Incident Numbers: nOY1711437340 and nOY1701037701

Release Assessment and Closure

State 2 8016 JV-P #001

Section 02, Township 23 South, Range 34 East

API: 30-025-27486

County: Lea

Vertex File Number: 24E-02760

Prepared for:
BTA Oil Producers, LLC

Prepared by:
Vertex Resource Services Inc.

Date:
June 2024

Release Assessment and Closure
State 2 8016 JV-P #001
Section 02, Township 23 South, Range 34 East
API: 30-025-27486
County: Lea

Prepared for:
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Date

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1.0 Introduction

BTA Oil Producers, LLC (BTA) retained Vertex Resource Services Inc. (Vertex) to conduct a Release Assessment and Closure for two separate produced water releases that occurred at State 2 8016 JV-P #001, API 30-025-27486 (hereafter referred to as the "site"). Incident ID numbers nOY1711437340 and nOY1701037701 were assigned to this incident. BTA submitted an initial C-141 Release Notification to New Mexico Oil Conservation Division (NMOCD) District 2 on April 24, 2017, for nOY1711437340. An initial C-141 could not be found for nOY1701037701.

This report describes the release assessment 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 is complete.

2.0 Incident Descriptions

nOY1711437340

One of the two releases occurred on April 24, 2017, due to the overflow of a storage tank and involved the release of approximately 50 barrels (bbl.) of produced water, and 5 bbl. of oil onto pad. Approximately 55 bbl. of free fluid was removed during the initial clean-up. Additional details relevant to the release are presented in the C-141 Report found on NMOCD Permitting.

nOY1701037701

The second of the two releases occurred does not have an accurate release date. The date found on NMOCD is January 1, 1800. NMOCD Permitting does not depict any details pertaining to the severity of the incident, nor does it show any corrective actions. The volume of the release shows to be 0 bbl. of all possible material.

3.0 Site Characteristics

The site is located approximately 18.5 miles southwest of Eunice, New Mexico (Google Inc., 2024). The legal location for the site is Section 02, Township 23 South and Range 34 East in Lea County, New Mexico. The release area is located on State property. An aerial photograph and site schematic are presented on Figure 1.

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2024) indicates the site's surface geology primarily comprises Qep - Eolian and piedmont deposits (Holocene to middle Pleistocene) — Interlayed eolian sands and piedmont-slope deposits. The predominant soil texture on site is fine sandy loams. The soil at the site is characterized as Pyote and Maljamar fine sands and Ratliff-Wink fine sandy loams (United States Department of Agriculture, Natural Resources Conservation Service, 2024). Additional soil characteristics include a well-drained drainage class with a runoff class of very low to negligible. 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 release area at 32.3282013 -103.4429626 (Figure 1).

The surrounding landscape is associated with upland landforms, mainly on hill slopes, ridges, plains, terraces, and some fan remnants with elevations ranging between 2,842 and 5,000 feet. The climate is semiarid with average annual precipitation ranging between 8 and 14 inches. Using information from the United States Department of Agriculture, the historic plant community has a grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. The dominant species are Tobosa, black grama, and blue grama (United States Department of Agriculture, Natural Resources Conservation Service, 2024).

4.0 Closure Criteria Determination

The nearest active well to the site is a New Mexico Office of the State Engineer (NMOSE) monitoring well located approximately 0.39 miles southwest of the site (New Mexico Office of the State Engineer, 2024). Data from 2023 show the NMOSE borehole recorded a depth to groundwater of 285 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 the Pecos River (National Wetlands Inventory) located approximately 22.26 miles west and southwest of the site (United States Fish and Wildlife Service, 2024).

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

Closure Criteria Determination			
Site Name: State 2 8016 JV-P #001			
Spill Coordinates: 32.3282013 -103.4429626		**X: UTM easting**	**Y: UTM northing**
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater (nearest reference)	**285**	feet
	Distance between release and nearest DTGW reference	**2,040**	feet
		0.39	miles
	Date of nearest DTGW reference measurement	**November 2, 2023**	
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	171,557	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	116,338	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	29,783	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**		feet
	ii) Within 1000 feet of any fresh water well or spring	2,000	feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	10,396	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
	Distance between release and nearest registered mine	**121,268**	feet
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low
	Distance between release and nearest unstable area	116,583	feet
10	Within a 100-year Floodplain	Zone D shaded	year
	Distance between release and nearest FEMA Zone A (100-year Floodplain)	**122,555**	feet
11	Soil Type	MN and PU	
12	Ecological Classification	Ratliff	
13	Geology	Qep	
	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 to Remediation & Reclamation Standards

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

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

5.0 Site Assessment

An assessment of the release area was completed on May 31, 2024, which identified the area of the releases. The impacted area was determined to be in the area of where the containment for the tank battery was stationed before being decommissioned. The Daily Field Report associated with the site inspection is included in Appendix C.

Field screening was completed on a total of three sample points (boreholes) at one-foot increments from the surface to four feet bgs and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and Silver Nitrate Titration (chlorides). Field screening results depicted no exceedances to NMOCD's strictest closure criteria.

Notification that confirmatory samples were being collected was provided to the NMOCD on May 29, 2024, and is included in Appendix C. A total of 15 samples were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to Cardinal Laboratories 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 report is included in Appendix E. All confirmatory samples collected and analyzed were below closure criteria for the site.

6.0 Closure Request

Vertex recommends no additional action to the site. Laboratory analyses of the assessment samples collected in the vicinities of the releases show final confirmatory values below NMOCD closure criteria for areas where depth to groundwater is less than 50 feet bgs. There are no anticipated risks to human, ecological, or hydrological receptors at the site.

Vertex requests that these incidents (nOY1711437340 and nOY1701037701) be approved for remediation as all closure requirements set forth at the time were met, and there are no standing exceedances to closure criteria at the site at this time. BTA certifies that all information in this report and the appendices are 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 site.

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

7.0 References

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8.0 Limitations

This report has been prepared for the sole benefit of BTA Oil Producers, LLC. This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division and State Land Office, without the express written consent of Vertex Resource Services Inc. (Vertex) and BTA Oil Producers, LLC. 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 judgment of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

FIGURES

Borehole (Prefixed by "BH24-")

Approximate Site Boundary

VERTEX

0 25 50 100 ft

NAD 1983 UTM Zone 13N

Date: Jun 14/24

Map Center:
Lat/Long
32.328001°,-103.44284°

N

Site Assessment Schematic
State 2 8016 JV-P #001

FIGURE:
1

BTA

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

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

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects\ US PROJECTS\BTA Oil Producers LLC\2024\24E-02760 - State 2 8016 JV-P #001\Project\24E-02760.aprx

Figure 2

Historical Aerial Imagery of Containment

TABLES

Client Name: BTA Oil Producers, LLC
Site Name: State 2 8016 JV-P #001
NMOCD Tracking #: nOY1711437340
Project #: 24E-02760
Lab Report(sX): H243138

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

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Chloride Concentration	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH24-01	0	05.31.24	-	21	83	ND	ND	ND	ND	ND	ND	ND	ND
BH24-01	1	05.31.24	-	71	235	ND	ND	ND	ND	ND	ND	ND	32
BH24-01	2	05.31.24	-	63	240	ND	ND	ND	ND	ND	ND	ND	96
BH24-01	3	05.31.24	-	77	215	ND	ND	ND	ND	ND	ND	ND	368
BH24-01	4	05.31.24	-	86	203	ND	ND	ND	ND	ND	ND	ND	304
BH24-02	0	05.31.24	-	35	65	ND	ND	ND	ND	ND	ND	ND	16
BH24-02	1	05.31.24	-	**112**	236	ND	ND	ND	ND	ND	ND	ND	32
BH24-02	2	05.31.24	-	63	208	ND	ND	ND	ND	ND	ND	ND	ND
BH24-02	3	05.31.24	-	63	184	ND	ND	ND	ND	ND	ND	ND	16
BH24-02	4	05.31.24	-	45	125	ND	ND	ND	ND	ND	ND	ND	32
BH24-03	0	05.31.24	-	41	128	ND	ND	ND	ND	ND	ND	ND	16
BH24-03	1	05.31.24	-	38	135	ND	ND	ND	ND	ND	ND	ND	16
BH24-03	2	05.31.24	-	64	94	ND	ND	ND	ND	ND	ND	ND	ND
BH24-03	3	05.31.24	-	61	118	ND	ND	ND	ND	ND	ND	ND	ND
BH24-03	4	05.31.24	-	48	116	ND	ND	ND	ND	ND	ND	ND	16

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

APPENDIX A – Closure Criteria Research Documentation

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Tws	Rng	(NAD83 UTM in meters) X	Y
211FB	CP 01840 POD1	1	1	1	11	23S	34E	646007	3577597

Driller License:	1706	**Driller Company:**	ELITE DRILLERS CORPORATION		
Driller Name:	WALLACE, BRYCE J.EL.L W.				
Drill Start Date:	10/30/2023	**Drill Finish Date:**	11/02/2023	**Plug Date:**	
Log File Date:	11/08/2023	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	200 GPM
Casing Size:	8.90	**Depth Well:**	969 feet	**Depth Water:**	285 feet

Water Bearing Stratifications:	Top	Bottom	Description
	240	345	Sandstone/Gravel/Conglomerate
	345	560	Sandstone/Gravel/Conglomerate
	560	740	Sandstone/Gravel/Conglomerate
	740	969	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	360	400
	569	969

New Mexico Office of the State Engineer
Water Right Summary

get image list

WR File Number: CP 01840 **Subbasin:** CP **Cross Reference:** -

Primary Purpose: COM COMMERCIAL

Primary Status: PMT PERMIT

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

Total Diversion: 150 **Cause/Case:** -

Owner: LIMESTONE BASIN PROP RANCH LLC

Contact: JOHN LANGDON

Documents on File

Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
get images	672389	APPRO 2022-12-20	PMT	LOG	CP 01840	T	0	150	150

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 01840 POD1	211FB	Shallow	1	1	1	11	23S	34E	646007	3577597	"SECTION 11 NW WELL"

Priority Summary

Priority	Status	Acres	Diversion	Pod Number	
05/01/2020	PMT		150	CP 01840 POD1	Shallow

