet

May 15, 2023

Wetlands

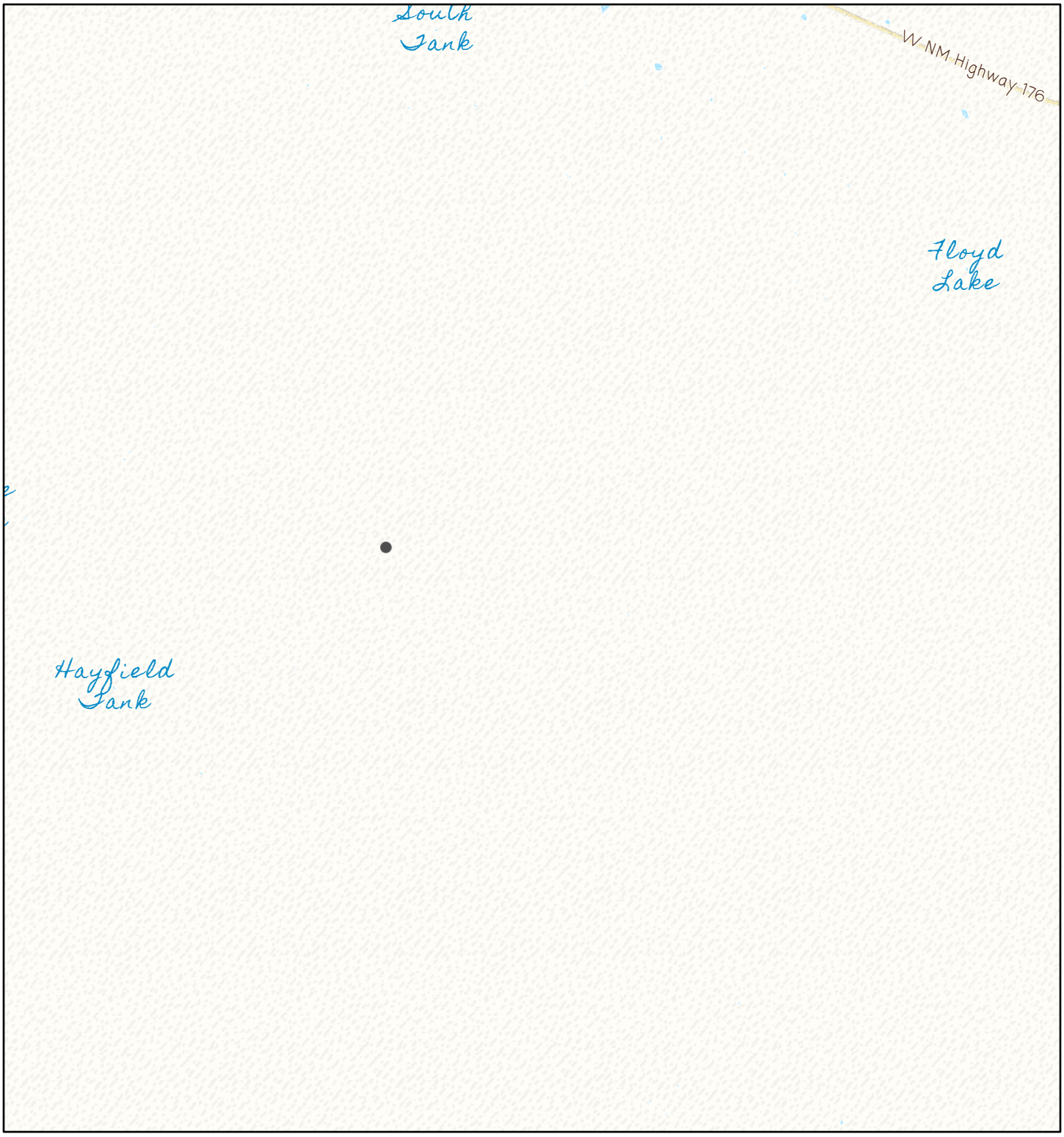
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

Released to Imaging: 1/24/2024 3:01:10 PM

Coal Mines in New Mexico



5/15/2023, 2:43:35 PM

1:144,448

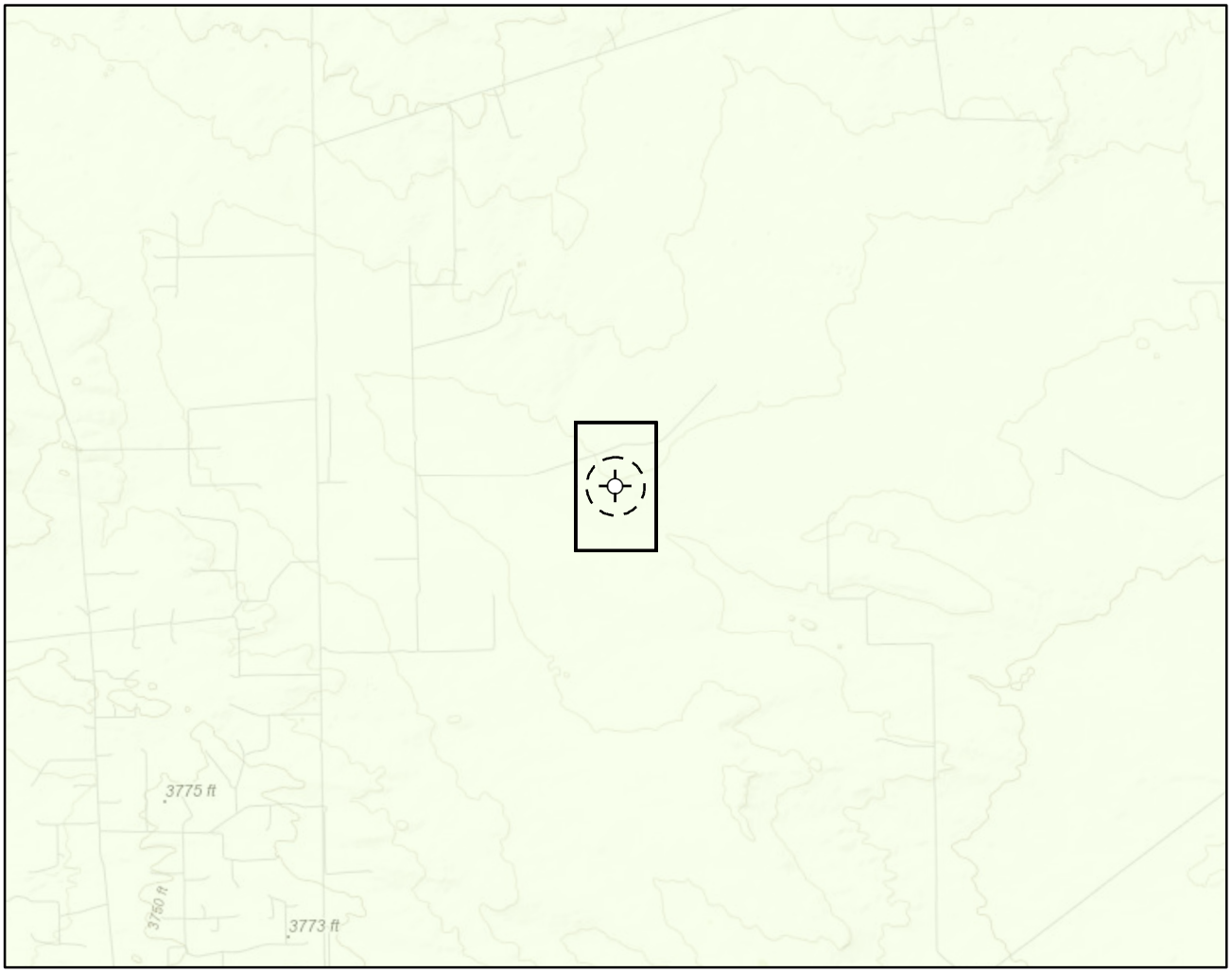
0 1 2 4 mi

0 1.5 3 6 km

NM Coal Mine Reclamation Program, NM EMNRD, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

EMNRD MMD GIS Coordinator

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



Overview Map

0 0.25 0.5 1 mi

Detail Map

0 150 300 600 ft.

Karst Potential

- Critical
- High
- Medium
- Low

- Site Location
- Site Buffer (1,000 sq.ft)

VERTEX

Map Center:
Lat/Long: 32.400000, -103.586709

NAD 1983 UTM Zone 13N
Date: May 15/23

N

Karst Potential Schematic
Chili Parlor 17 Fed TB

FIGURE:

X

Marathon Oil

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 2023; Overview Map: ESRI World Topographic. Karst potential data sourced from Rosswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management. (2018). Karst Potential.

VERSATILITY. EXPERTISE.

