General Information

NMOCD District:	District 2	Incident ID:	nAPP2431945579
Landowner:	State	Facility:	fAPP2123053374
Client:	XTO Energy, Inc.	Site Location:	James Ranch Unit DI 11 Battery
Date:	December 14, 2024	Project #:	24E-04947
Client Contact:	Colton Brown	Phone #:	575.988.7329
Vertex PM:	Chad Hensley	Phone #:	575.200.6167

Objective

The objective of the environmental remediation work plan is to identify exceedances found during the site assessment/characterization activity and propose an appropriate remediation technique to address the produced water release at James Ranch Unit DI 11 Battery. The release occurred due to pump failure and resulted in 55 barrels (bbl) of produced water being released on the facility pad, shown on Figure 1 (Attachment 1). Areas of environmental concern identified and delineated include south of the pipe rack and east of the tank battery on the east side of the pad. Closure criteria have been selected as per New Mexico Administrative Code 19.15.29. The closure criteria for the site are presented below in Table 1.

Table 1. Closure Criteria for Soils Impacted by a Release DTGW <50 feet bgs

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

TDS – Total dissolved solids
TPH – Total petroleum hydrocarbons = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO),
BTEX - Benzene, toluene, ethylbenzene, and xylenes

Site Assessment/Characterization

Vertex performed site characterization activities on November 25 and 26, 2024. A total of 14 sample points were established, and 28 samples were collected for field screening. Samples were obtained at two discrete depths for horizontal delineation. Boreholes were advanced and samples were collected with hand tools. Borehole depths did not exceed 2 feet below ground surface due to refusal at a caliche layer. In total, 28 samples were submitted to Eurofins Environmental Testing, Albuquerque, New Mexico, for analysis. The sample locations are presented on Figure 1 (Attachment 1). Laboratory analysis results have been compared to the above noted closure criteria and the results from the characterization activity are presented in Table 2 (Attachment 2). Exceedances to reclamation and remediation criteria are identified in the table as bold with grey background. Daily field reports and laboratory data reports are included in Attachments 3 and 4, respectively. All applicable research as it pertains to closure criteria selection is presented in Attachment 5.

Proposed Remedial Activities

General

The release area will be remediated to closure criteria. Areas identified with contaminant concentrations above closure criteria will be remediated through excavation. Laboratory results from the site assessment/characterization have been referenced to estimate both the vertical and horizontal limits of the impacts and the volume of soil to be removed. Soil will be excavated to the extent of the known

impacts or in 2 foot increments, whichever is less. Field screening will be utilized to confirm removal of impacted soil below the applicable closure criteria. Excavated soils will be stored on a 30mil liner prior to disposal at an approved facility. Once excavation is complete, confirmatory samples will be collected and laboratory analysis completed to confirm closure criteria guidelines are met. Excavations will be backfilled with clean soil sourced locally.

nAPP2431945579 (November 13, 2024) – Produced Water Released onto Pad

Field screening and laboratory analysis were utilized to find the approximate horizontal and vertical extents of the spill area. A total of 28 samples were collected for analysis. Exceedances to closure criteria identified south of the pipe rack and east of the tank battery will be remediated to closure criteria via excavation. Heavy equipment will be used to excavate open areas on the pad to remove contaminated soil. A hydrovac truck may be utilized to identify utility and buried pipelines where necessary, and hand tools will be utilized to remove contaminated soil in close proximity to equipment, buried utilities, and pipelines. Confirmation samples will be collected as per New Mexico Oil Conservation Division guidance and submitted for laboratory analysis of all applicable parameters. Surfaces of the final extents of the excavation will meet the most stringent NMOCD closure criteria. The estimated remediation area is approximately 11,098 square feet as presented on Figure 1 (Attachment 1). Excavation is planned to be completed within 90 days of approval of this Environmental Site Remediation Work Plan.

Should you have any questions or concerns, please do not hesitate to contact Chad Hensley at 575.200.6167 or chensley@vertexresource.com.