Place of Use

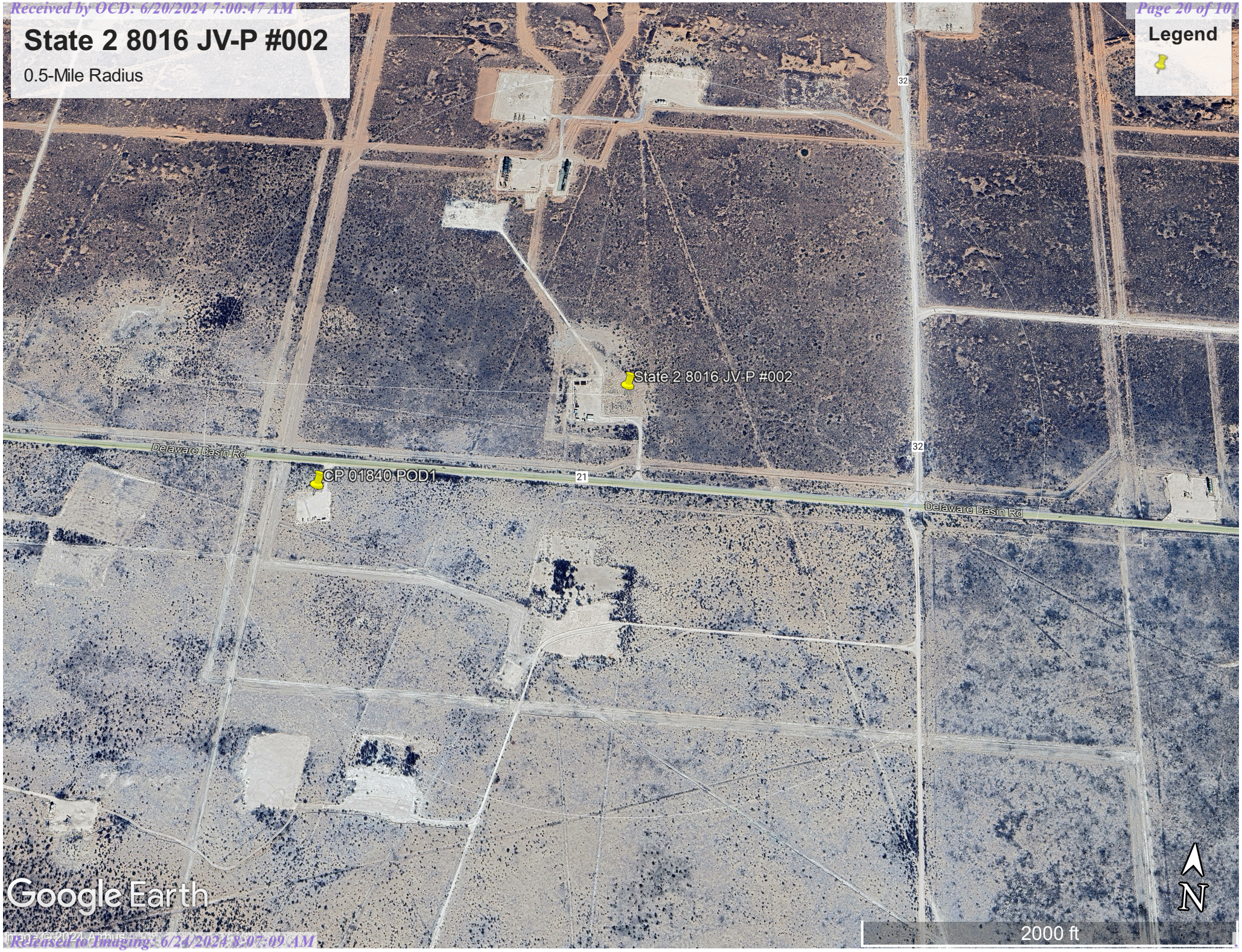
Q 256	Q 64	Q16	Q4	Sec	Tws	Rng	Acres	Diversion	CU	Use	Priority	Status	Other Location Desc
	1	1	1	11	23S	34E		150	150	COM	05/01/2020	PMT	

Source

Acres	Diversion	CU	Use	Priority	Source	Description
0	150	150	COM	05/01/2020	GW	

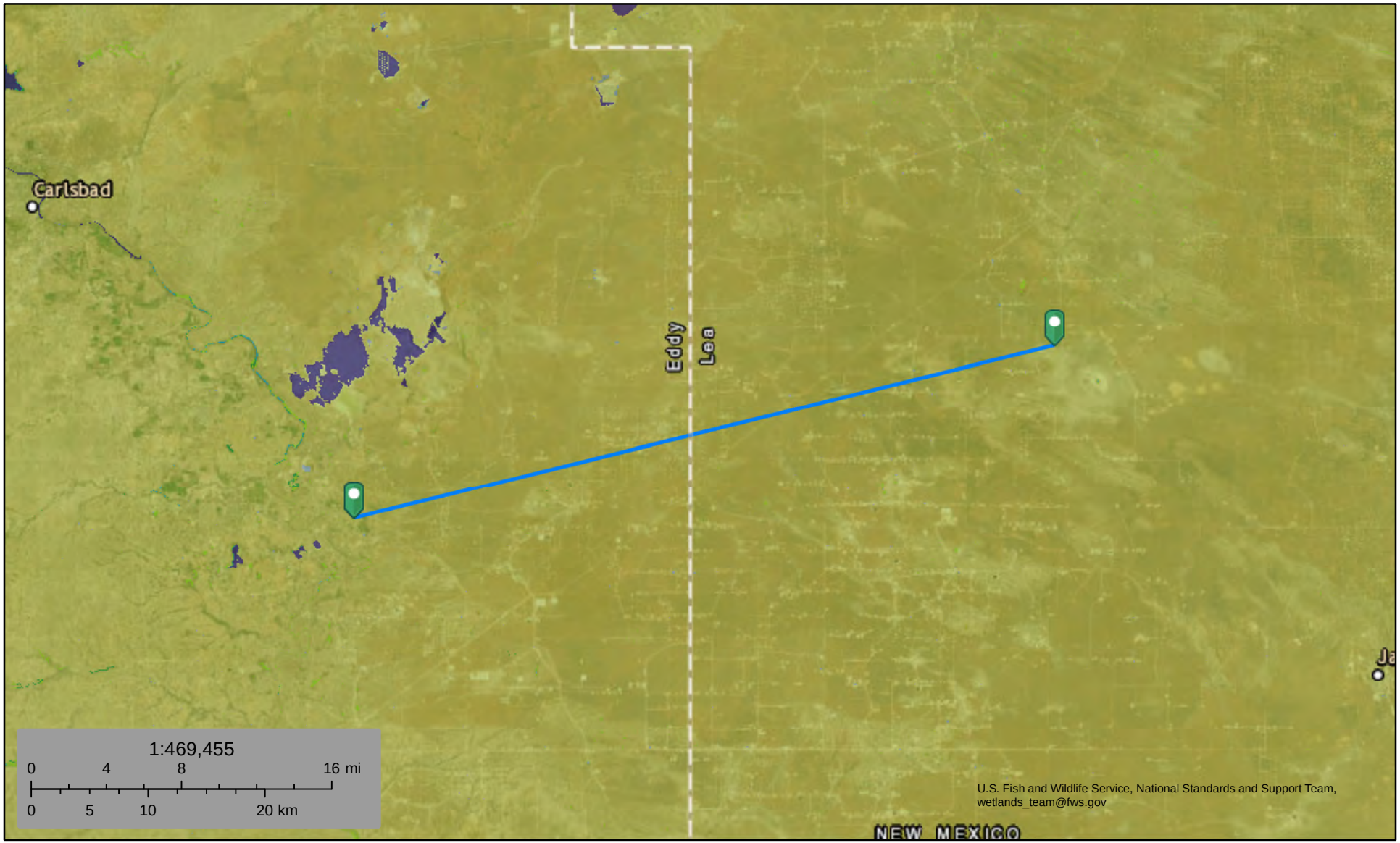
State 2 8016 JV-P #002

0.5-Mile Radius



U.S. Fish and Wildlife Service
National Wetlands Inventory

State Watercourse 171,557ft.



May 30, 2024

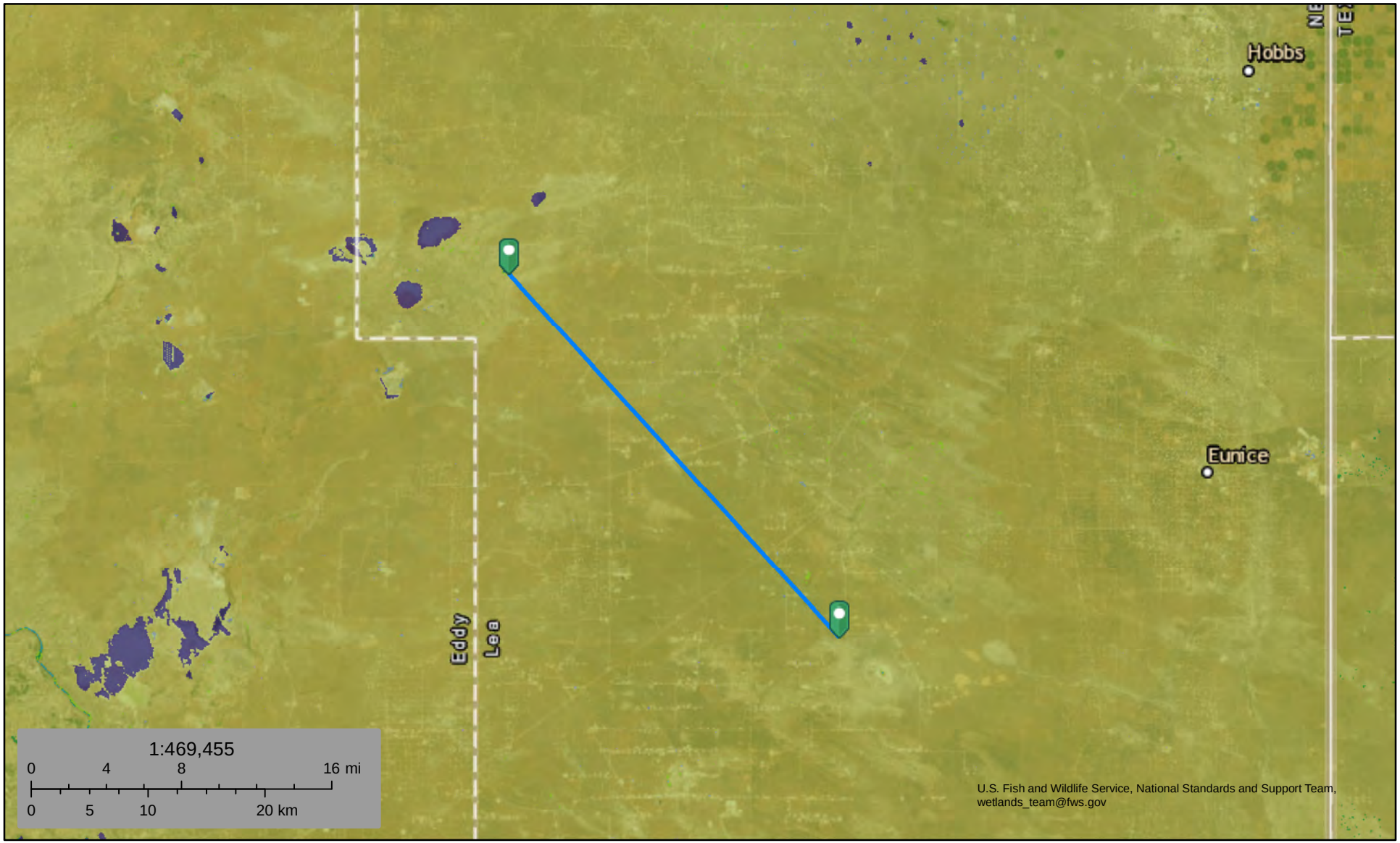
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

State Playa Lake 116,338ft.