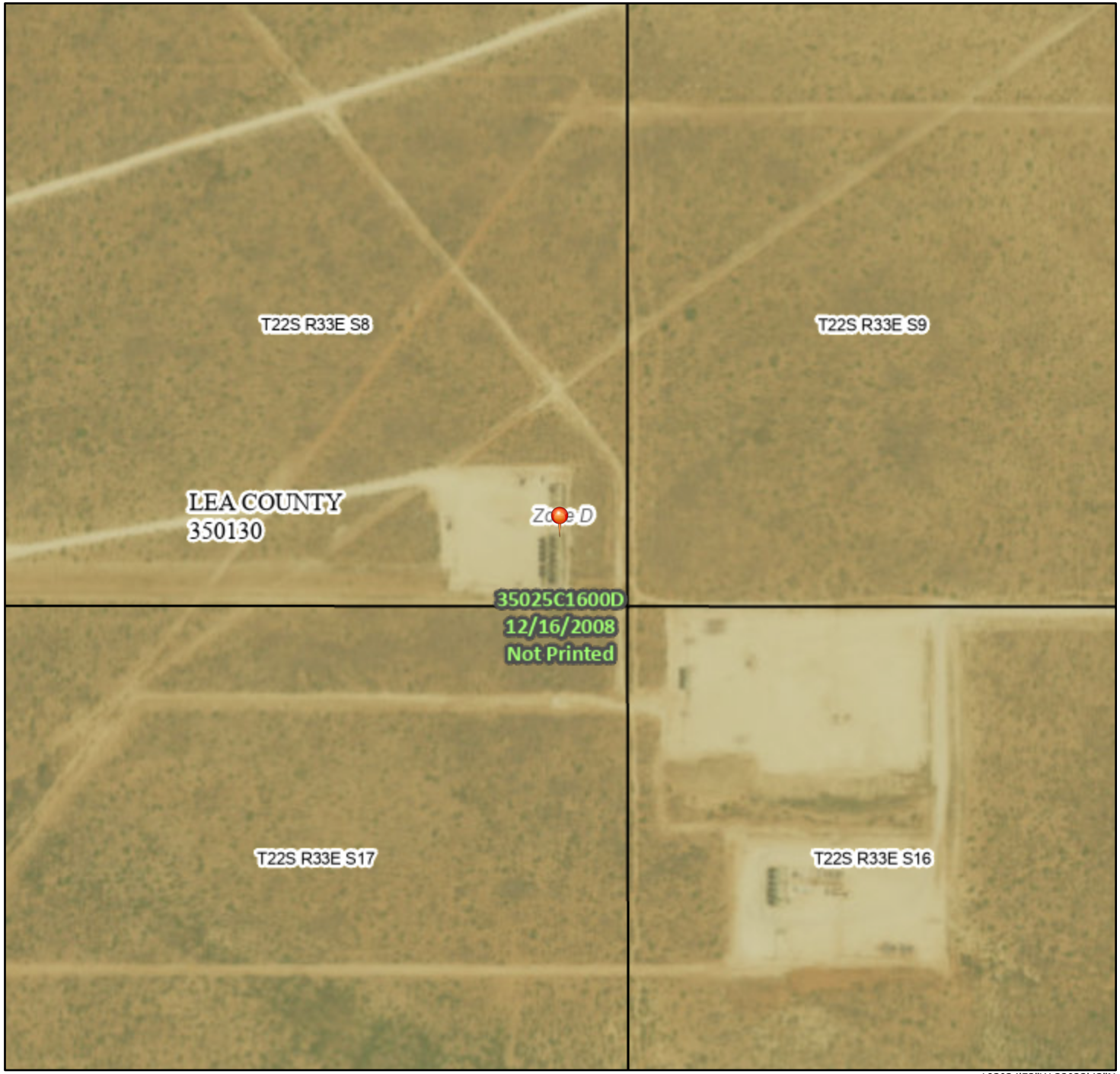
Document Path: G:\1-Projects_US PROJECTS\Marathon\23E-02431\Figure X Karst Potential Schematic Chili Parlor 17 Fed TB(23E-02431).mxd

Received by OCD: 6/5/2023 9:51:36 AM

National Flood Hazard Layer FIRMette

FEMA

103°35'31"W 32°24'14"N



103°34'53"W 32°23'43"N

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

1:6,000

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

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

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

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

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

N

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

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/15/2023 at 4:48 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Released to Imaging: 1/24/2024 3:01:10 PM

Lea County, New Mexico

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

Map Unit Setting

National map unit symbol: 2tw3c
Elevation: 3,280 to 4,460 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Tonuco and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tonuco

Setting

Landform: Ridges, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits

Typical profile

A - 0 to 12 inches: loamy fine sand
Bw - 12 to 17 inches: loamy sand
Bkkm - 17 to 39 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 12 to 20 inches to petrocalcic
Drainage class: Excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Gypsum, maximum content: 1 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 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R077DY048TX - Shallow 12-17" PZ
Hydric soil rating: No

Minor Components

Simona
Percent of map unit: 15 percent
Landform: Ridges, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Berino
Percent of map unit: 10 percent
Landform: Ridges, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Cacique
Percent of map unit: 5 percent
Landform: Ridges, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 19, Sep 8, 2022

USDA Natural Resources Conservation Service

Ecological site R077DY048TX
Shallow 12-17" PZ

Accessed: 05/15/2023

General information

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

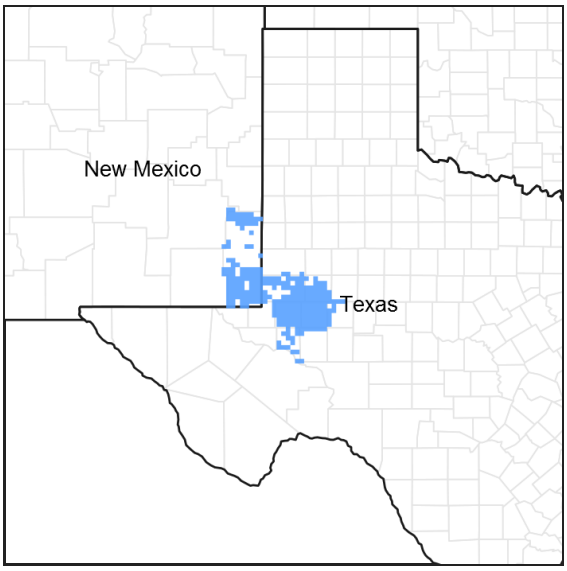


Figure 1. Mapped extent

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

MLRA notes

Major Land Resource Area (MLRA): 077D–Southern High Plains, Southwestern Part

This MLRA 77D is characterized by nearly level to gently undulating plains with scattered playa depressions. Soil temperature regime is thermic and soil moisture regime is aridic bordering on ustic. Sandy and loamy soils are generally well drained and range from shallow to deep and medium- to coarse-textured. Native vegetation is short- to midgrasses and sandy sites support tallgrasses with sand shin oak and mesquite. Current land use is mainly rangeland, although irrigated cropland is expanding.

Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296

Ecological site concept

This site occurs on shallow, calcareous soils on uplands. The reference vegetation consists of primarily shortgrasses with midgrasses, few forbs, and very few shrubs. Abusive grazing practices can lead to a shift in the plant community. Removal of fire from the ecosystem can lead to an increase in woody plant cover.

Associated sites

R077DY042TX	**Limy Upland 12-17" PZ** Shallow sites can be found adjacent to limy upland sites. The limy upland sites will occur as gently undulating soils that occur on broad upland plains.
R077DY047TX	**Sandy Loam 12-17" PZ** Sandy loam sites occur adjacent to shallow sites as deeper soils on nearly level plains.

Similar sites

R077DY047TX	**Sandy Loam 12-17" PZ** Sandy loam sites have similar forage plant communities with higher production potential.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Bouteloua eriopoda*

Physiographic features

Soils correlated in the MLRA 77D Shallow ecological site are shallow to a petrocalcic horizon. They were formed in moderately fine textured eolian sediments of the Blackwater Draw Formation of Pleistocene age. These soils are typically on gently sloping plains, narrow ridges, and side slopes along draws. Slope ranges from 0 to 15 percent.

The landforms for the Shallow site include Plain, Ridge, and Side slopes.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	2,000–5,000 ft
Slope	0–15%
Water table depth	72 in
Aspect	Aspect is not a significant factor

Climatic features

Continental Steppe climate is prevalent in MLRA 77D. This climate type is typical of interiors of continents and is characterized by large variations in the magnitude of ranges in daily temperature extremes, low relative humidity, and irregularly spaced rainfall of moderate amounts. This climate regime is also known for being semi-arid with mild winters.

Droughts occur with monotonous frequency although there will be years having excessive precipitation resulting in large accumulations of water that little benefit is obtained from the rainfall events. If good rains occur in the spring and summer months, annual production will be favorable even if the remainder of the year is not favorable. Most of the annual precipitation occurs as a result from spring and early summer thunderstorms. Due to the fact that the area is mainly flat, local flooding may occur but only of short duration. There is very little precipitation and infrequent snowfall amounts in the winter.

During the late winter and early spring months, dust storms occur very frequently. The flat plains of the area contribute very little resistance to the strong winds. Dust in many of these storms remains in the air for several days after the storms have passed.

Daytime temperatures are warm in the summer but there is a large diurnal range and most nights are comfortable. In summers, the normal daily maximum temperatures are in the low to mid 90s and the normal minimum temperatures are in the upper 60s and low 70s. Even though the temperatures may be high, the low humidity and high evaporation rates create a cooling effect during the nighttime hours. Fall months exhibit extremely variable weather. Winters are mild and are characterized by frequent cold fronts accompanied by strong, gusty, northerly winds. Most of the cold fronts are dry as they pass through the area.

Table 3. Representative climatic features

Frost-free period (average)	211 days
Freeze-free period (average)	233 days
Precipitation total (average)	20 in

Influencing water features

Soil features

The soils of this site are very shallow to shallow well drained, calcareous, gravelly soils. Permeability is moderate and runoff is low to medium. Parent material is a thin mantle of medium to moderately coarse textured eolian sediments over an indurated layer.

Major Soil Taxonomic Units correlated to this site include: Blakeney soils, Conger soils, Simona soils, and Slaughter soils.

Table 4. Representative soil features

Surface texture	(1) Gravelly clay loam (2) Loam (3) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	7–20 in
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	2–3 in
Calcium carbonate equivalent (0-40in)	10–60%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–4
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	5–65%
Subsurface fragment volume >3" (Depth not specified)	0–3%

Ecological dynamics

The Reference Plant Community of the Shallow Ecological Site was a Shortgrass/Midgrass Community (1.1). Few if any tallgrass species could be found. Grass species accounted for 90 percent of the total site production. A wide variety of forbs are produced on this site with scattered woody shrubs equally accounting for 10 percent of the total annual production. This site occurs on gently to moderately sloping upland areas. Slopes typically range from 1 to 5 percent. The soils of the site vary from shallow fine sandy loams to loams with a depth of 12 to 20 inches over indurated caliche. The soils have good plant-soil-moisture relationships, but moisture-holding capacity is moderate, often limiting productivity.