Lakin Pullman

Lakin Pullman, B.Sc.
ENVIRONMENTAL SPECIALIST, REPORTING

December 14, 2024
Date

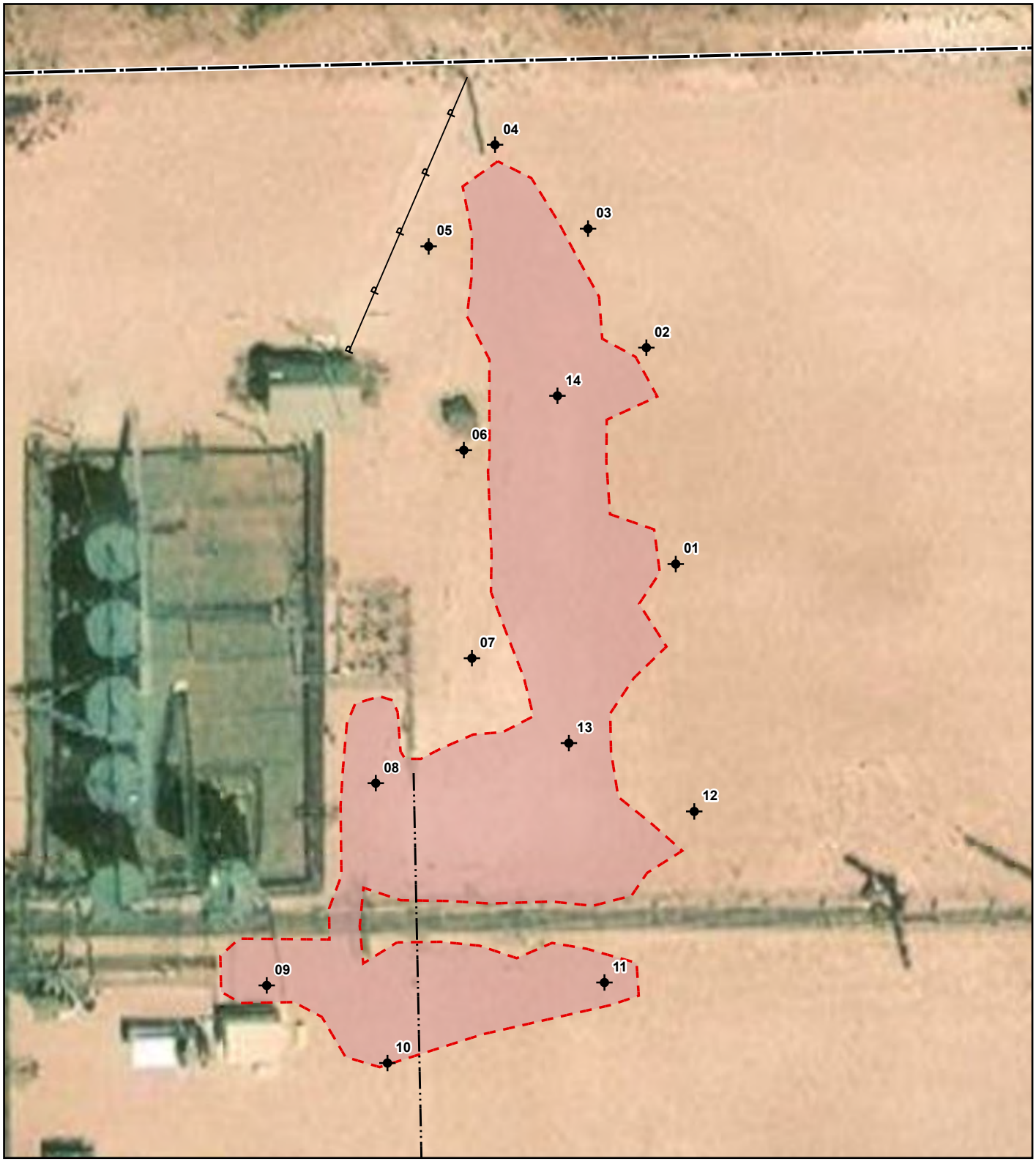
Chad Hensley, B. Sc., GCNR
SENIOR PROJECT MANAGER, REPORT REVIEW

December 15, 2024
Date

Attachments

Attachment 1. Characterization Sampling Site Schematic
Attachment 2. Initial Characterization Laboratory Results
Attachment 3. Daily Field Reports with Photographs
Attachment 4. Laboratory Data Reports with Chain of Custody Forms
Attachment 5. Closure Criteria Research

ATTACHMENT 1



Borehole (Prefixed by "BH24-")
Buried Pipeline
Approximate Lease Boundary
Buried Electrical Line
Release Area (~11,098 sq.ft.)