May 30, 2024

- Estuarine and Marine Deepwater
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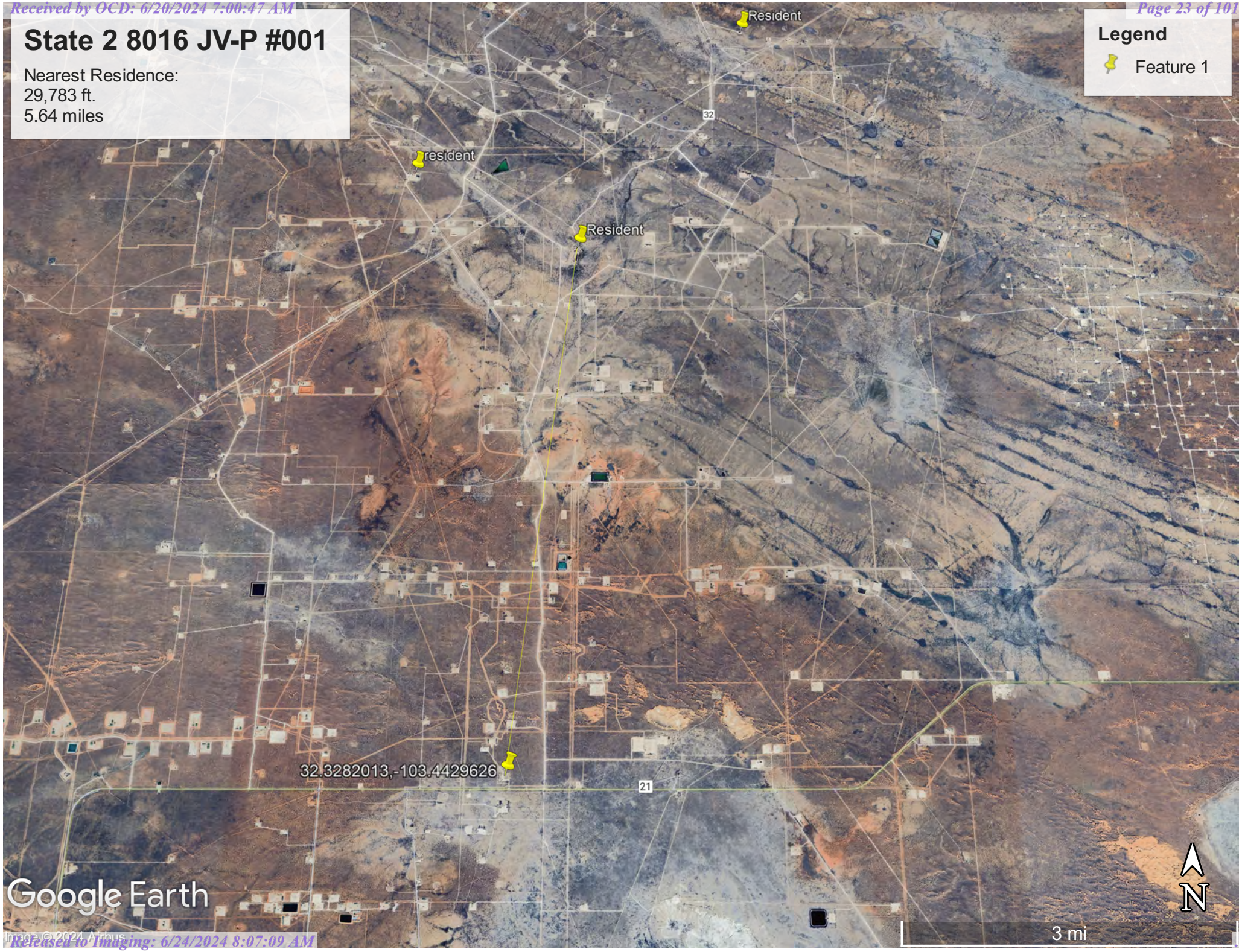
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

State 2 8016 JV-P #001

Nearest Residence:
29,783 ft.
5.64 miles



Legend
Feature 1

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum)

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 6416 4	Sec	Tws	Rng	X	Y	Distance
CP 01840	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01840 POD1	211FB			Shallow	1 1 1	11	23S	34E	646007	3577597	613
E 07616	E	MUL	3	PETE ALONZO	TO	E 07616 POD1			TOWN OF TAJIQUE	Shallow					646466	3576970	914
CP 01837	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01837 POD1	211F9			Shallow	4 1 3	11	23S	34E	646340	3576634	1263
CP 01839	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01839 POD1	211FA			Shallow	3 1 3	12	23S	34E	647594	3576634	1624
CP 01074	CP	COM	80	LIMESTONE BASIN PROPERTIES	LE	CP 01074 POD1				Shallow	4 4	35	22S	34E	647389	3579313	1659
CP 01836	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01836 POD1	211F7			Shallow	4 3 4	11	23S	34E	647123	3576135	1836
CP 00649	CP	PRO	0	MID AMERICAN PETROLEUM COMPANY	LE	CP 00649					3 4 1	10	23S	34E	644855	3576950*	1935
CP 01841	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01841 POD1	211FC			Shallow	3 3 3	03	23S	34E	644389	3577684	2171
CP 01785	CP	STK	3	LIMESTONE BASIN PROPERTIES	LE	CP 01785 POD1	20F8C			Shallow	4 1 3	14	23S	34E	646203	3575003	2897
CP 01802	CP	STK	3	LIMESTONE BASIN PROPERTIES	LE	CP 01802 POD1	22472				2 2 2	35	22S	34E	647437	3580847	3096
CP 01120	CP	STK	3	LIMESTONE BASIN PROPERTIES	LE	CP 01120 POD1	NA			Shallow	2 3 3	14	23S	34E	646366	3574753	3132
CP 01729	CP	COM	200	LIMESTONE BASIN PROPERTIES	LE	CP 01120 POD1	NA			Shallow	2 3 3	14	23S	34E	646366	3574753	3132
CP 01838	CP	COM	100	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01838 POD1	211EA			Shallow	3 3 3	07	23S	35E	649294	3576148	3243
CP 01894	CP	MON	0	TALON LPE	LE	CP 01894 POD3	NA				1 4 4	26	22S	34E	647255	3581185	3379
CP 01845	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01845 POD1	21200			Shallow	4 4 3	33	22S	34E	643396	3579337	3475
CP 01894	CP	MON	0	TALON LPE	LE	CP 01894 POD1	NA				3 2 4	26	22S	34E	647253	3581314	3504
					LE	CP 01894 POD2					3 2 4	26	22S	34E	647253	3581314	3504
CP 01760	CP	EXP	0	LIMESTONE BASIN PROPERTIES	LE	CP 01760 POD1	NA			Artesian	3 1 2	16	23S	34E	643627	3575897	3533

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

(acre ft per annum)

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q 6416	q 4	Sec	Tws	Rng	X	Y	Distance
CP 01894	CP	MON	0	TALON LPE	LE	CP 01894 POD4	NA				4 2	4	26	22S	34E	647449	3581319	3554
CP 00637	CP	PRO	3	KELLER RV, LLC	LE	CP 00637				Shallow	3 3	4	15	23S	34E	645293	3574541*	3568
CP 01073	CP	COM	85	LIMESTONE BASIN PROPERTIES	LE	CP 01073 POD1				Shallow		3	33	22S	34E	643327	3579453	3587
CP 01740	CP	COM	303	LIMESTONE BASIN PROPERTIES	LE	CP 01740 POD1	NA			Artesian	1 1	1	34	22S	34E	644401	3580765	3598
					LE	CP 01826 POD1				Artesian	1 1	1	34	22S	34E	644379	3580778	3622
CP 01826	CP	EXP	0	LIMESTONE BASIN PROPERTIES	LE	CP 01826 POD1	NA			Artesian	1 1	1	34	22S	34E	644379	3580778	3622
CP 01730	CP	EXP	0	LIMESTONE BASIN PROPERTIES	LE	CP 01730 POD1	NA			Artesian	2 2	1	16	23S	34E	643549	3575824	3638
CP 01803	CP	STK	3	LIMESTONE BASIN PROPERTIES	LE	CP 01803 POD1	22473			Shallow	1 1	1	34	22S	34E	644356	3580786	3641
CP 01622	CP	COM	100	LIMESTONE BASIN PROPERTIES	LE	CP 01622 POD1	NA			Shallow	1 3	3	04	23S	34E	642829	3577872	3722
CP 00606	CP	PRO	0	NATOMAS NORTH AMERCIA INC.	LE	CP 00606				Shallow	4	1	23	23S	34E	646613	3573854*	4026
CP 01844	CP	COM	150	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01844 POD1	211FF			Shallow	3 3	3	33	22S	34E	642763	3579308	4048
CP 01758	CP	EXP	0	LIMESTONE BASIN PROPERTIES	LE	CP 01758 POD1	NA				1 2	3	18	23S	35E	649680	3575267	4076
CP 00612	CP	PRO	0	J.C. MILLS	LE	CP 00612					4 4	1	18	23S	35E	649900	3575408*	4161
CP 00323	CP	PRO	0	SHELL OIL COMPANY	LE	CP 00323						3 2	22	23S	34E	645406	3573837*	4202
CP 01830	CP	COM	100	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01830 POD1	211F8			Shallow	3 3	3	18	23S	35E	649288	3574568	4296
CP 00618	CP	PRO	0	ESTORIL PRODUCING CO.	LE	CP 00618				Shallow	1 2	4	22	23S	34E	645713	3573539*	4421
CP 01502	CP	COM	250	WATER SPUR LLC	LE	CP 01502 POD2	NA			Shallow	4 3	3	05	23S	34E	642073	3577676	4482
CP 01706	CP	EXP	0	LIMESTONE BASIN PROP RANCH LLC	LE	CP 01706 POD1	NA			Shallow	4 4	2	32	22S	34E	642603	3580185	4572
CP 01686	CP	COM	100	LIMESTONE BASIN PROPERTIES	LE	CP 01705 POD1	20D10			Shallow	4 4	2	32	22S	34E	642587	3580179	4582
CP 01705	CP	STK	3	LIMESTONE BASIN PROPERTIES	LE	CP 01705 POD1	20D10			Shallow	4 4	2	32	22S	34E	642587	3580179	4582
CP 01829	CP	EXP	0	LIMESTONE BASIN PROPERTIES	LE	CP 01829 POD1	NA			Artesian	4 4	2	32	22S	34E	642559	3580172	4604
CP 01624	CP	EXP	0	ATKINS ENGR ASSOC INC	LE	CP 01624 POD1					4 2	2	32	22S	34E	642669	3580494	4680

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

(acre ft per annum)

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code Grant	Source	q 6416	q 4	q	Sec	Tws	Rng	X	Y	Distance
CP 01686	CP	COM	100	LIMESTONE BASIN PROPERTIES	LE	CP 01686 POD1	NA			4	2	2	32	22S	34E	642669	3580494	4680
CP 01258	CP	MON	0	STRAUB CORPORATION	LE	CP 01258 POD1				1	4	3	22	23S	34E	645014	3573221	4905
CP 00580	CP	PRO	0	NATOMAS NORTH AMERICA INC	LE	CP 00580			Shallow	3	4	3	23	23S	34E	646524	3572948*	4932
CP 01977	CP	MON	0	MATADOR PRODUCTION COMPANY	LE	CP 01977 POD1	NA			3	3	3	23	23S	34E	646093	3572949	4951

Record Count: 44

UTMNAD83 Radius Search (in meters):

Easting (X): 646551.96 **Northing (Y):** 3577880.29 **Radius:** 5000

Sorted by: Distance

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

State Wetland 10,396ft.