The dominant shortgrass species is black grama (*Bouteloua eriopoda*), with lesser amounts of buffalograss (*Bouteloua dactyloides*) and Wright threeawn (Aristida wrightii). Trace amounts of Hall's panicum (*Panicum hallii*), blue grama (*Bouteloua gracilis*) and hairy grama (*Bouteloua hirsuta*) can be found on the site. The dominant midgrass species is sideoats grama (*Bouteloua curtipendula*) and plains bristlegrass (*Setaria macrostachya*), with lesser amounts of cane bluestem (*Bothriochloa barbinodis*), Arizona cottontop (*Digitaria californica*), sand dropseed (*Sporobolus cryptandrus*), slim tridens (*Tridens muticus*), tobosagrass (*Pleuraphis mutica*), vine mesquite (*Panicum obtusum*), and Reverchon bristlegrass (*Setaria reverchonii*). A good variety of forbs exist but the amount varies greatly from year to year depending on moisture. The more commonly found forbs are trailing ratany (*Krameria lanceolata*), orange zexmania (Zexmania hispida), bush sunflower (*Simsia calva*), dotted gayfeather (*Liatris punctata*), white prairie clover (*Dalea albiflora*), gaura spp. (Gaura spp.), plains blackfoot (Melampodium leucanthus), tansy aster (*Machaeranthera tanacetifolia*), Texas croton (*Croton texensis*), Texas sleepy daisy (*Xanthisma texanum*), western ragweed (Ambrosia psilstachya), Oenothera spp. (Oenothera spp.), yellow spiny daisy (Haplpappus spinulosus), and desert holly (*Atriplex hymenelytra*). The major shrubs are catclaw acacia (*Acacia greggii*), vine ephedra (*Ephedra antisyphilitica*), lotebush (*Ziziphus obtusifolia*), pricklypear spp. (Opuntia spp.), javalina bush (*Condalia ericoides*), and winterfat (*Krascheninnikovia lanata*).

Fire plays a role in the ecology of this site as well as most other high plains sites. The general role of fire was to sustain the natural grassland and suppress shrubby species. Fire helps to keep a balance between the grasses, forbs and shrubs. However, in the shortgrass region, fire was probably secondary to climate in shaping the reference vegetative state. A drier climate (<20 inches annual precipitation) creates a situation where the subsoil is dry more often than it is wet. Plant roots grow in response to moisture and this dryer climate favors short grasses with fibrous root systems or short rhizomatous grasses. Annual forbs are stimulated by fire and diversity is generally increased. Heavy grazing after a fire can have a negative effect if conditions are dry and remain so for an extended period.

Periodic overgrazing and trampling by migrating herds of bison and elk as well as resident herds of pronghorn antelope occurred during drought periods. Bison moved about in large herds over the region somewhat regulated by water sources and fire frequency.

However, long rest periods followed once the large herds of bison moved out of the area, allowing the resilient grassland to re-establish and maintain its structure.

Variations in climatic factors, especially the amount and timing of precipitation, greatly influence the productivity of ecological sites and are largely responsible for the fluctuations in the amount of vegetative growth from one season to the next. It is not unusual for fluctuations of greater than 50% to occur from one year to another. These types of climatic variation are part of the overall environment in which the reference state developed. However, it needs to be pointed out that long-term drought (4 to 6 years of rainfall 50 percent below the mean) can act in concert with other forces to affect changes in plant communities. For instance, extended drought weakens plants and makes them more susceptible to the effects of overgrazing. Drought conditions coupled with fire can be damaging and need long periods of time to fully recover. Extremely dry summers followed by wet winters can favor cool-season annual grasses at the expense of perennial warm-season species. A well-adapted, healthy community could better withstand such rigors of drought. However, even they experience damage that would result in some departure from the former stable state. Usually, the departure would be temporary.

When domestic livestock were brought to the plains in the 1870's, it was largely an open range situation. By 1890, however, most of the area had been fenced and livestock were confined to these areas continually. Not understanding the limits of rangeland productivity, European settlers overstocked the area with domesticated livestock almost universally. As overgrazing occurred on this site, there was a reduction of the less grazing resistant

midgrass species, a decline in mulch and organic matter, and consequently a reduction in intensity and frequency of fires. The shift in plant cover to less palatable shortgrass species and the decline in soil cover, favors woody plant encroachment.

With continuous heavy grazing, no fire, no brush management and/or pest management this site will transition to the Shortgrass/Shrub/Annuals Community (1.2). As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species decline in stature, productivity and density. The tendency of this site is to become a shortgrass dominant site if long term grazing abuse occurs. This will lead to a decline in the vigor of sideoats grama and other palatable midgrass species. Croton species and western ragweed will increase and hairy tridens (*Erioneuron pilosum*), annual broomweed (Guitierrezia dracunculoides), broom snakeweed (*Gutierrezia sarothrae*), mesquite (*Prosopis glandulosa*) and numerous annuals will invade the site. The production of vegetation has shifted from mostly herbaceous vegetation to increasing amounts of woody shrubs. Herbaceous vegetation is still the largest production in this state. Nutrient cycling, the water cycle, watershed protection and biological functions have changed somewhat. This state can transition back to reference with good management practices such as prescribed grazing, brush management and pest management. Prescribed burning could be used if the fuel load and conditions allow.

If long-term, heavy grazing continues with no fire or any form of brush and pest management, a major threshold will be crossed to the Shrub/Shortgrass Community (2.1). In this state, mesquite, broom snakeweed and pricklypear will dominate the site. The typical shortgrass species will be perennial three-awns, hairy tridens and other invading low quality short grasses. Bare areas will increase with annuals filling the voids.

The loss of herbaceous cover and increased bare soil encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and biological functions have been severely reduced.

The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Prescribed grazing with rest periods during the growing season, re-seeding with adapted native grass species, chemical and/or mechanical brush management, and some form of pest management will be required to return this state back to the reference state. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this state.

In the early 1930's Lehman lovegrass (*Eragrostis lehmanniana*), a grass of African origin, was introduced in the southern high plains as a drought tolerant, easy to establish introduced grass species. This grass species was used in many grass mixtures and pasture plantings in an attempt to re-seed poor condition rangeland following mechanical brush management and to return old cropland fields to a perennial vegetative state for livestock grazing purposes. This grass is both invasive and persistent; published evidence indicates that variables such as elevation, summer precipitation, winter temperatures, and soils impact its abundance and distribution. Shallow upland sites in a weakened state near established areas of Lehman lovegrass may become invaded by this grass. Presently, several thousand acres of loam, clay loam and sandy loam sites have been invaded to the point that Lehman lovegrass is the dominant grass species with few if any native species remaining. The resulting plant community is a Lehman Lovegrass/Shrub Dominant Community (3.1). Once this lovegrass has become well established, returning the site to reference would be expensive and generally not very successful or practical. Prescribed burning for seedbed preparation purposes may be necessary to remove excessive amounts of plant biomass. Moderate to heavy mechanical brush management, heavy seedbed preparation and re-seeding to a native grass mixture would be required. The application of herbicides can be effective to reduce competition from this lovegrass species, but there is only a narrow time of treatment opportunity. Since this grass species has become naturalized much like K.R. bluestem has in Central Texas, it is unlikely that it will disappear through any natural processes such as competition from native species.

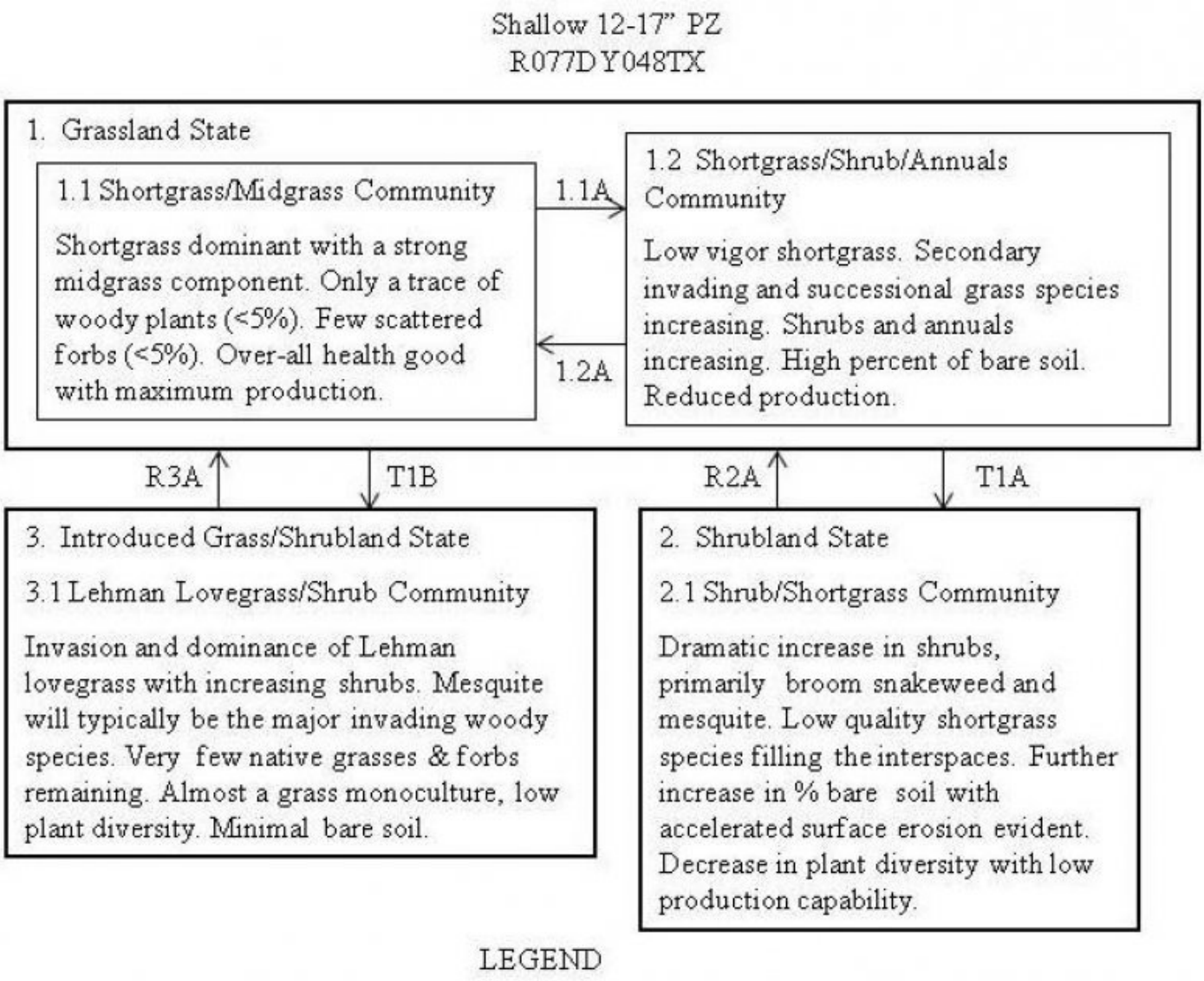
NOTE: Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

STATE AND TRANSITIONAL PATHWAYS: (DIAGRAM)

Narrative:
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional

guidance should always be sought before pursuing a treatment scenario.