VERTEX

0 5 10 20 ft
NAD 1983 UTM Zone 13N
Date: Dec 10/24

Map Center:
Lat: 32.391171°N,
Long:103.89881°W

N

Characterization Sampling Site Schematic
JRU DI 11 Battery

FIGURE: 1

XTO ENERGY

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

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

VERSATILITY. EXPERTISE.

Document Path: S:\04 - Geomatics\1-Projects\ US PROJECTS\XTO Energy\2024\24E-04947 - JRU DI 11 Battery\Project\24E-04947.aprx

ATTACHMENT 2

Client Name: XTO Energy, Inc.
Site Name: James Ranch Unit DI 11 Battery
NMOCD Tracking #: napp2431945579
Project #: 24E-04947
Lab Report: H247288

Table 2. Initial Characterization Laboratory Results

Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene (mg/kg)	BTEX (Total) (mg/kg)	Gasoline Range Organics (GRO) (mg/kg)	Diesel Range Organics (DRO) (mg/kg)	Motor Oil Range Organics (MRO) (mg/kg)	(GRO + DRO) (mg/kg)	Total Petroleum Hydrocarbons (TPH) (mg/kg)	Chloride Concentration (mg/kg)
			Depth to Groundwater <50							
BH24-01	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	48
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	128
BH24-02	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	128
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	112
BH24-03	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	176
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	32
BH24-04	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	64
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	64
BH24-05	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	32
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	48
BH24-06	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	32
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	64
BH24-07	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	96
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	80
BH24-08	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**3440**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**1860**
BH24-09	0	November 26, 2024	ND	ND	ND	nn	ND	ND	ND	**2220**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	48
BH24-10	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**1200**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	32
BH24-11	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**1280**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	112
BH24-12	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	64
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	112
BH24-13	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**2760**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**3400**
BH24-14	0	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	**7520**
	2	November 26, 2024	ND	ND	ND	ND	ND	ND	ND	496

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

ATTACHMENT 3

Daily Site Visit Report

Client:	XTO Energy Inc. (US)	Inspection Date:	11/25/2024
Site Location Name:	JRU DI 11 Battery	Report Run Date:	12/2/2024 3:44 PM
Client Contact Name:	Amy Ruth	API #:	
Client Contact Phone #:	432-661-0571		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	11/25/2024 9:45 AM
Departed Site	11/25/2024 3:30 PM

Daily Site Visit Report

Site Sketch

Site Sketch

Daily Site Visit Report

Field Notes

15:11 Delineate spill area

Next Steps & Recommendations

1 Send samples to lab for analysis

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: West
	
BH24-01 @ 2’	BH24-02 @ 2’
Viewing Direction: Southwest	**Viewing Direction**: North
	
BH24-03 @ 2’	BH24-04 @ 2’

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: Southeast
	
BH24-05 @ 2’	BH24-06 @ 2’

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Riley Plogger

Signature: 

Daily Site Visit Report

Client:	XTO Energy Inc. (US)	Inspection Date:	11/26/2024
Site Location Name:	JRU DI 11 Battery	Report Run Date:	12/2/2024 3:44 PM
Client Contact Name:	Amy Ruth	API #:	
Client Contact Phone #:	432-661-0571		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	11/26/2024 10:15 AM
Departed Site	11/26/2024 3:15 PM

Daily Site Visit Report

Site Sketch

Daily Site Visit Report

Field Notes

14:33 Finish delineation on spill area

Next Steps & Recommendations

1 Send samples off to lab for analysis

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: East
	
BH24-07 @ 2’	BH24-08 @ 2’
Viewing Direction: West	**Viewing Direction**: North
	
BH24-09 @ 2’	BH24-10 @ 2’