May 30, 2024

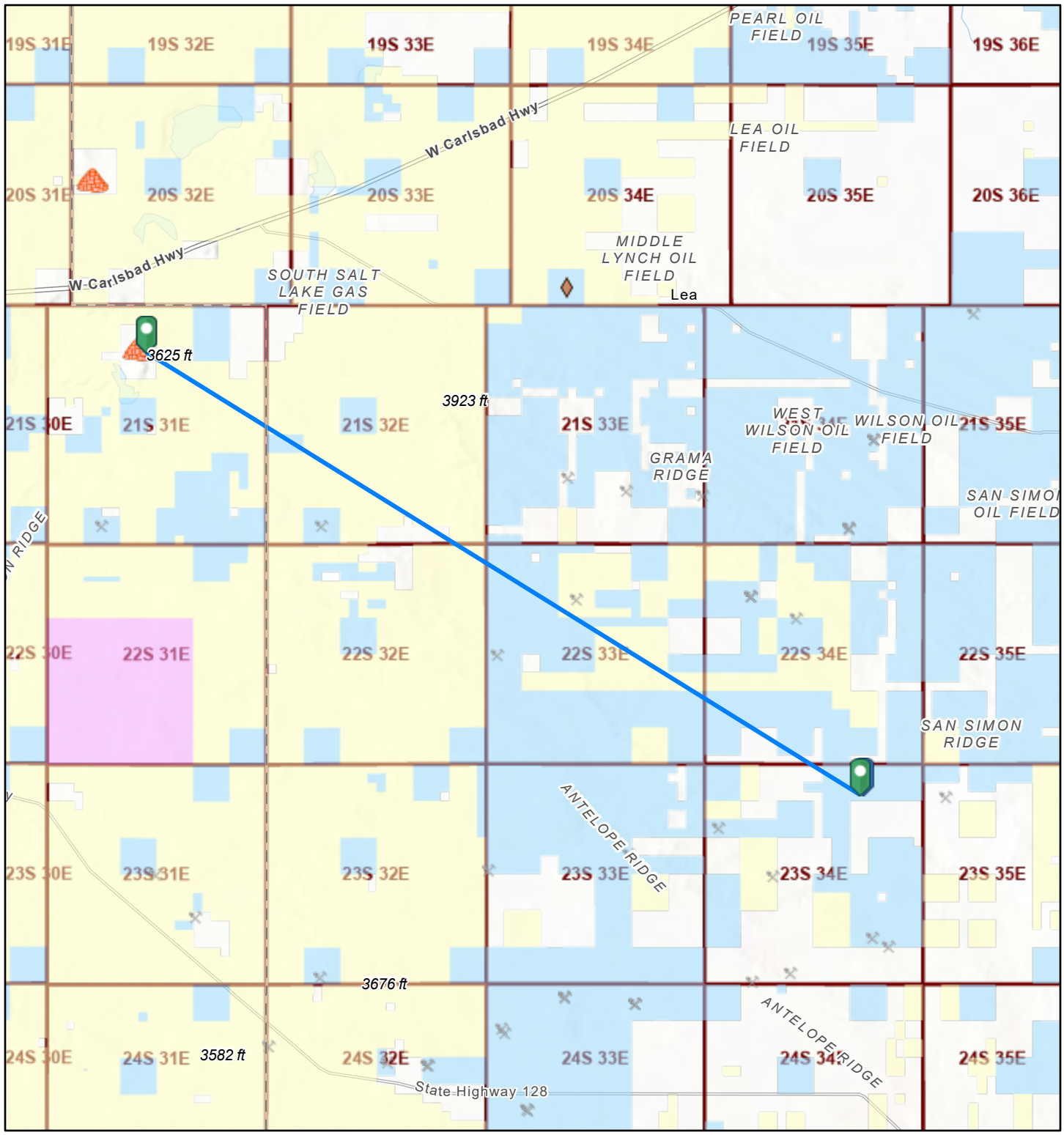
Wetlands

- 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

Active Mines in New Mexico



5/30/2024, 12:59:23 PM

1:288,895

0 2 4 8 mi

0 3.25 6.5 13 km

Registered Mines

- Aggregate, Stone etc.
- Aggregate, Stone etc.
- Aggregate, Stone etc.
- Industrial Minerals (Other)
- Potash

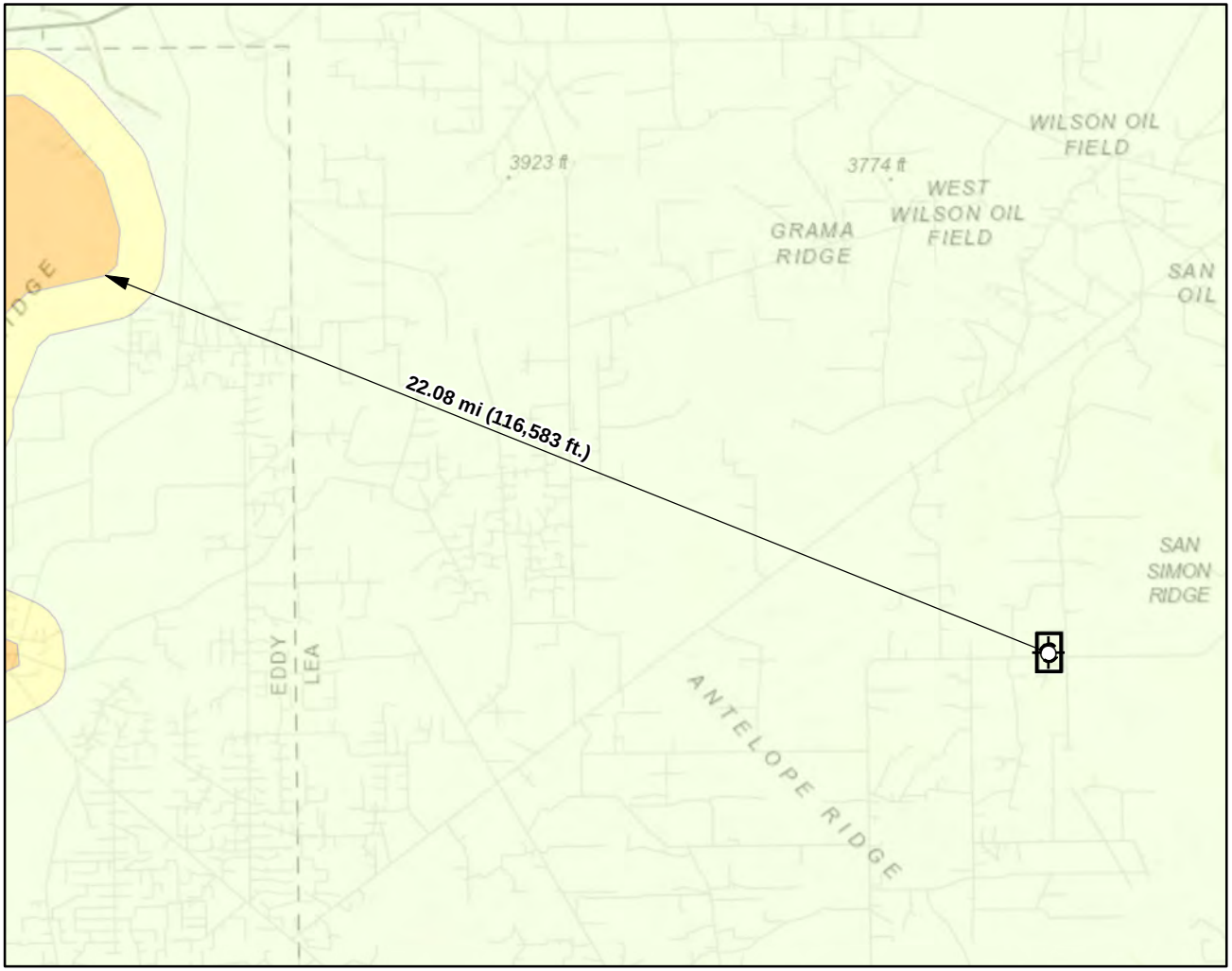
Land Ownership

- BLM
- DOE
- P
- S
- PLSS Townships

Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS, U.S. BLM, Esri, NASA, NGA, USGS, BLM

EMNRD MMD GIS Coordinator

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



Karst Potential

- Critical
- High
- Medium
- Low

Site Location

Site Buffer (~1,000 ft.)

Overview Map

0 2 4 mi

Detail Map

0 300 600 ft

VERTEX

Map Center:
Lat/Long: 32.382876, -103.603094

NAD 1983 UTM Zone 13N
Date: May 31/24

N

Karst Potential Map
State 2 8016 JV-P #001

FIGURE:
X

BTA

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.

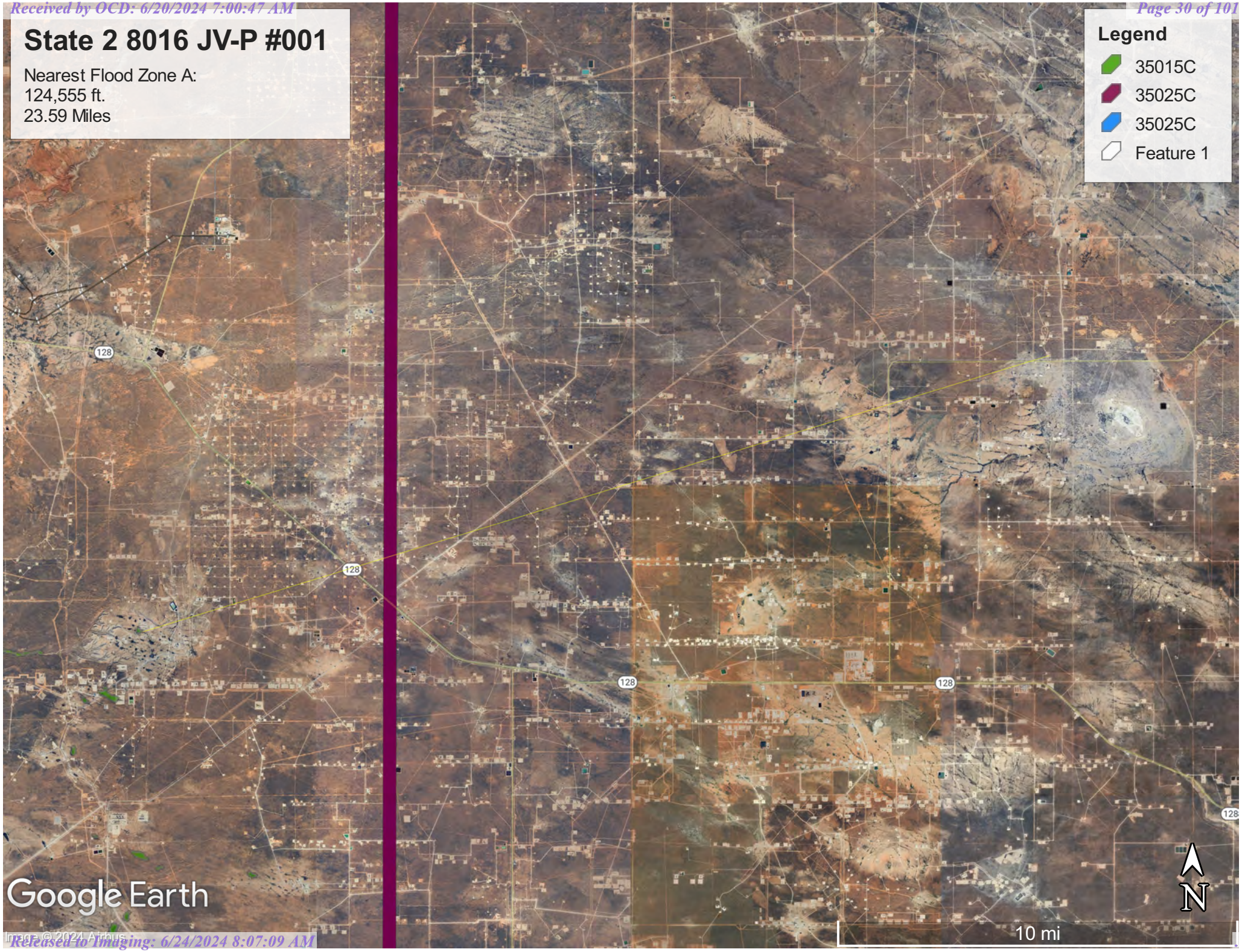
Note: Inset Map, Esri 2023; Overview Map: Esri World Topographic. Karst potential data sourced from Roswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management. (2018). Karst Potential.