State and transition model



LEGEND

1.1A - Heavy Continuous Grazing, No Fire, No Brush Management, No Pest Management
1.2A - Prescribed Grazing, Prescribed Fire, Brush Management, Pest Management
T1A - Heavy Continuous Grazing, No Fire, Long-term Drought, No Brush Management, No Pest Management
R2A - Prescribed Grazing, Growing Season Rests, Brush Management, Range Planting, Pest Management
T1B - Heavy Continuous Grazing, Invasion Introduced Grass, No Fire, No Brush Management, No Pest Management
R3A - Prescribed Fire, Prescribed Grazing, Growing Season Rests, Brush Management, Range Planting, Pest Management

State 1
Grassland State

The Reference Plant Community of the Shallow Ecological Site is a Shortgrass/Midgrass Community (1.1). Few if any tallgrass species can be found. Grass species account for 90 percent of the total site production. A wide variety of forbs are produced on this site with scattered woody shrubs equally accounting for 10 percent of the total annual production. The dominant shortgrass species was black grama, with lesser amounts of buffalograss and Wright threeawn. With continuous heavy grazing, no fire, no brush management and/or pest management this site will

transition to the Shortgrass/Shrub/Annuals Community (1.2). As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species decline in stature, productivity and density. The tendency of this site is to become a shortgrass dominant site if long-term grazing abuse occurs. This will lead to a decline in the vigor of sideoats grama and other palatable midgrass species.

Community 1.1
Shortgrass/Midgrass Community

Figure 4. 1.1 Shortgrass/Midgrass Community

The Reference Plant Community of the Shallow Ecological Site is a Shortgrass/Midgrass Community (1.1). Grass species account for 90 percent of the total site production with black grama dominating and a strong midgrass component. A wide variety of forbs are produced on this site with scattered woody shrubs equally accounting for 10 percent of the total annual production. This site occurs on gently to moderately sloping upland areas. Slopes typically range from 1 to 5 percent. The shallow soils of the site vary from fine sandy loams to loams. The soils have good plant-soil-moisture relationships, but moisture-holding capacity is moderate, often limiting productivity. Most energy and nutrient cycling was contained in the narrow grass/soil interface and evapo-transpiration was minimal. Maintenance of this plant community requires continued proper grazing management as well as occasional brush and pest management.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	450	900	1350
Shrub/Vine	25	50	75
Forb	25	50	75
Tree	0	0	0
Microbiotic Crusts	0	0	0
Total	**500**	**1000**	**1500**

Figure 6. Plant community growth curve (percent production by month). TX1251, Warm-season bunchgrasses w/ forbs & shrubs. Warm-season bunchgrasses with forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	12	16	15	20	18	9	1	0

Community 1.2
Shortgrass/Shrub/Annuals Community

Figure 7. 1.2 Shortgrass/Shrub/Annuals Community

With continuous heavy grazing, no fire, no brush management and/or pest management this site will transition to the Shortgrass/Shrub/Annuals Community (1.2). As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species decline in stature, productivity and density. The tendency of this site is to become a shortgrass dominant site if long term grazing abuse occurs. This will lead to a decline in the vigor of sideoats grama and other palatable midgrass species. Croton species and western ragweed will increase and hairy tridens, annual broomweed, broom snakeweed, mesquite and numerous annuals will invade/increase on the site. The production of vegetation has shifted from mostly herbaceous vegetation to increasing amounts of woody shrubs. Herbaceous vegetation is still the largest production in this state. Nutrient cycling, the water cycle, watershed protection and biological functions have changed somewhat. This state can transition back to the reference community with good management practices such as prescribed grazing, brush management and pest management. Prescribed burning could be used if the fuel load and conditions allow.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	300	600	900
Shrub/Vine	200	300	400
Forb	60	80	100
Tree	0	0	0
Microbiotic Crusts	0	0	0
Total	**560**	**980**	**1400**

Figure 9. Plant community growth curve (percent production by month). TX1252, Shortgrass Dominant/Invading Shrub Community. Warm-season shortgrasses with increasing shrubs and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	12	16	15	20	18	9	1	0

Pathway 1.1A
Community 1.1 to 1.2

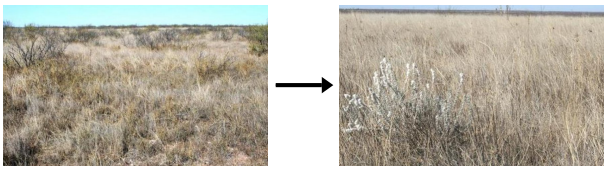
Shortgrass/Midgrass Community

Shortgrass/Shrub/Annuals Community

With continuous heavy grazing, no fire, no brush management and/or pest management this site will shift to the

Shortgrass/Shrub/Annuals Community (1.2). As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species decline in stature, productivity and density.

Pathway 1.2A
Community 1.2 to 1.1



Shortgrass/Shrub/Annuals Community **Shortgrass/Midgrass Community**

This state can transition back to near reference conditions with good management practices such as prescribed grazing, brush management and pest management. Prescribed burning could be used if the fuel load and conditions allow.

Conservation practices

Brush Management
Prescribed Burning
Integrated Pest Management (IPM)
Prescribed Grazing

State 2
Shrubland State

If long-term, heavy grazing continues with no fire or any form of brush and pest management, a major threshold will be crossed from the Grassland State (1.0) to the Shrubland State (2.0). In this state, mesquite, broom snakeweed and pricklypear will dominate the site. The typical shortgrass species will be perennial three-awns, hairy tridens and other invading low quality short grasses. Bare areas will increase with annuals filling the voids.

Community 2.1
Shrub/Shortgrass Community

Figure 10. 2.1 Shrub/Shortgrass Community

If long-term, heavy grazing continues with no fire or any form of brush and pest management, a major threshold will be crossed to the Shrub/Shortgrass Community (2.1). In this state, mesquite, broom snakeweed and pricklypear will dominate the site. The typical shortgrass species will be perennial threeawns, hairy tridens and other invading low quality short grasses. Bare areas will increase with annuals filling the voids. The loss of herbaceous cover and increased bare soil encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and

biological functions have been severely reduced. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Prescribed grazing with rest periods during the growing season, re-seeding with adapted native grass species, chemical and/or mechanical brush management, and some form of pest management will be required to return this state back to the reference state. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this state.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	400	500	600
Grass/Grasslike	150	300	450
Forb	60	80	100
Microbiotic Crusts	0	0	0
Tree	0	0	0
Total	**610**	**880**	**1150**

Figure 12. Plant community growth curve (percent production by month). TX1254, Shrub/Shortgrass/Annuals Community. Spring and fall growth of shortgrasses, annuals, and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	4	6	10	16	15	20	15	12	1	0

State 3
Introduced Grass/Shrubland State

Lehman lovegrass is the dominant grass species with few if any native species remaining. The resulting plant community is a Lehman Lovegrass/Shrub Dominant Community (3.1). Once this lovegrass has become well established, returning the site to the reference state(1)would be expensive and generally not very successful or practical.

Community 3.1
Lehman Lovegrass/Shrub Community

Figure 13. 3.1 Lehman Lovegrass/Shrub Community

Several thousand acres of loam, clay loam and sandy loam sites in the southern high plains that are in a degraded state have been invaded by Lehman lovegrass to the point that it is the dominant grass species with few if any native species remaining. The resulting plant community is a Lehman Lovegrass/Shrub Dominant Community (3.1). Once this lovegrass has become well established, returning the site to the reference state(1) would be expensive and generally not very successful or practical. Prescribed burning for seedbed preparation purposes may be necessary to remove excessive amounts of plant biomass. Moderate to heavy mechanical brush management,

heavy seedbed preparation and re-seeding to a native grass mixture would be required. The application of herbicides can be effective to reduce competition from this lovegrass species, but there is only a narrow time of treatment opportunity. It is unlikely that Lehman loverass will disappear through any natural processes such as competition from native species.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1200	2100	3000
Shrub/Vine	300	550	800
Forb	5	10	15
Tree	0	0	0
Microbiotic Crusts	0	0	0
Total	**1505**	**2660**	**3815**

Figure 15. Plant community growth curve (percent production by month). TX1255, Lehman Lovegrass/Shrub Dominant Community. Lehman lovegrass with shrub dominance..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	8	16	18	12	15	18	6	1	0

Transition T1A
State 1 to 2

If long-term, heavy grazing continues with no fire or any form of brush and pest management, a major threshold will be crossed from the Shortgrass/Shrubs/Annuals Community (1.2) to the Shrub/Shortgrass Community (2.1). In this state, mesquite, broom snakeweed and pricklypear will dominate the site.

Transition T1B
State 1 to 3

If long-term, heavy grazing continues with no fire or any form of brush and pest management, along with encroachment of introduced grasses such as Lehman lovegrass, a major threshold will be crossed from the Shortgrass/Shrubs/Annuals Community (1.2) to the Lehman lovegrass/ Shrubs Community. Dominant species include Lehman lovegrass and mesquite.

Restoration pathway R2A
State 2 to 1

The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Prescribed grazing with rest periods during the growing season, re-seeding with adapted native grass species, chemical and/or mechanical brush management, and some form of pest management will be required to return this state back to the reference state(1). With the reduced amounts of grass fuel, prescribed burning is usually not an option in this state.

Conservation practices

Brush Management
Range Planting
Integrated Pest Management (IPM)
Prescribed Grazing

Restoration pathway R3A

State 3 to 1

Returning the site to the reference state would be expensive and generally not very successful or practical. Prescribed burning for seedbed preparation purposes may be necessary to remove excessive amounts of plant biomass. Moderate to heavy mechanical brush management, heavy seedbed preparation and re-seeding to a native grass mixture would be required.

Conservation practices

Brush Management
Prescribed Burning
Range Planting
Prescribed Grazing

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Shortgrass**			125–375	
	black grama	BOER4	*Bouteloua eriopoda*	125–375	–
2	**Midgrass**			100–300	
	sideoats grama	BOCU	*Bouteloua curtipendula*	100–300	–
3	**Midgrasses**			175–525	
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	50–150	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	25–75	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	25–75	–
	Arizona cottontop	DICA8	*Digitaria californica*	25–75	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	25–75	–
	vine mesquite	PAOB	*Panicum obtusum*	0–1	–
	slim tridens	TRMUE	*Tridens muticus var. elongatus*	0–1	–
4	**Shortgrasses**			50–150	
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	25–75	–
	buffalograss	BODA2	*Bouteloua dactyloides*	25–75	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–5	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–5	–
	Hall's panicgrass	PAHA	*Panicum hallii*	0–5	–
Forb					
5	**Forbs**			25–75	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	2–5	–
	desertholly	ATHY	*Atriplex hymenelytra*	2–5	–
	Texas croton	CRTE4	*Croton texensis*	2–5	–
	whiteflower prairie clover	DAAL	*Dalea albiflora*	2–5	–
	beeblossom	GAURA	*Gaura*	2–5	–
	trailing krameria	KRLA	*Krameria lanceolata*	2–5	–
	dotted blazing star	LIPU	*Liatris punctata*	2–5	–

	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	2–5	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	2–5	–
	plains blackfoot	MELE2	*Melampodium leucanthum*	2–5	–
	evening primrose	OENOT	*Oenothera*	2–5	–
	awnless bushsunflower	SICA7	*Simsia calva*	2–5	–
	Texas sleepydaisy	XATE	*Xanthisma texanum*	2–5	–
Shrub/Vine					
6	**Shrubs**			25–75	
	bigtooth maple	ACGRG	*Acer grandidentatum var. grandidentatum*	4–12	–
	catclaw acacia	ACGRG3	*Acacia greggii var. greggii*	4–12	–
	javelina bush	COER5	*Condalia ericoides*	4–12	–
	clapweed	EPAN	*Ephedra antisyphilitica*	4–12	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	4–12	–
	pricklypear	OPUNT	*Opuntia*	4–12	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	4–12	–

Animal community

This site is inhabited by dove, quail, deer and pronghorn. Limited populations of pronghorn antelope frequent the site. The limited amount of woody plants does not provide good cover and food sources for deer.

This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preferences for food and plant suitability for cover are rated.

Preferred (P) – Percentage of plant in animal diet is greater than it occurs on the land
Desirable (D) – Percentage of plant in animal diet is similar to the percentage composition on the land
Undesirable (U) – Percentage of plant in animal diet is less than it occurs on the land
Not Consumed (N) – Plant would not be eaten under normal conditions; only consumed when other forages not available.
Used, but degree of utilization unknown (X) – Percentage of plant in animal diet is unknown
Toxic (T) – Rare occurrence in diet and, if consumed in any tangible amounts results in death or severe illness in animal

Hydrological functions

These shallow soils have moderate to moderately low runoff potential due to slopes which range from 1 to 5 percent. These soils are fertile and absorb water at a moderate rate. Moisture storage is limited by the 12 to 20 inch depth to indurated caliche.

Recreational uses

This site has very little value from an aesthetic standpoint. The site is occupied almost exclusively by native short and midgrass species with few woody shrubs. Recreational activities could include bird hunting, camping, hiking, bird watching, photography, and horseback riding.

Wood products

None.

Other products

None.

Other information

None.

Inventory data references

NRCS FOTG – Section II of the FOTG Range Site Descriptions and numerous historical accounts of vegetative conditions at the time of early settlement in the area were used in the development of this site description. Vegetative inventories were made at several site locations for support documentation.

Inventory Data References (documents):
NRCS FOTG – Section II - Range Site Descriptions
NRCS Clipping Data summaries over a 20 year period

Other references

Reviewers and Technical Contributors:
Mark Moseley, RMS, NRCS, Boerne, Texas
Justin Clary, RMS, NRCS, Temple, Texas
Kelly Attebury, RSS, NRCS, Lubbock, Texas

Other references: (List other references used in the description or correlation of this site.)
J.R. Bell, USDA-NRCS Rangeland Management Specialist (retired)
Natural Resources Conservation Service - Range Site Descriptions
USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database
Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press
Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)
Texas A&M Exp. Station, College Station, Texas
Texas Tech University – Department of Natural Resources Management
Kingsbury, John M. (1964) Poisonous Plants of the United States and Canada.
Soil Science: November 1964 - Volume 98 - Issue 5 - ppg 349.
Sosebee, Ronald E. Timing – The Key to Herbicidal Control of Broom Snakeweed. Department of Natural Resources Management, Texas Tech University, Lubbock, Texas.

Contributors

Clint Rollins, RMS, NRCS, Amarillo, Texas

Acknowledgments

Site Development and Testing Plan

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document.

Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

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)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
Contact for lead author	806-791-0581
Date	09/04/2007
Approved by	Mark Moseley, RMS, NRCS, Boerne, Texas
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Slight to moderate.

2. **Presence of water flow patterns:** Slight to moderate.

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20-25% bare ground.

5. **Number of gullies and erosion associated with gullies:** Slight to moderate.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None to slight.

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

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Shallow clays and clay loam surfaces; weak fine granular surface; hard; friable; few fine roots; calcareous; moderately alkaline; moderate permeability; well drained; good plant-soil moisture; moderate SOM.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low vegetative cover and percent slopes makes this site susceptible to erosion.

This site is a very slowly permeable soil, runoff is medium to high depending on slopes and available water holding capacity is moderate to high.

---

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

---

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: Warm-season midgrasses > Warm-season shortgrasses>>

    Sub-dominant:

    Other: Forbs = Shrubs/Vines

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses due to their growth habit will exhibit some mortality and decadence though minimal.

---

14. **Average percent litter cover (%) and depth (in):** Litter is dominantly herbaceous.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500 to 1500 pounds per acre.

---

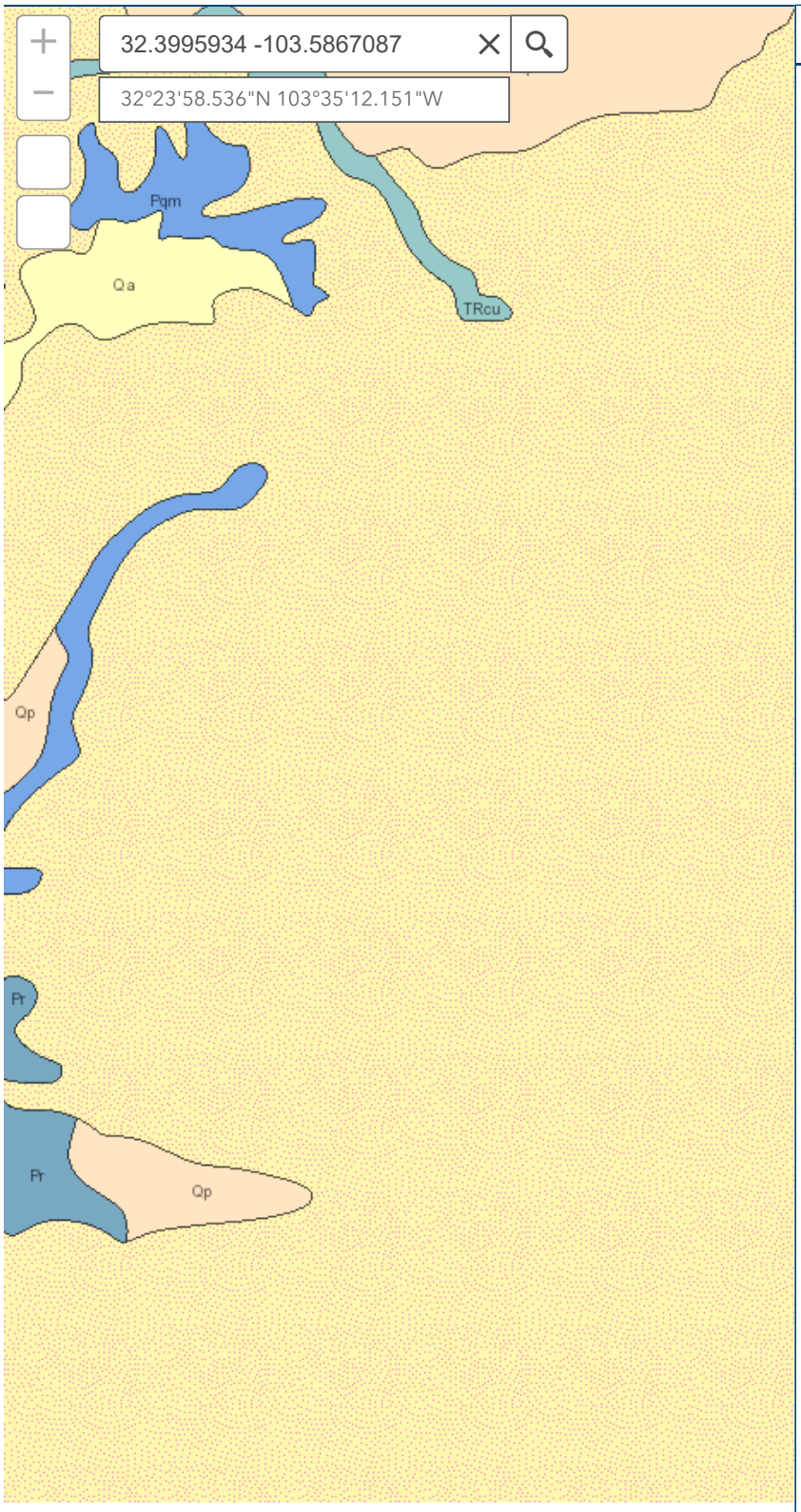
16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management 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:** Mesquite, pricklypear, and broom snakeweed can become invasive.