VERSATILITY. EXPERTISE.

Document Path: S:\04 - Geomatics\1-Projects_US PROJECTS\BTA Oil Producers LLC\2024\24E-02760 - State 2 8016 JV-P #001\Project\Figure 1 Karst Potential Map (24E-02760).mxd

State 2 8016 JV-P #001

Nearest Flood Zone A:
124,555 ft.
23.59 Miles



National Flood Hazard Layer FIRMette

FEMA

103°26'53"W 32°19'57"N

103°26'16"W 32°19'26"N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/30/2024 at 3:02 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.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Lea County, New Mexico

May 30, 2024

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 20, Sep 6, 2023

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

Date(s) aerial images were photographed: Feb 7, 2020—May 12, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MN	Ratliff-Wink fine sandy loams	5.7	81.4%
PU	Pyote and Maljamar fine sands	1.3	18.6%
Totals for Area of Interest		**7.0**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

Lea County, New Mexico

MN—Ratliff-Wink fine sandy loams

Map Unit Setting

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

Map Unit Composition

Ratliff and similar soils: 45 percent
Wink and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ratliff

Setting

Landform: Plains
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous alluvium and/or calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 4 inches: fine sandy loam
Bw - 4 to 22 inches: clay loam
Bk - 22 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 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: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: B
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Description of Wink

Setting

Landform: Plains
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous sandy alluvium and/or calcareous sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 12 inches: fine sandy loam
Bk - 12 to 23 inches: sandy loam
BCk - 23 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 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: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 6 percent
Ecological site: R070BC022NM - Sandhills
Hydric soil rating: No

Maljamar

Percent of map unit: 5 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Palomas

Percent of map unit: 4 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

PU—Pyote and Maljamar fine sands

Map Unit Setting

National map unit symbol: dmqq
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Pyote and similar soils: 46 percent
Maljamar and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pyote

Setting

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

Typical profile

A - 0 to 30 inches: fine sand
Bt - 30 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 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: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Maljamar

Setting

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

Typical profile

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

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 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: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 10 percent
Ecological site: R070BC022NM - Sandhills
Hydric soil rating: No

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USDA Natural Resources Conservation Service

Ecological site R070BC007NM
Loamy

Accessed: 05/30/2024

General information

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

Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on uplands landforms, mainly on hill slopes, ridges, plains, terraces and some fan remnants. Slopes range from 1 to 5 percent and average about 3 percent. Average annual precipitation is about 8 to 14 inches. Elevations range from 2,842 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Terrace (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–5,000 ft
Slope	0–5%
Aspect	E, S, W

Climatic features

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

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

The average frost-free season is 207 to 220 days. The last killing frost is in late March or early April, and the first killing frost is in late October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest in January through June rapidly drying out the soil during a critical time for cool season plant growth.

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

Table 3. Representative climatic features

Frost-free period (average)	221 days
Freeze-free period (average)	240 days
Precipitation total (average)	13 in

Influencing water features

This site is not influenced by wetland or streams.

Soil features

The soils of this site are deep to moderately deep. The moderately deep soils have either a petrocalcic, petrogypsic or gypsum horizon between 30 and 40 inches.

Surface textures are loam, silt loam, very fine sandy loam, or clay loam. Substratum textures are loam, silty clay loam, clay loam, or silt loams. Subsoil textures are silt loam , clay loam silty clay loam, gravelly loam, gravelly clay loam or very gravelly loam. Permeability is moderate to slow and the available water holding capacity is high to moderate. The Atoka, Reeves, Russler, Milner soils may have highr amounts of CaC03, ranging as high as 40 percent in the subsoil. Rock fragments range fro 5 to 50 percent in the subsoil. Reeves, Rusler, Milner, Holloman soils will have 40 to 80 percent gypsum in the underlying material.

Maximum and minimum values listed below represent the characteristic soils for this site.

Characteristic Soils:

Atoka (petrocalcic)
Bigetty
Reagan
Reakor
Reeves (gypsum)
Russler (gypsum)
Largo
Russler (gypsum)
Largo
Berino
Tinney
Midessa
Ratliff
Holloman (gypsum)
Milner (gypsum)

Table 4. Representative soil features

Surface texture	(1) Loam (2) Very fine sandy loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to slow
Soil depth	30–72 in

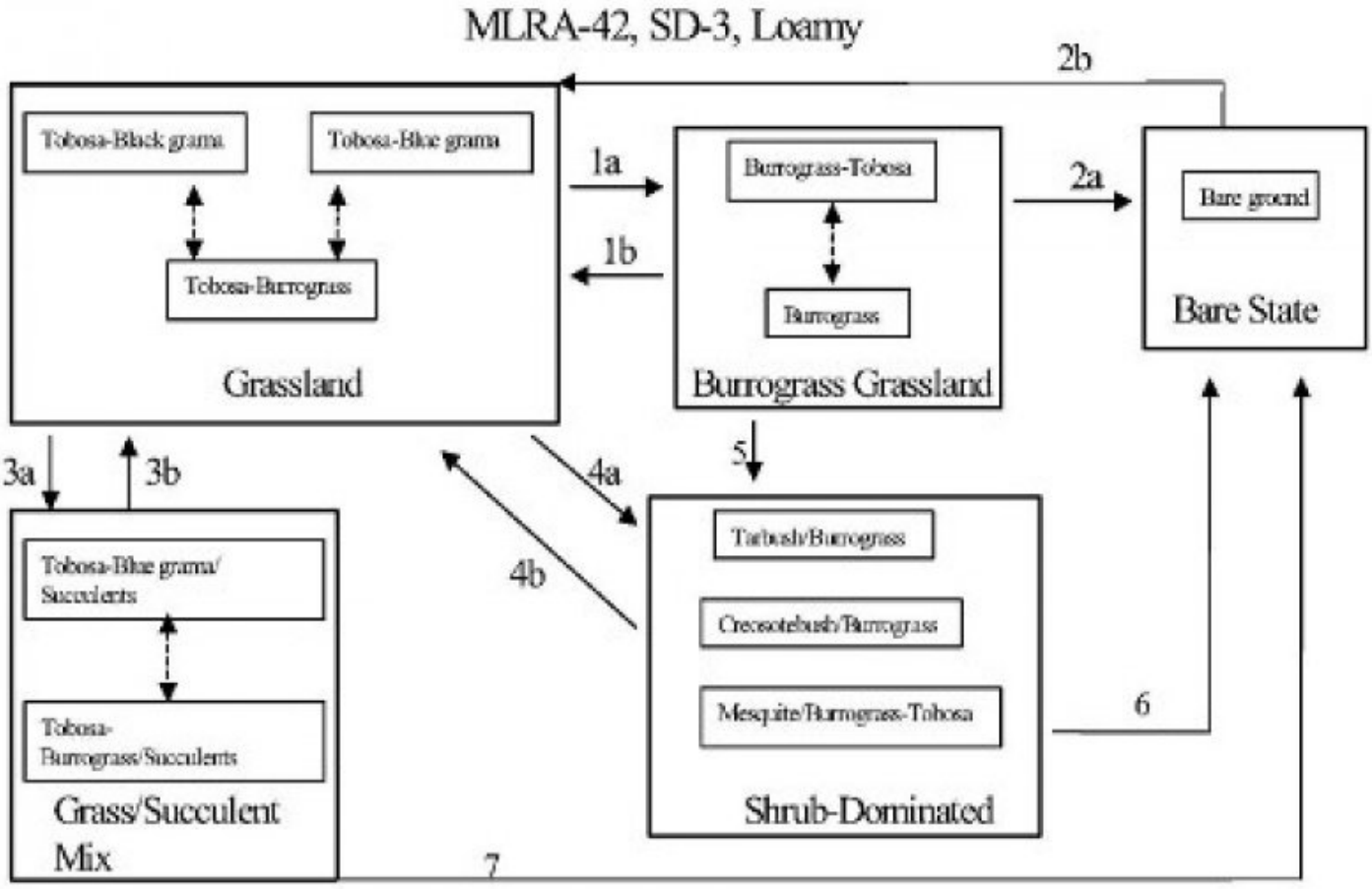
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–12 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–6
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Overview: The Loamy site is associated with the Gyp Upland ecological site with which it intergrades. There is a pronounced increase in alkali sacaton along this interface. The loamy site is also associated with the Gravelly and Shallow ecological sites from which it receives run-on water. The Draw site often dissects Loamy sites and is distinguished from the Loamy site by increased production or greater densities of woody species. The historic plant community has a grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Tobosa, black grama and blue grama are the dominant species. Retrogression within this state is characterized by a decrease in black and blue grama and an increase in burrograss. Continuous overgrazing and drought can initiate a transition to a Burrograss- Grassland state. Continued reduction in grass cover and resulting infiltration problems may eventually effect a change to a Bare State, with very little or no remaining grass cover. Alternatively, creosotebush, tarbush or mesquite may expand or invade. Transitions back to a Grassland State from a Bare or Shrub-Dominated state are costly and may not be economically feasible. Decreased fire frequency may play a part in the transition to the Grass/Succulent Mix state with increased amounts of cholla and prickly pear.

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Soil drying, overgrazing, drought, soil surface sealing. 1b. Restore natural overland flow, increase infiltration, prescribed grazing.

2a. Severe reduction in cover, soil surface sealing, decreased infiltration, erosion. 2b. Restore hydrology, break up physical crust, range seeding, prescribed grazing.

3a. Lack of fire, overgrazing, hail storms or other physical disturbance, drought. 3b. Prescribed fire, brush control, prescribed grazing.

4a. Seed dispersal of shrubs, persistent loss of grass cover, competition by shrubs, lack of fire. 4b. Brush control, range seeding -dependent on amount of grass (seed bank) remaining.

5. Loss of grass cover, seed dispersal of shrubs, competition by shrubs.

6. & 7. Brush control with continued loss of grass cover, soil sealing, erosion.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing Historic Climax Plant Community Grassland: The historic plant community has a grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Black grama, blue grama, and tobosa are the dominant grass species. There are a variety of perennial forbs and their production varies widely by season and year. Globemallow, verbena, groundsels, croton and filaree are forbs commonly found on this site. Fourwing saltbush and winterfat are two of the more palatable shrubs. The Loamy ecological site encompasses a

wide variety of soils, with surface textures ranging from sandy loams to clay loams. Soil depths range from shallow to very deep and can include sub surface features such as calcic, petrocalcic, and gypsic horizons. These variations cause differences in plant community composition and dynamics. Black grama is found at highest densities on coarser textured sandy loams, with blue grama preferring finer textured loam and silt loam, and tobosa favoring lower landscape positions and loam to clay loam surface textures. Burrograss may often be the dominant grass species on silty soils, perhaps in part due to the seedlings ability to auger into and establish on physically crusted soils. Gypsum influenced soils typically have greater amounts of tobosa, burrograss, and ephedra. There is greater representation of sideoats and vine mesquite within the tobosa-blue grama community. Retrogression under continuous heavy grazing results in a decrease of black grama, blue grama, sideoats grama, plains bristlegrass, bush muhly, cane bluestem, vine mesquite, winterfat, and fourwing saltbush. Species such as burrograss, threeawns, sand dropseed, sand muhly, and broom snakeweed increase under continuous heavy grazing or prolonged periods of drought. Under continued retrogression burrograss can completely dominate the site. Creosotebush, tarbush, and mesquite, can also dominate. Cholla and prickly pear can increase on areas that are disturbed or overgrazed. Diagnosis: Tobosa, black grama, and blue grama are the dominant species. Grass cover is uniformly distributed with few large bare areas. Shrubs are sparse and evenly distributed. Slopes range from level to gently sloping and usually display limited evidence of active rills and gully formation if plant cover remains intact. Litter movement associated with overland flow is limited to smaller size class litter and short distances. Other shrubs include: yucca, mesquite, tarbush, cholla and creosote bush. Other forbs include: desert holly, scorpionweed, bladderpod, flax, nama, fleabane, Indianwheat, Indian blanket flower, groundcherry, deerstongue, and rayless goldenrod.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	585	833	1080
Forb	39	55	72
Shrub/Vine	26	37	48
Total	**650**	**925**	**1200**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	15-30%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	25-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-50%