---

17. **Perennial plant reproductive capability:** All plant species should be capable of reproduction except during periods of prolonged drought conditions, heavy natural herbivory or intense wildfires.

Received by OCD: 6/5/2023 9:51:36 AM

NMBGMR Interactive Resources Map



Layer List

Layers

- Geographic_Resources
- Geologic_Resources
  - Precambrian
  - GEOCHRONOLOGY
  - Geologic Maps at 1:24,000 Scale
  - Geologic Maps at Other Scales
  - State Geologic Map 1:500,000
  - Quaternary Faults
  - Valles Caldera at 1:50,000 Scale
- Water_Resources
- Energy_Resources
- Mineral_Resources
- Recreation_Resources

App State

Click to restore the map extent and layers visibility where you left off.

Released to Imaging: 1/24/2024 3:01:10 PM

APPENDIX C – Daily Field Report

Daily Site Visit Report

Client:	Marathon Oil Permian LLC	Inspection Date:	5/2/2023
Site Location Name:	Chili Parlor 2H 3H CTB	Report Run Date:	5/4/2023 1:24 PM
Client Contact Name:	Isaac Castro	API #:	
Client Contact Phone #:	(575) 988-0561		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	5/2/2023 9:45 AM
Departed Site	5/2/2023 3:00 PM

Field Notes

10:02 On site to collect confirmation samples for the release at the flare. The release has already been scraped and backfilled.

10:02 Samples will be collected from 12 base sample points at 0’ and 1’ bgs. Four wall samples will be collected around the impacted area.

12:24 All samples have field screened under strictest criteria for chlorides with titration.

14:07 All samples field screened under strictest criteria for TPH with PetroFlag

Next Steps & Recommendations

1 Send samples to lab for confirmation. All surface samples will be sent for analysis while the 1’ samples will be on hold

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest

Sample area

Viewing Direction: Southeast

Sample area

Viewing Direction: Northeast

Sample area

Viewing Direction: Northwest

Sample area

Daily Site Visit Report

Viewing Direction: Southwest

Sample area

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Chance Dixon

Signature: 

Signature

APPENDIX D – Notification

From: Sanjari, Melodie (MRO)
To: spills@slo.state.nm.us; OCDOnline@state.nm.us
Cc: bgriffin@slo.state.nm.us
Subject: Marathon Oil Company - Sampling Notice - Chili Parlor CTB nAPP2311239328

Good Afternoon,

Please let this email serve as the required sampling notification for confirmation sampling to occur alongside remediation next Tuesday at 9am at the Chili Parlor CTB location.

Thank you

Melodie Sanjari
Environmental Professional
Permian & Oklahoma
575-988-8753

From: Sanjari, Melodie (MRO)
Sent: Wednesday, April 26, 2023 3:51 PM
To: Mann, Ryan <rmann@slo.state.nm.us>; spills@slo.state.nm.us
Subject: Marathon Oil Company - Initial C141 - Chili Parlor CTB nAPP2311239328

Please find the attached initial C141 on this incident.

Melodie Sanjari
Environmental Professional
Permian & Oklahoma
575-988-8753

From: Sanjari, Melodie (MRO)
Sent: Saturday, April 22, 2023 12:15 PM
To: Mann, Ryan <rmann@slo.state.nm.us>
Subject: Marathon Oil Company - Initial Notification - Chili Parlor CTB nAPP2311239328

Good Morning Sir,

Please let this email serve as the notification for a fire that occurred on the Chili Parlor CTB location

this morning. The fire was immediately extinguished leaving a charred area around the base of the flare. Remediation and initial sampling will commence next week and an Initial C141 will be forwarded on upon submission.

Thank you

Melodie Sanjari
Environmental Professional
Permian & Oklahoma
575-988-8753

From: OCDOnline@state.nm.us <OCDOnline@state.nm.us>
Sent: Saturday, April 22, 2023 11:56 AM
To: Sanjari, Melodie (MRO) <msanjari@marathonoil.com>
Subject: [External] The Oil Conservation Division (OCD) has accepted the application, Application ID: 209838

Beware of links/attachments.

To whom it may concern (c/o Melodie Sanjari for MARATHON OIL PERMIAN LLC),

The OCD has accepted the submitted *Notification of a release* (NOR), for incident ID (n#) nAPP2311239328,
with the following conditions:

- **When submitting future reports regarding this release, please submit the calculations used or specific justification for the volumes reported on the initial C-141.**

Please reference nAPP2311239328, on all subsequent C-141 submissions and communications regarding the remediation of this release.
NOTE: As of December 2019, NMOCD has discontinued the use of the "RP" number.
If you have any questions regarding this application, or don't know why you have received this email, please contact us.

ocd.enviro@state.nm.us

New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

APPENDIX E – Laboratory Data Report and Chain of Custody Form

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

May 31, 2023

Chance Dixon

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

RE: Chili Parlor 2H 3H CTB OrderNo.: 2305755

Dear Chance Dixon:

Hall Environmental Analysis Laboratory received 16 sample(s) on 5/13/2023 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-01 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:17:00 AM
Lab ID: 2305755-001 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	5/16/2023 5:43:09 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/16/2023 5:43:09 PM
Surr: DNOP	73.9	69-147		%Rec	1	5/16/2023 5:43:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0	H	mg/Kg	1	5/19/2023 1:48:00 PM
Surr: BFB	82.8	15-244	H	%Rec	1	5/19/2023 1:48:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 1:48:00 PM
Toluene	ND	0.050	H	mg/Kg	1	5/19/2023 1:48:00 PM
Ethylbenzene	ND	0.050	H	mg/Kg	1	5/19/2023 1:48:00 PM
Xylenes, Total	ND	0.10	H	mg/Kg	1	5/19/2023 1:48:00 PM
Surr: 4-Bromofluorobenzene	99.7	39.1-146	H	%Rec	1	5/19/2023 1:48:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	61		mg/Kg	20	5/19/2023 10:52:52 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-02 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:21:00 AM
Lab ID: 2305755-002 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	5/16/2023 6:06:56 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/16/2023 6:06:56 PM
Surr: DNOP	74.2	69-147		%Rec	1	5/16/2023 6:06:56 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0	H	mg/Kg	1	5/19/2023 2:11:25 PM
Surr: BFB	80.5	15-244	H	%Rec	1	5/19/2023 2:11:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 2:11:25 PM
Toluene	ND	0.050	H	mg/Kg	1	5/19/2023 2:11:25 PM
Ethylbenzene	ND	0.050	H	mg/Kg	1	5/19/2023 2:11:25 PM
Xylenes, Total	ND	0.099	H	mg/Kg	1	5/19/2023 2:11:25 PM
Surr: 4-Bromofluorobenzene	101	39.1-146	H	%Rec	1	5/19/2023 2:11:25 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 11:05:17 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES23-03 0.5'
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 10:25:00 AM
Lab ID: 2305755-003 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	23	9.6		mg/Kg	1	5/16/2023 6:30:46 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/16/2023 6:30:46 PM
Surr: DNOP	75.7	69-147		%Rec	1	5/16/2023 6:30:46 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8	H	mg/Kg	1	5/19/2023 2:34:46 PM
Surr: BFB	76.0	15-244	H	%Rec	1	5/19/2023 2:34:46 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 2:34:46 PM
Toluene	ND	0.048	H	mg/Kg	1	5/19/2023 2:34:46 PM
Ethylbenzene	ND	0.048	H	mg/Kg	1	5/19/2023 2:34:46 PM
Xylenes, Total	ND	0.097	H	mg/Kg	1	5/19/2023 2:34:46 PM
Surr: 4-Bromofluorobenzene	102	39.1-146	H	%Rec	1	5/19/2023 2:34:46 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 11:17:42 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-04 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:31:00 AM
Lab ID: 2305755-004 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	280	9.7		mg/Kg	1	5/16/2023 6:54:38 PM
Motor Oil Range Organics (MRO)	180	48		mg/Kg	1	5/16/2023 6:54:38 PM
Surr: DNOP	81.0	69-147		%Rec	1	5/16/2023 6:54:38 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.6	H	mg/Kg	1	5/19/2023 2:58:05 PM
Surr: BFB	97.2	15-244	H	%Rec	1	5/19/2023 2:58:05 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023	H	mg/Kg	1	5/19/2023 2:58:05 PM
Toluene	ND	0.046	H	mg/Kg	1	5/19/2023 2:58:05 PM
Ethylbenzene	ND	0.046	H	mg/Kg	1	5/19/2023 2:58:05 PM
Xylenes, Total	ND	0.092	H	mg/Kg	1	5/19/2023 2:58:05 PM
Surr: 4-Bromofluorobenzene	103	39.1-146	H	%Rec	1	5/19/2023 2:58:05 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 11:30:07 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-05 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:33:00 AM
Lab ID: 2305755-005 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	33	8.7		mg/Kg	1	5/17/2023 5:10:14 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	5/17/2023 5:10:14 PM
Surr: DNOP	72.3	69-147		%Rec	1	5/17/2023 5:10:14 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0	H	mg/Kg	1	5/19/2023 3:21:25 PM
Surr: BFB	66.9	15-244	H	%Rec	1	5/19/2023 3:21:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 3:21:25 PM
Toluene	ND	0.050	H	mg/Kg	1	5/19/2023 3:21:25 PM
Ethylbenzene	ND	0.050	H	mg/Kg	1	5/19/2023 3:21:25 PM
Xylenes, Total	ND	0.10	H	mg/Kg	1	5/19/2023 3:21:25 PM
Surr: 4-Bromofluorobenzene	98.9	39.1-146	H	%Rec	1	5/19/2023 3:21:25 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	59		mg/Kg	20	5/19/2023 11:42:32 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-06 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:35:00 AM
Lab ID: 2305755-006 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	29	9.7		mg/Kg	1	5/16/2023 7:42:09 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/16/2023 7:42:09 PM
Surr: DNOP	74.0	69-147		%Rec	1	5/16/2023 7:42:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 4:08:13 PM
Surr: BFB	65.2	15-244	H	%Rec	1	5/19/2023 4:08:13 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 4:08:13 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 4:08:13 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 4:08:13 PM
Xylenes, Total	ND	0.097	H	mg/Kg	1	5/19/2023 4:08:13 PM
Surr: 4-Bromofluorobenzene	97.7	39.1-146	H	%Rec	1	5/19/2023 4:08:13 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	59		mg/Kg	20	5/19/2023 11:54:57 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES23-07 0.5'
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 10:39:00 AM
Lab ID: 2305755-007 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	28	9.8		mg/Kg	1	5/16/2023 8:05:50 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/16/2023 8:05:50 PM
Surr: DNOP	74.5	69-147		%Rec	1	5/16/2023 8:05:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0	H	mg/Kg	1	5/19/2023 4:31:43 PM
Surr: BFB	67.2	15-244	H	%Rec	1	5/19/2023 4:31:43 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 4:31:43 PM
Toluene	ND	0.050	H	mg/Kg	1	5/19/2023 4:31:43 PM
Ethylbenzene	ND	0.050	H	mg/Kg	1	5/19/2023 4:31:43 PM
Xylenes, Total	ND	0.099	H	mg/Kg	1	5/19/2023 4:31:43 PM
Surr: 4-Bromofluorobenzene	98.2	39.1-146	H	%Rec	1	5/19/2023 4:31:43 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/20/2023 12:07:22 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-08 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:43:00 AM
Lab ID: 2305755-008 **Matrix:** SOIL
Received Date: 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	34	9.4		mg/Kg	1	5/16/2023 8:29:31 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	5/16/2023 8:29:31 PM
Surr: DNOP	74.4	69-147		%Rec	1	5/16/2023 8:29:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 4:55:06 PM
Surr: BFB	75.0	15-244	H	%Rec	1	5/19/2023 4:55:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 4:55:06 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 4:55:06 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 4:55:06 PM
Xylenes, Total	ND	0.099	H	mg/Kg	1	5/19/2023 4:55:06 PM
Surr: 4-Bromofluorobenzene	102	39.1-146	H	%Rec	1	5/19/2023 4:55:06 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/20/2023 12:19:47 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-09 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:47:00 AM
Lab ID: 2305755-009 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	32	9.3		mg/Kg	1	5/16/2023 10:04:29 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/16/2023 10:04:29 PM
Surr: DNOP	77.4	69-147		%Rec	1	5/16/2023 10:04:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 5:18:29 PM
Surr: BFB	70.5	15-244	H	%Rec	1	5/19/2023 5:18:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 5:18:29 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 5:18:29 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 5:18:29 PM
Xylenes, Total	ND	0.097	H	mg/Kg	1	5/19/2023 5:18:29 PM
Surr: 4-Bromofluorobenzene	99.6	39.1-146	H	%Rec	1	5/19/2023 5:18:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	59		mg/Kg	20	5/20/2023 12:32:11 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BES23-10 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 10:51:00 AM
Lab ID: 2305755-010 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	29	10		mg/Kg	1	5/16/2023 10:28:15 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/16/2023 10:28:15 PM
Surr: DNOP	86.5	69-147		%Rec	1	5/16/2023 10:28:15 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 5:41:44 PM
Surr: BFB	68.4	15-244	H	%Rec	1	5/19/2023 5:41:44 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 5:41:44 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 5:41:44 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 5:41:44 PM
Xylenes, Total	ND	0.098	H	mg/Kg	1	5/19/2023 5:41:44 PM
Surr: 4-Bromofluorobenzene	99.6	39.1-146	H	%Rec	1	5/19/2023 5:41:44 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	5/22/2023 4:15:40 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES23-11 0.5'
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 10:55:00 AM
Lab ID: 2305755-011 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	50	9.7		mg/Kg	1	5/16/2023 10:52:01 PM
Motor Oil Range Organics (MRO)	59	49		mg/Kg	1	5/16/2023 10:52:01 PM
Surr: DNOP	86.9	69-147		%Rec	1	5/16/2023 10:52:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.7	H	mg/Kg	1	5/19/2023 6:05:05 PM
Surr: BFB	62.8	15-244	H	%Rec	1	5/19/2023 6:05:05 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 6:05:05 PM
Toluene	ND	0.047	H	mg/Kg	1	5/19/2023 6:05:05 PM
Ethylbenzene	ND	0.047	H	mg/Kg	1	5/19/2023 6:05:05 PM
Xylenes, Total	ND	0.094	H	mg/Kg	1	5/19/2023 6:05:05 PM
Surr: 4-Bromofluorobenzene	97.5	39.1-146	H	%Rec	1	5/19/2023 6:05:05 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	ND	60		mg/Kg	20	5/22/2023 4:28:05 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BES23-12 0.5'
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 10:59:00 AM
Lab ID: 2305755-012 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	43	9.7		mg/Kg	1	5/16/2023 11:15:50 PM
Motor Oil Range Organics (MRO)	53	49		mg/Kg	1	5/16/2023 11:15:50 PM
Surr: DNOP	84.5	69-147		%Rec	1	5/16/2023 11:15:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 6:28:32 PM
Surr: BFB	72.0	15-244	H	%Rec	1	5/19/2023 6:28:32 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 6:28:32 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 6:28:32 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 6:28:32 PM
Xylenes, Total	ND	0.098	H	mg/Kg	1	5/19/2023 6:28:32 PM
Surr: 4-Bromofluorobenzene	100	39.1-146	H	%Rec	1	5/19/2023 6:28:32 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 8:12:17 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES23-01 0.5
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 11:07:00 AM
Lab ID: 2305755-013 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	44	9.5		mg/Kg	1	5/16/2023 11:39:39 PM
Motor Oil Range Organics (MRO)	52	47		mg/Kg	1	5/16/2023 11:39:39 PM
Surr: DNOP	85.7	69-147		%Rec	1	5/16/2023 11:39:39 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0	H	mg/Kg	1	5/19/2023 6:51:55 PM
Surr: BFB	64.7	15-244	H	%Rec	1	5/19/2023 6:51:55 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 6:51:55 PM
Toluene	ND	0.050	H	mg/Kg	1	5/19/2023 6:51:55 PM
Ethylbenzene	ND	0.050	H	mg/Kg	1	5/19/2023 6:51:55 PM
Xylenes, Total	ND	0.10	H	mg/Kg	1	5/19/2023 6:51:55 PM
Surr: 4-Bromofluorobenzene	98.6	39.1-146	H	%Rec	1	5/19/2023 6:51:55 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	350	60		mg/Kg	20	5/19/2023 8:49:30 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-02 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 11:11:00 AM
Lab ID: 2305755-014 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	43	9.3		mg/Kg	1	5/17/2023 12:03:29 AM
Motor Oil Range Organics (MRO)	49	47		mg/Kg	1	5/17/2023 12:03:29 AM
Surr: DNOP	86.8	69-147		%Rec	1	5/17/2023 12:03:29 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.7	H	mg/Kg	1	5/19/2023 7:15:11 PM
Surr: BFB	70.2	15-244	H	%Rec	1	5/19/2023 7:15:11 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 7:15:11 PM
Toluene	ND	0.047	H	mg/Kg	1	5/19/2023 7:15:11 PM
Ethylbenzene	ND	0.047	H	mg/Kg	1	5/19/2023 7:15:11 PM
Xylenes, Total	ND	0.095	H	mg/Kg	1	5/19/2023 7:15:11 PM
Surr: 4-Bromofluorobenzene	99.5	39.1-146	H	%Rec	1	5/19/2023 7:15:11 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 9:26:45 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** WES23-03 0.5'
Project: Chili Parlor 2H 3H CTB **Collection Date:** 5/2/2023 11:15:00 AM
Lab ID: 2305755-015 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/17/2023 12:27:18 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/17/2023 12:27:18 AM
Surr: DNOP	84.6	69-147		%Rec	1	5/17/2023 12:27:18 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8	H	mg/Kg	1	5/19/2023 7:38:28 PM
Surr: BFB	72.3	15-244	H	%Rec	1	5/19/2023 7:38:28 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024	H	mg/Kg	1	5/19/2023 7:38:28 PM
Toluene	ND	0.048	H	mg/Kg	1	5/19/2023 7:38:28 PM
Ethylbenzene	ND	0.048	H	mg/Kg	1	5/19/2023 7:38:28 PM
Xylenes, Total	ND	0.097	H	mg/Kg	1	5/19/2023 7:38:28 PM
Surr: 4-Bromofluorobenzene	101	39.1-146	H	%Rec	1	5/19/2023 7:38:28 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 9:39:09 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2305755**
Date Reported: **5/31/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WES23-04 0.5'
Project: Chili Parlor 2H 3H CTB
Collection Date: 5/2/2023 11:19:00 AM
Lab ID: 2305755-016 **Matrix:** SOIL **Received Date:** 5/13/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	5/17/2023 12:51:07 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/17/2023 12:51:07 AM
Surr: DNOP	87.4	69-147		%Rec	1	5/17/2023 12:51:07 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9	H	mg/Kg	1	5/19/2023 8:48:40 PM
Surr: BFB	62.2	15-244	H	%Rec	1	5/19/2023 8:48:40 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025	H	mg/Kg	1	5/19/2023 8:48:40 PM
Toluene	ND	0.049	H	mg/Kg	1	5/19/2023 8:48:40 PM
Ethylbenzene	ND	0.049	H	mg/Kg	1	5/19/2023 8:48:40 PM
Xylenes, Total	ND	0.098	H	mg/Kg	1	5/19/2023 8:48:40 PM
Surr: 4-Bromofluorobenzene	98.6	39.1-146	H	%Rec	1	5/19/2023 8:48:40 PM
EPA METHOD 300.0: ANIONS						Analyst: **JTT**
Chloride	ND	60		mg/Kg	20	5/19/2023 10:16:23 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2305755**

31-May-23

Client: Vertex Resources Services, Inc.