Figure 5. Plant community growth curve (percent production by month). NM2807, R042XC007NM Loamy HCPC. R042XC007NM Loamy HCPC Warm Season Plant Community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	10	25	30	15	5	0	0

State 2

Burrograss-Grassland

Community 2.1
Burrograss-Grassland

Burrograss-Grassland: Changes in hydrology resulting in decreased available soil moisture, reduces grass cover and increases bare ground. Burrograss is the dominant grass. Tobosa cover is variable and can range from sizeable areas to small patches occupying only depressions or the lowest and wettest positions within the site. Threeawns, ear muhly, sand muhly, and fluffgrass occur at increased densities compared to the grassland state. Shrub densities may increase especially mesquite, creosotebush or tarbush. Retrogression within this state is characterized by a further decrease in grass cover and increased bare ground. Further deterioration of this site can result in the transition to a bare state or becoming shrub dominated. Diagnosis: Burrograss is the dominant species. Grass cover is no longer uniformly distributed, instead tending to be patchy with large areas of bare ground present. Physical crusts are present in bare areas reducing infiltration and suppressing seedling establishment by any grass species other than burrograss. Transition to Burrograss-Grassland (1a): Transitions from grassland to a burrograss-grassland state may occur due to changes in hydrology. Gullies, roads or obstructions that alter natural water flow patterns may cause this transition. Changes in surface hydrology may also occur due to overgrazing or drought. The reduction in grass cover promotes increased soil physical crusts and reduces infiltration. 5 Key indicators of approach to transition: ? Diversion of overland flow resulting in decreased soil moisture. ? Increase in amount of burrograss cover ? Reduction in grass cover and increase in size and frequency of bare patches. ? Formation of physical crusts—indicating reduced infiltration. ? Evidence of litter movement—indicating loss or redistribution of organic matter. Transition back to Grassland (1b) The natural hydrology of the site must be returned. Culverts, turnouts, or rerouting roads may help re-establish natural overland flow, if roads or trails have altered the hydrology. Erosion control structures or shaping and filling gullies may help regain natural flow patterns and establish vegetation if the flow has been channeled. Breaking up physical crusts by soil disturbance may promote infiltration and seedling emergence. Allow natural revegetation to take place. Prescribed grazing will help ensure proper forage utilization and reduce grass loss due to grazing.

State 3
Bare State

Community 3.1
Bare State

Bare State: Extremely low ground cover, soil degradation and erosion characterize this state. Very little vegetation remains. Burrograss is the dominant grass and cover is extremely patchy. Physical soil crusts are extensive. Erosion and resource depletion increase as site degrades. Diagnosis: Very little cover remains. Erosion is evident by soil sealing, water flow patterns, pedestals or terracettes. Rills and gullies may be present and active. Transition to Bare State (2a): Extended drought, continuous heavy grazing, or other disturbance that severely depletes grass cover can effect this transition. As grass cover decreases, sheet flow and erosion increase, and physical soil crusts form, thereby further reducing infiltration. Key indicators of approach to transition: ? Continued reduction in grass cover. ? Increased soil surface sealing. ? Increased erosion. ? Reduced aggregate stability in bare areas. Transition back to Grassland (2b) Restore the hydrology, see (1a). With the extent of grass loss range seeding may be necessary. Utilizing livestock or mechanical means to break up the physical crusts may increase infiltration and aid seedling establishment. Prescribed grazing will help ensure adequate deferment period following seeding, and proper forage utilization once the grass stand is well established. The degree to which this site is capable of recovery depends on the restoration of hydrology, extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

State 4
Grass/Succulent Mix

Community 4.1
Grass/Succulent Mix

Grass / Succulent Mix: Increased representations of succulents characterize this site. Increased densities of cholla or pricklypear is recognized as a management concern, but their impact on grass production is unclear. Light to

medium cholla or prickly pear infestation doesn't seem to greatly reduce grass production, however it limits access to palatable grasses and interferes with livestock movement and handling. Tobosa and blue grama are the dominant species on this site. Retrogression within this site is characterized by a decrease in blue grama and an increase in succulents, tobosa and burrograss. Diagnosis: Cholla or prickly pear is found at increased densities. Grass cover is variable ranging from uniformly distributed to patchy with frequent areas of bare ground present. Tobosa or blue grama is the dominant grass species. Transition to Grass/Succulent Mix (3a): If fire was historically a part of desert grassland ecosystem and played a role in suppressing seedlings of shrubs and succulents, then fire suppression may favor the increase of succulents.1 Heavy grazing by livestock or other physical disturbances may help disseminate seed and increase the establishment of succulents. Areas historically overgrazed by sheep are sometimes associated with higher densities of Succulents. Intense hailstorms can spread pricklypear by breaking off joints causing new plants to take root.3 During severe drought perennial grass cover can decline significantly, leaving resources available for use by more drought tolerant succulents. Cholla and pricklypear are both adapted to and favored by drought due to the ability of their shallow, wide spreading root systems to absorb and store water.4 Key indicators of approach to transition: ? Decrease or change in distribution of grass cover. ? Increase in amount of succulent seedlings. ? Increased cover of succulents. Transition back to Grassland (3b) Fire is an effective means of controlling cholla and prickly pear if adequate grass cover remains to carry fire.2 Cholla greater than two feet tall or pricklypear with a large amount of pads (>15-20) are harder to kill. Chemical control is effective in controlling prickly pear and cholla; apply when growth starts in May. Hand grubbing is also effective if cholla or pricklypear is severed 2-4 inches below ground and care is taken not to let broken joints or pads take root. Stacking and burning piles and grubbing during winter or drought help keeps broken joints and pads from rooting. Prescribed grazing will help ensure proper forage utilization and sustain grass cover.

State 5
Shrub Dominated

Community 5.1
Shrub Dominated

Shrub Dominated: Increased shrub cover characterizes this state. Mesquite, creosotebush, and/or tarbush are the dominant shrub species. Burrograss or tobosa is the dominant grass species. Grass cover is decreased, typically patchy with large bare areas present; however, sometimes grass cover can remain relatively high for extended periods when associated with light to moderate infestations of mesquite. Variations in soil characteristics play a part in determining which shrub species increase. Mesquite is well adapted to a wide range of soil types, but increases more often on deep soils low in carbonates, that have a sandy surface overlying finer textured soils. Tarbush prefers finer textured, calcareous soils, usually in lower positions that receive some extra water. Creosotebush is less tolerant of fine textured soils, preferring sandy, calcareous soils that have some gravel. Creosotebush also does well on soils that are shallow over caliche. Retrogression within this state is characterized by a decrease in tobosa, and an increase in burrograss. As the site continues to degrade shrub cover continues to increase and grass cover is severely reduced. Diagnosis: Mesquite, Creosotebush, and/or tarbush are the dominant shrubs. Blue grama and black grama cover is low or absent. Burrograss or tobosa are the dominant grasses. Typically grass cover is patchy with large interconnected bare areas present. Physical soil crusts are present, especially on silt loam surface soils. Transition to Shrub Dominated (4a): Wildlife and livestock consume and disperse mesquite seeds. Flood events may wash creosote or tarbush seeds off adjacent gravelly sites onto the loamy site and supply adequate moisture for germination. Persistent loss of grass cover due to overgrazing or drought can cause large bare patches, providing competition free areas for shrub seedling establishment. As shrub cover increases, competition for soil resources, especially water, becomes a major factor in further reducing grass cover. Reduction of fire, due to either fire suppression policy or loss of adequate fine fuels may increase the probability of shrub encroachment. Increased soil surface physical crusts and associated decreased infiltration, may prevent the establishment of grass seedlings. Transition to Shrub Dominated (5): The dispersal of creosotebush, tarbush or mesquite seed, combined with loss of grass cover and resource competition by shrubs may cause this transition. Key indicators of approach to transition: ? Decreased grass and litter cover. ? Increased bare patch size. ? Increased physical soil crusts. ? Increased amount of mesquite, creosotebush, or tarbush seedlings. ? Increased shrub cover. Transition back to Grassland (4b) Brush control will be necessary to remove shrubs and eliminate competition for resources necessary for grass establishment or reproduction. Seeding may be necessary on those sites where desired grass species are absent or very limited. Pitting and seeding may increase the chances of successful grass establishment. Prescribed grazing will help ensure adequate time is elapsed before grazing seeded area is allowed and proper forage utilization following seeding establishment. Transition to Bare State (6): If grass cover on the shrub-dominated state is

severely limited and shrubs are removed a bare state may result. This transition will depend on amount of grasses or seed remaining, whether site is seeded, or if seeding is successful. Transition to Bare State (7): Removal of succulents and continued overgrazing or drought may cause loss of remaining grasses and erosion. Soil surface physical crusting may also be an important factor in inhibiting grass seedling establishment

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			278–324	
	tobosagrass	PLMU3	*Pleuraphis mutica*	278–324	–
2	**Warm Season**			9–46	
	burrograss	SCBR2	*Scleropogon brevifolius*	9–46	–
3	**Warm Season**			231–278	
	black grama	BOER4	*Bouteloua eriopoda*	231–278	–
	blue grama	BOGR2	*Bouteloua gracilis*	231–278	–
4	**Warm Season**			28–46	
	sideoats grama	BOCU	*Bouteloua curtipendula*	28–46	–
5	**Warm Season**			46–93	
	bush muhly	MUPO2	*Muhlenbergia porteri*	46–93	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	46–93	–
6	**Warm Season**			9–28	
	Arizona cottontop	DICA8	*Digitaria californica*	9–28	–
7	**Warm Season**			46–93	
	threeawn	ARIST	*Aristida*	46–93	–
	muhly	MUHLE	*Muhlenbergia*	46–93	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	46–93	–
8	**Warm Season**			28–46	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	28–46	–
Shrub/Vine					
9	**Shrub**			9–28	
	fourwing saltbush	ATCA2	*Atriplex canescens*	9–28	–
	jointfir	EPHED	*Ephedra*	9–28	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	9–28	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	5–24	–
	Arizona cottontop	DICA8	*Digitaria californica*	5–24	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	5–24	–
10	**Shrub**			9–28	
	javelina bush	COER5	*Condalia ericoides*	9–28	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	9–28	–
	Grass, annual	2GA	*Grass, annual*	5–15	–
11	**Shrubs**			9–28	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	9–28	–
Forb					

12	**Forb**			9–46	
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	9–46	–
	globemallow	SPHAE	*Sphaeralcea*	9–46	–
	verbena	VEPO4	*Verbena polystachya*	9–46	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	5–15	–
	pricklypear	OPUNT	*Opuntia*	5–15	–
13	**Forb**			9–28	
	croton	CROTO	*Croton*	9–28	–
	woolly groundsel	PACA15	*Packera cana*	9–28	–
14	**Forb**			9–28	
	Goodding's tansyaster	MAPIG2	*Machaeranthera pinnatifida ssp. gooddingii var. gooddingii*	9–28	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	9–28	–
15	**Forb**			9–28	
	redstem stork's bill	ERCI6	*Erodium cicutarium*	9–28	–
	Texas stork's bill	ERTE13	*Erodium texanum*	9–28	–
16	**Forb**			9–28	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	9–28	–

Animal community

This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, black tailed prairie dog, yellow-faced pocket gopher, banner-tailed kangaroo rat, hispid cotton rat, swift fox, burrowing owl, horned lark, mockingbird, meadowlark, mourning dove, scaled quail, Great Plains toad, plains spadefoot toad, prairie rattlesnake and western coachwhip shake.

Hydrological functions

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

Hydrologic Interpretations
Soil Series Hydrologic Group
Atoka C
Bigetty B
Ratliff B
Reyab B
Holloman B
Largo B
Holloman B
Bigetty B
Berino B
Reagan B
Reakor B
Reeves B
Russler C

Recreational uses

This site offers limited potential for hiking, horseback riding, nature observation and photography. Game bird, antelope and predator hunting are also limited.

Wood products

This site has no potential for wood products

Other products

This site is suitable for grazing by all kinds and classes of livestock, during all seasons of the year. Under retrogression, such plants as black grama, blue grama, sideoats grama, bush muhly, plains bristlegrass, Arizona cottontop, fourwing saltbush and winterfat decrease and there is an increase in burrograss, threeawns, sand dropseed, muhlys, broom snakeweed and javilinabush. Under continued retrogression, burrograss can completely dominate the site. Creosotebush, mesquite, and tarbush can also dominate. Grazing management alone will not improve the site in the above situation. This site is well suited to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 3.0 – 4.2
75 – 51 4.1 – 5.5
50 – 26 5.3 – 7.0
25 – 0 7.1 +

Inventory data references

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

Other references

Literature References:

1. Brooks, M.L., AND D.A. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pages 1–14 in K.E.M. Galley and T.P. Wilson (eds.). Proceedings of the Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species.

2. Bunting, S.C., H.A. Wright, and L.F. Neuenschwander. 1980. Long-term effects of fire on cactus in the Southern Mixed Prairie of Texas. J. Range. Manage. 33: 85-88.

3. Laycock, W.A. 1982. Hail as an ecological factor in the increase of prickly
pear cactus. p. 359-361. In: J.A. Smith and V.W. Hays (eds.) Proc. XIV Int. Grassland Congr. Westview Press, Boulder, Colo.

4. Vallentine, J.F. 1989. Range Developments and Improvements. 3rd Edition. Academic Press. San Diego, California.

5. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 6, [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

Contributors

David Trujillo
Don Sylvester

Rangeland health reference sheet

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

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

Indicators

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

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

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

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

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

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

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

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

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

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial**

distribution on infiltration and runoff:

---

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

---

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

---

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

---

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

---

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

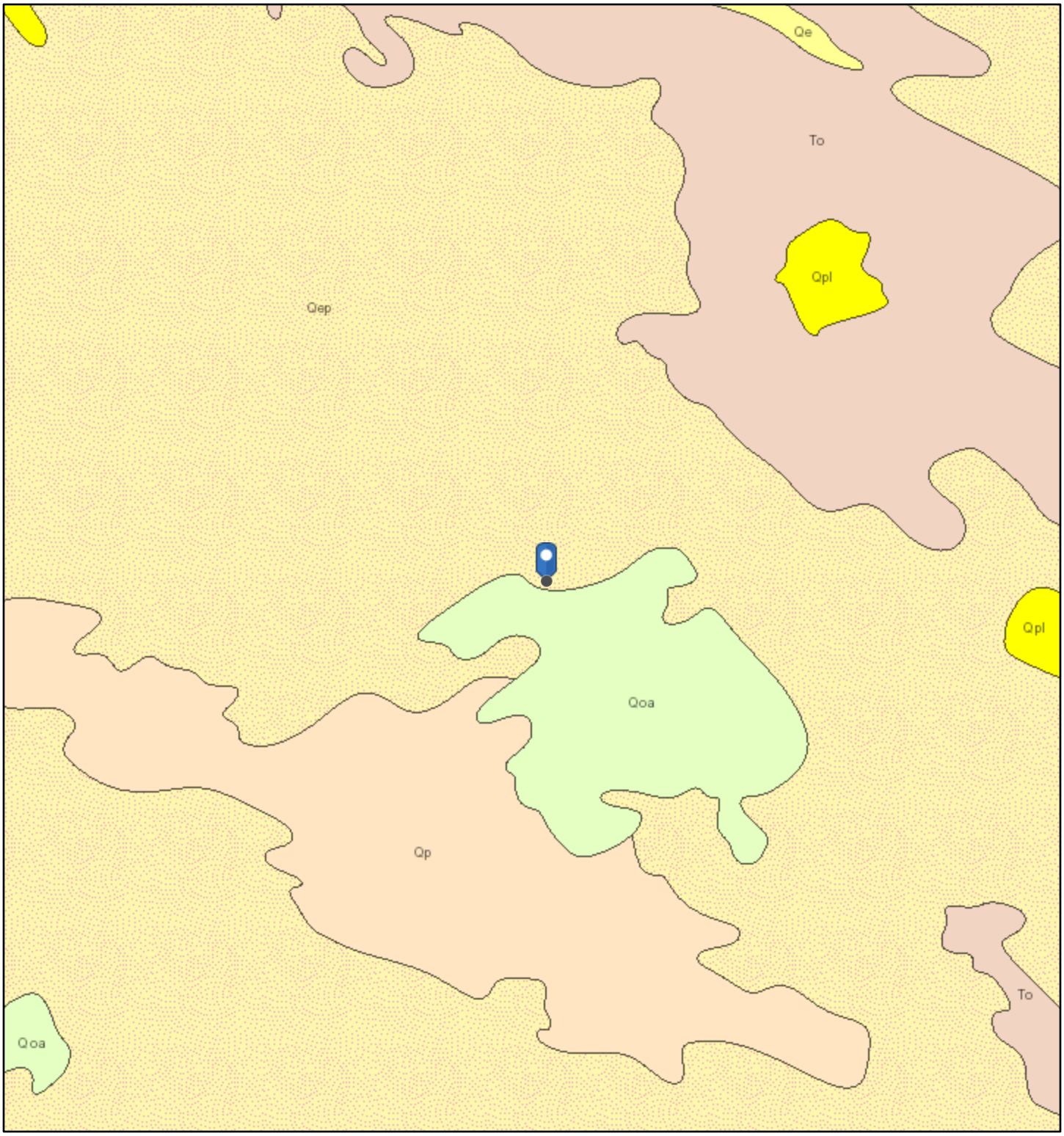
---

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

---

17. **Perennial plant reproductive capability:**

ArcGIS Web Map



5/30/2024, 1:21:27 PM

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

Lithologic Units

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

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

ArcGIS Web AppBuilder

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

APPENDIX B – Daily Field Report

Daily Site Visit Report

Client:	BTA Oil Producers LLC	Inspection Date:	5/27/2024
Site Location Name:	State 2 8016 JV-P #001	Report Run Date:	5/27/2024 11:12 PM
Client Contact Name:	Kelton Baird	API #:	30-025-27486
Client Contact Phone #:	432-312-2203		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	5/27/2024 1:30 PM
Departed Site	5/27/2024 2:30 PM

Daily Site Visit Report

Site Sketch

Site Sketch

Daily Site Visit Report

Field Notes

14:23 Completed safety paperwork on site

14:23 On site to establish 4 corners for 811 call

14:27 Southeast corner:
32.327682, -103.442214
Northeast corner:
32.328579, -103.442131
Northwest corner:
32.328614, -103.443160
Southwest corner:
32.327700, -103.443024

Next Steps & Recommendations

1 Submit 811 ticket

Daily Site Visit Report

Site Photos

Viewing Direction: Northwest	**Viewing Direction**: Southwest
	
Southeast corner	Northeast corner
Viewing Direction: Southeast	**Viewing Direction**: Northeast
	
Northwest corner	Southwest corner

Daily Site Visit Report

Viewing Direction: West	**Viewing Direction**: West
	
Vegetation at site has returned	Slightly barren area towards north edge of site

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Austin Harris

Signature: 
Signature

Daily Site Visit Report

Client	BTA Oil Producers LLC	Inspection Date	5/31/2024
Site Location Name	State 2 8016 JV-P #001	API #	30-025-27486
Client Contact Name	Kelton Baird	Project Owner	
Client Contact Phone #	432-312-2203	Project Manager	
Project Reference #			
Unique Project ID			

Summary of Times

Arrived at Site	5/31/2024 7:45 AM
Departed Site	

Field Notes

9:04 On site, marked delineation areas, began delineating all sample points will be collected at 0,1,2,3,4 ft bgs

11:31 All samples reached depth of 4ft bgs and boreholes were filled after photos

15:26 All samples were field screened and were jarred on site.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West

BH24-02

Viewing Direction: West

BH24-01

Viewing Direction: West

BH24-03

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Wyatt Wadleigh

Signature:

APPENDIX C – Notification

OCD Permitting

[NOTIFY] Notification Of Sampling (C-141N) Application

Submission Information

Submission ID:	349052	**Districts:**	Hobbs
Operator:	[260297] BTA OIL PRODUCERS, LLC	**Counties:**	Lea
Description:	BTA OIL PRODUCERS, LLC [260297] , nOY1711437340		
Status:	APPROVED		
Status Date:	05/29/2024		
References (2):	30-025-27486, nOY1711437340		

Forms

This application type does not have attachments.

Questions

Prerequisites

Incident ID (n#)	**nOY1711437340**
Incident Name	**NOY1711437340 2017 MAJOR A SWS @ 30-025-27486**
Incident Type	**Produced Water Release**
Incident Status	**Closure Not Approved**
Incident Well	**[30-025-27486] STATE 2 8016 JV-P #001**

Location of Release Source

Site Name	*Unavailable.*
Date Release Discovered	**04/24/2017**
Surface Owner	**State**

Sampling Event General Information

Please answer all the questions in this group.

What is the sampling surface area in square feet	5,000
What is the estimated number of samples that will be gathered	15
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	05/31/2024
Time sampling will commence	08:00 AM
Warning: Notification can not be less than two business days prior to conducting final sampling.	
Please provide any information necessary for observers to contact samplers	Vertex will be on site to collect confirmation samples. If you have any questions, please call 575-988-1472.
Please provide any information necessary for navigation to sampling site	32.3282013, -103.4429626

Comments

No comments found for this submission.

Conditions

Summary: *btavertex (5/29/2024),* Failure to notify the OCD of sampling events including any changes in date/time per the requirements of 19.15.29.12.D.(1).(a) NMAC, may result in the remediation closure samples not being accepted.

Reasons

No reasons found for this submission.