Project: Chili Parlor 2H 3H CTB

Sample ID: **MB-75067**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **75067**	RunNo: **96890**							
Prep Date: **5/19/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514791**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-75067**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **75067**	RunNo: **96890**							
Prep Date: **5/19/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514792**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.3	90	110			

Sample ID: **MB-75068**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **75068**	RunNo: **96891**							
Prep Date: **5/19/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514873**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-75068**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **75068**	RunNo: **96891**							
Prep Date: **5/19/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514874**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.5	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2305755**

31-May-23

Client: Vertex Resources Services, Inc.

Project: Chili Parlor 2H 3H CTB

Sample ID: **MB-74975**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **74975**	RunNo: **96800**
Prep Date: **5/16/2023**	Analysis Date: **5/16/2023**	SeqNo: **3510665** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	7.1		10.00		71.0	69	147			

Sample ID: **LCS-74975**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **74975**	RunNo: **96800**
Prep Date: **5/16/2023**	Analysis Date: **5/16/2023**	SeqNo: **3510666** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	85.1	61.9	130			
Surr: DNOP	3.9		5.000		78.7	69	147			

Sample ID: **2305755-008AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BES23-08 0.5'**	Batch ID: **74975**	RunNo: **96800**
Prep Date: **5/16/2023**	Analysis Date: **5/16/2023**	SeqNo: **3510675** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	74	9.4	46.82	34.12	84.7	54.2	135			
Surr: DNOP	3.9		4.682		82.8	69	147			

Sample ID: **2305755-008AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BES23-08 0.5'**	Batch ID: **74975**	RunNo: **96800**
Prep Date: **5/16/2023**	Analysis Date: **5/16/2023**	SeqNo: **3510676** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	65	9.6	48.17	34.12	64.5	54.2	135	12.4	29.2	
Surr: DNOP	3.9		4.817		80.8	69	147	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2305755**

31-May-23

Client: Vertex Resources Services, Inc.

Project: Chili Parlor 2H 3H CTB

Sample ID: **lcs-74950**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **74950**	RunNo: **96874**
Prep Date: **5/15/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514220** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.7	70	130			
Surr: BFB	5000		1000		497	15	244			S

Sample ID: **mb-74950**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **74950**	RunNo: **96874**
Prep Date: **5/15/2023**	Analysis Date: **5/19/2023**	SeqNo: **3514221** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	720		1000		72.2	15	244			

Sample ID: **2305755-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BES23-01 0.5'**	Batch ID: **74950**	RunNo: **96874**
Prep Date: **5/15/2023**	Analysis Date: **5/19/2023**	SeqNo: **3515506** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	24.80	0	89.5	70	130			H
Surr: BFB	4600		992.1		464	15	244			SH

Sample ID: **2305755-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BES23-01 0.5'**	Batch ID: **74950**	RunNo: **96874**
Prep Date: **5/15/2023**	Analysis Date: **5/19/2023**	SeqNo: **3515507** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	24.88	0	85.4	70	130	4.37	20	H
Surr: BFB	4500		995.0		457	15	244	0	0	SH

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2305755**

31-May-23

Client: Vertex Resources Services, Inc.

Project: Chili Parlor 2H 3H CTB

Sample ID: **LCS-74950** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **74950** RunNo: **96874**

Prep Date: **5/15/2023** Analysis Date: **5/19/2023** SeqNo: **3514224** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.6	70	130			
Toluene	0.96	0.050	1.000	0	95.6	70	130			
Ethylbenzene	0.97	0.050	1.000	0	97.4	70	130			
Xylenes, Total	2.9	0.10	3.000	0	97.4	70	130			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	39.1	146			

Sample ID: **mb-74950** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **74950** RunNo: **96874**

Prep Date: **5/15/2023** Analysis Date: **5/19/2023** SeqNo: **3514225** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.99		1.000		99.1	39.1	146			

Sample ID: **2305755-002ams** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **BES23-02 0.5'** Batch ID: **74950** RunNo: **96874**

Prep Date: **5/15/2023** Analysis Date: **5/19/2023** SeqNo: **3515603** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	0.9852	0	92.9	70	130			H
Toluene	0.94	0.049	0.9852	0	95.3	70	130			H
Ethylbenzene	0.95	0.049	0.9852	0	96.0	70	130			H
Xylenes, Total	2.9	0.099	2.956	0	96.5	70	130			H
Surr: 4-Bromofluorobenzene	1.0		0.9852		105	39.1	146			H

Sample ID: **2305755-002amsd** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **BES23-02 0.5'** Batch ID: **74950** RunNo: **96874**

Prep Date: **5/15/2023** Analysis Date: **5/19/2023** SeqNo: **3515604** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.025	0.9814	0	86.5	70	130	7.51	20	H
Toluene	0.87	0.049	0.9814	0	88.8	70	130	7.41	20	H
Ethylbenzene	0.90	0.049	0.9814	0	91.3	70	130	5.45	20	H
Xylenes, Total	2.7	0.098	2.944	0	90.5	70	130	6.88	20	H
Surr: 4-Bromofluorobenzene	1.0		0.9814		103	39.1	146	0	0	H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

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HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Vertex Resources Services, Inc.

Work Order Number: 2305755

RcptNo: 1

Received By: Juan Rojas 5/13/2023 7:30:00 AM

Completed By: Juan Rojas 5/13/2023 8:57:48 AM

Reviewed By: TMC 5/13/23

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

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

Adjusted? _____

Checked by: JR 5/13/23

Special Handling (if applicable)

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

Person Notified: _____ Date _____

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

Regarding: _____

Client Instructions: _____

16. Additional remarks:

Client missing mailing address, phone number and email address on COC. JR 5/13/223

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.9	Good	No	Morty		

Received by OCD: 6/5/2023 9:51:36 AM

Released to Imaging: 1/24/2024 3:01:10 PM

Received by OCD: 6/5/2023 9:51:36 AM

Chain-of-Custody Record

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

Client: Marathon / Vertex

Mailing Address: On File

Phone #:

email or Fax#:

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

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

Turn-Around Time: ~~Std~~ 5-Day
~~☐ Standard~~ ~~☐ Rush~~

Project Name: Chili Parlor 2H 3H CTB

Project #: 23E-02431

Project Manager: Chance Dixon

Sampler: CD

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CF): 4.0-0=4.9 (°C)

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2305755	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)						
5/12/23	10:17	Soil	BES23-01 0.5'	4oz	Ice	-001	✓	✓					✓									
	10:21		BES23-02 0.5'			-002																
	10:25		BES23-03 0.5'			-003																
	10:31		BES23-04 0.5'			-004																
	10:33		BES23-05 0.5'			-005																
	10:35		BES23-06 0.5'			-006																
	10:39		BES23-07 0.5'			-007																
	10:43		BES23-08 0.5'			-008																
	10:47		BES23-09 0.5'			-009																
	10:51		BES23-10 0.5'			-010																
	10:55		BES23-11 0.5'			-011																
	10:59		BES23-12 0.5'			-012																

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
5/12	10:35	[signature]	[signature]		5/12/23	1035
5/12/23	1900	[signature]	[signature]	Courier	5/12/23	7130

Remarks: cc: Chance Dixon
Direct Bill Melodie Sanjari
Hold time expires 5/16

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.

Released to Imaging: 1/24/2024 3:01:10 PM

Chain-of-Custody Record

Client: Marathon / Vertex

Mailing Address: On File

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☑ Rush 5 Day

Project Name: Chili Parlor ZH 3H CTB

Project #: 23E-02431

Project Manager: Chance Dixon

Sampler: CD

On Ice: ☑ Yes ☐ No

# of Coolers: 1 Marty

Cooler Temp(including CF): 4.9-0.2=4.9 (°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. 2305755	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)
5/12/23	11:07	Soil	WES23-01 0.5'	4 oz	Ice	-013	✓	✓					✓			
	11:11		WES23-02 0.5'			-014										
	11:15		WES23-03 0.5'			-015										
	11:19		WES23-04 0.5'			-016										

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
5/12	10:35				5/12/23	1035
5/12/23	1900				5/12/23	7:30

Remarks: CC: Chance Dixon
Direct Bill: Meiodia Sanjari
Hold time expires 5/16.

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

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

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

CONDITIONS

Action 223770

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 223770
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
scwells	Remediation Closure approved. All areas not reasonably needed for production or subsequent drilling operations will need to be reclaimed and revegetated as soon as practical. Areas reasonably needed for production or subsequent drilling operations will need to be reclaimed and revegetated as soon as they are no longer reasonably needed. A report for reclamation and revegetation will need to be submitted and approved prior to this incident receiving the final status of "Restoration Complete".	1/24/2024