Go Back

APPENDIX D – Laboratory Data Report and Chain of Custody Form

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

June 11, 2024

CHANCE DIXON

VERTEX RESOURCE GROUP

420 SOUTH MAIN, SUITE 202

TULSA, OK 74103

RE: STATE 2 8016 JV - P #001

Enclosed are the results of analyses for samples received by the laboratory on 06/04/24 14:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-23-16. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 01 0' (H243138-01)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *96.9 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *101 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 01 1' (H243138-02)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *76.6 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *80.1 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 01 2' (H243138-03)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *86.2 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *91.7 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 01 3' (H243138-04)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**368**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *74.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *78.8 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 01 4' (H243138-05)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**304**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *71.7 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *75.6 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 02 0' (H243138-06)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	212	106	200	3.03	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	202	101	200	4.22	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *94.1 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *99.2 %* *49.1-148*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 02 1' (H243138-07)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *74.9 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *78.9 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 02 2' (H243138-08)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *88.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *93.2 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 02 3' (H243138-09)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	06/07/2024	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *99.7 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *108 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 02 4' (H243138-10)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *109 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *118 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 03 0' (H243138-11)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *99.1 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *108 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 03 1' (H243138-12)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *104 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *113 %* *49.1-148*

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CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 03 2' (H243138-13)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *107 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *117 %* *49.1-148*

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PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 03 3' (H243138-14)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *102 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *111 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE GROUP
CHANCE DIXON
420 SOUTH MAIN, SUITE 202
TULSA OK, 74103
Fax To: NA

Received:	06/04/2024	Sampling Date:	05/31/2024
Reported:	06/11/2024	Sampling Type:	Soil
Project Name:	STATE 2 8016 JV - P #001	Sampling Condition:	Cool & Intact
Project Number:	24E - 02760	Sample Received By:	Tamara Oldaker
Project Location:	BTA - LEA CO NM		

Sample ID: BH24 - 03 4' (H243138-15)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	06/06/2024	ND	1.96	97.9	2.00	3.53	
Toluene*	<0.050	0.050	06/06/2024	ND	2.11	105	2.00	1.71	
Ethylbenzene*	<0.050	0.050	06/06/2024	ND	2.11	106	2.00	0.513	
Total Xylenes*	<0.150	0.150	06/06/2024	ND	6.48	108	6.00	0.297	
Total BTEX	<0.300	0.300	06/06/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	06/07/2024	ND	448	112	400	7.41	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	06/05/2024	ND	203	101	200	1.34	
DRO >C10-C28*	<10.0	10.0	06/05/2024	ND	203	101	200	0.369	
EXT DRO >C28-C36	<10.0	10.0	06/05/2024	ND					

Surrogate: 1-Chlorooctane *110 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *120 %* *49.1-148*

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Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

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CARDINAL Laboratories

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Vertex (BTA)	**BILL TO**	
Project Manager:	Chance Dixon	P.O. #:	BTA on file
Address:	on file	Company:	BTA
City:	State: Zip:	Attn:	on file
Phone #:	Fax #:	Address:	
Project #:	24E-02760 Project Owner:	City:	
Project Name:	State 2 8016 JV-P #001	State:	Zip:
Project Location:	State 2 8016 JV-P #001	Phone #:	
Sampler Name:	Wyatt Wadleigh	Fax #:	

FOR LAB USE ONLY				MATRIX							PRESERV.			SAMPLING		ANALYSIS REQUEST		
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	TPH (8015D)	BTEX (8021)	Chlorides
H243138																	
1	BH24-01 0FT		1			✓					✓		05/31/24	8:00	✓	✓	✓
2	BH24-01 1FT													8:10			
3	BH24-01 2FT													8:20			
4	BH24-01 3FT													8:30			
5	BH24-01 4FT													8:40			
6	BH24-02 0FT													9:00			
7	BH24-02 1FT													9:10			
8	BH24-02 2FT													9:20			
9	BH24-02 3FT													9:30			
10	BH24-02 4FT													9:40			

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Wyatt Wadleigh	Date: 6-4-24 Time: 1420	Received By: Tamara Oldaker	Verbal Result: ☐ Yes ☐ No Add'l Phone #: All Results are emailed. Please provide Email address:
Relinquished By:	Date: Time:	Received By:	REMARKS: CC: Wwadleigh@vertex.ca

Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Observed Temp. °C -1.2 Corrected Temp. °C	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) T.O.	Turnaround Time: Standard ☐ Rush ☐ #1420 TO 6/4/24 Thermometer ID #113 Correction Factor -0.5°C

Bacteria (only) Sample Condition: Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No Observed Temp. °C Corrected Temp. °C

FORM-006 R 3.2 10/07/21

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com

CARDINAL Laboratories

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Vertex (BTA)
Project Manager: Chance Dixon
Address: on file
City: State: Zip:
Phone #: Fax #:
Project #: 24E-02760 Project Owner:
Project Name: State 2 8016 JV-P #001
Project Location:
Sampler Name: Wyatt Wadleish

BILL TO
P.O. #: On file
Company: BTA
Attn: On file
Address:
City:
State: Zip:
Phone #:
Fax #:

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	TPH (8015D)	BTEX (8021)	Chlorides
H243138																	
11	BH24-03 0FT		1			✓					✓		05/31/24	10:00	✓	✓	✓
12	BH24-03 1FT													10:10			
13	BH24-03 2FT													10:20			
14	BH24-03 3FT													10:30			
15	BH24-03 4FT													10:40			

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Relinquished By: Wyatt Wadleish Date: 6-4-24 Time: 1420 Received By:
Relinquished By: Date: Time: Received By:

Delivered By: (Circle One) Sampler - UPS - Bus - Other:
Observed Temp. °C 1.2 Corrected Temp. °C
Sample Condition: Cool Yes / Intact Yes — Cool No / Intact No
CHECKED BY: (Initials) CC.

Verbal Result: ☐ Yes ☐ No Add'l Phone #:
All Results are emailed. Please provide Email address:
REMARKS: CC: wwadleish@vertex.ca
Turnaround Time: Standard ☐ Rush ☐ Bacteria (only) Sample Condition: Cool Yes / Intact Yes — Cool No / Intact No
Thermometer ID #113 #140 Correction Factor -0.5°C CC. 6/4/24
Observed Temp. °C Corrected Temp. °C

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Oil Conservation Division
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Santa Fe, NM 87505

QUESTIONS

Action 356048

QUESTIONS

Operator: BTA OIL PRODUCERS, LLC 104 S Pecos Midland, TX 79701	OGRID: 260297
	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nOY1701037701**
Incident Name	**NOY1701037701 STATE 2 8016 JV-P #001 @ 30-025-27486**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Closure Report Received**
Incident Well	**[30-025-27486] STATE 2 8016 JV-P #001**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	State 2 8016 JV-P #001
Date Release Discovered	
Surface Owner	State

Incident Details	
Please answer all the questions in this group.	
Incident Type	Produced Water Release
Did this release result in a fire or is the result of a fire	No
Did this release result in any injuries	No
Has this release reached or does it have a reasonable probability of reaching a watercourse	No
Has this release endangered or does it have a reasonable probability of endangering public health	No
Has this release substantially damaged or will it substantially damage property or the environment	No
Is this release of a volume that is or may with reasonable probability be detrimental to fresh water	No

Nature and Volume of Release	
Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.	
Crude Oil Released (bbls) Details	*Not answered.*
Produced Water Released (bbls) Details	Cause: Other | Water Tank | Produced Water | Released: 0 BBL (Unknown Released Amount) | Recovered: 0 BBL | Lost: 0 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
Condensate Released (bbls) Details	*Not answered.*
Natural Gas Vented (Mcf) Details	*Not answered.*
Natural Gas Flared (Mcf) Details	*Not answered.*
Other Released Details	*Not answered.*
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	*Not answered.*

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QUESTIONS (continued)

Operator: BTA OIL PRODUCERS, LLC 104 S Pecos Midland, TX 79701	OGRID: 260297
	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	**No, according to supplied volumes this does not appear to be a "gas only" report.**
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	**Yes**
Reasons why this would be considered a submission for a notification of a major release	**From paragraph A. "Major release" determine using:** **(1) an unauthorized release of a volume, excluding gases, of 25 barrels or more.**
With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.	

Initial Response	
The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury.	
The source of the release has been stopped	True
The impacted area has been secured to protect human health and the environment	True
Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices	True
All free liquids and recoverable materials have been removed and managed appropriately	True
If all the actions described above have not been undertaken, explain why	*Not answered.*
Per Paragraph (4) of Subsection B of 19.15.29.8 NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of actions to date in the follow-up C-141 submission. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC), please prepare and attach all information needed for closure evaluation in the follow-up C-141 submission.	

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

I hereby agree and sign off to the above statement	Name: BTA VERTEX Title: Environmental Manager Email: rramos@btaoil.com Date: 06/19/2024

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QUESTIONS (continued)

Operator: BTA OIL PRODUCERS, LLC 104 S Pecos Midland, TX 79701	OGRID: 260297
	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Site Characterization	
Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
What is the shallowest depth to groundwater beneath the area affected by the release in feet below ground surface (ft bgs)	Between 100 and 500 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Greater than 5 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Greater than 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Greater than 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 1000 (ft.) and ½ (mi.)
Any other fresh water well or spring	Between 1000 (ft.) and ½ (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Between 1000 (ft.) and ½ (mi.)
A wetland	Between 1 and 5 (mi.)
A subsurface mine	Greater than 5 (mi.)
An (non-karst) unstable area	Greater than 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Greater than 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
Requesting a remediation plan approval with this submission	Yes
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.	
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	Yes
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
On what estimated date will the remediation commence	05/31/2024
On what date will (or did) the final sampling or liner inspection occur	05/31/2024
On what date will (or was) the remediation complete(d)	05/31/2024
What is the estimated surface area (in square feet) that will be remediated	0
What is the estimated volume (in cubic yards) that will be remediated	0
These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.	
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: BTA OIL PRODUCERS, LLC 104 S Pecos Midland, TX 79701	OGRID: 260297
	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Remediation Plan (continued)	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
(Select all answers below that apply.)	
Is (or was) there affected material present needing to be removed	Yes
Is (or was) there a power wash of the lined containment area (to be) performed	Yes
OTHER (Non-listed remedial process)	*Not answered.*
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
I hereby agree and sign off to the above statement	Name: BTA VERTEX Title: Environmental Manager Email: rramos@btaoil.com Date: 06/19/2024
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: BTA OIL PRODUCERS, LLC 104 S Pecos Midland, TX 79701	OGRID: 260297
	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Liner Inspection Information	
Last liner inspection notification (C-141L) recorded	***{Unavailable.}***
Was all the impacted materials removed from the liner	*Unavailable.*

Remediation Closure Request	
Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.	
Requesting a remediation closure approval with this submission	Yes
Have the lateral and vertical extents of contamination been fully delineated	**Yes**
Was this release entirely contained within a lined containment area	**Yes**
What was the total surface area (in square feet) remediated	0
What was the total volume (cubic yards) remediated	0
Summarize any additional remediation activities not included by answers (above)	Site was sampled to determine if any remnant impacts remained underneath the lined containment.

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

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

I hereby agree and sign off to the above statement	Name: BTA VERTEX Title: Environmental Manager Email: rramos@btaoil.com Date: 06/19/2024

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CONDITIONS

Action 356048

CONDITIONS

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	Action Number: 356048
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	Remediation closure approved.	6/24/2024
amaxwell	A reclamation report will not be accepted until reclamation of the release area, including areas reasonably needed for production or drilling activities, is complete and meet the requirements of 19.15.29.13 NMAC. Areas not reasonably needed for production or drilling activities will still need to be reclaimed and revegetated as early as practicable.	6/24/2024
amaxwell	The reclamation report will need to include: Executive Summary of the reclamation activities; Scaled Site Map including sampling locations; Analytical results including, but not limited to, results showing that any remaining impacts meet the reclamation standards and results to prove the backfill is non-waste containing; At least one (1) representative 5-point composite sample will need to be collected from the backfill material that will be used for the reclamation of the top four feet of the excavation. OCD reserves the right to request additional sampling if needed; pictures of the backfilled areas showing that the area is back, as nearly as practical, to the original condition or the final land use and maintain those areas to control dust and minimize erosion to the extent practical; pictures of the top layer, which is either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater; and a revegetation plan.	6/24/2024