Daily Site Visit Report

Viewing Direction: West	**Viewing Direction**: West
	
BH24-11 @ 2’	BH24-12 @ 2’
Viewing Direction: West	**Viewing Direction**: South
	
BH24-13 @ 2’	BH24-14 @ 2’

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Riley Plogger

Signature:

ATTACHMENT 4

CARDINAL Laboratories

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

December 05, 2024

CHAD HENSLEY

VERTEX RESOURCE

3101 BOYD DRIVE

CARLSBAD, NM 88220

RE: JRU DIII BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 11/27/24 12:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. 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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 01 @ 0' (H247288-01)

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	12/03/2024	ND	2.25	113	2.00	4.29	
Toluene*	<0.050	0.050	12/03/2024	ND	2.17	109	2.00	3.40	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.19	109	2.00	2.97	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.52	109	6.00	2.82	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.2 %* *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	**48.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *89.4 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *74.7 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 01 @ 2' (H247288-02)

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	12/03/2024	ND	2.25	113	2.00	4.29	
Toluene*	<0.050	0.050	12/03/2024	ND	2.17	109	2.00	3.40	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.19	109	2.00	2.97	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.52	109	6.00	2.82	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *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	**128**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *88.8 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *75.0 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 02 @ 0' (H247288-03)

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	12/03/2024	ND	2.25	113	2.00	4.29	
Toluene*	<0.050	0.050	12/03/2024	ND	2.17	109	2.00	3.40	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.19	109	2.00	2.97	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.52	109	6.00	2.82	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *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	**128**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *95.8 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *81.6 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 02 @ 2' (H247288-04)

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	12/03/2024	ND	2.25	113	2.00	4.29	
Toluene*	<0.050	0.050	12/03/2024	ND	2.17	109	2.00	3.40	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.19	109	2.00	2.97	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.52	109	6.00	2.82	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *100 %* *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	**112**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *82.3 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *68.5 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 03 @ 0' (H247288-05)

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	12/03/2024	ND	2.25	113	2.00	4.29	
Toluene*	<0.050	0.050	12/03/2024	ND	2.17	109	2.00	3.40	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.19	109	2.00	2.97	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.52	109	6.00	2.82	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.3 %* *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	**176**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *92.8 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *76.3 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 03 @ 2' (H247288-06)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	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	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *97.4 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *81.5 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 04 @ 0' (H247288-07)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	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	**64.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *80.3 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *66.2 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 04 @ 2' (H247288-08)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *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	**64.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *85.4 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *72.6 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 05 @ 0' (H247288-09)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *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	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *87.7 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *72.4 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 05 @ 2' (H247288-10)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	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	**48.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *86.9 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *74.7 %* *49.1-148*

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

Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 06 @ 0' (H247288-11)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *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	12/03/2024	ND	432	108	400	3.64	

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	12/02/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *92.6 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *76.8 %* *49.1-148*

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

Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 06 @ 2' (H247288-12)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	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	**64.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *97.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *82.4 %* *49.1-148*

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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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 07 @ 0' (H247288-13)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	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	**96.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *91.7 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *76.8 %* *49.1-148*

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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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 07 @ 2' (H247288-14)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *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	**80.0**	16.0	12/03/2024	ND	432	108	400	3.64	

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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *101 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *85.3 %* *49.1-148*

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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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 08 @ 0' (H247288-15)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3440**	16.0	12/03/2024	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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *103 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *85.7 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 08 @ 2' (H247288-16)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1860**	16.0	12/03/2024	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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *93.4 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *78.4 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 09 @ 0' (H247288-17)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2220**	16.0	12/03/2024	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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *92.9 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *78.6 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 09 @ 2' (H247288-18)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	12/03/2024	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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *111 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *94.3 %* *49.1-148*

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

Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 10 @ 0' (H247288-19)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1200**	16.0	12/03/2024	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	12/03/2024	ND	186	93.2	200	1.74	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	179	89.5	200	0.345	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *94.4 %* *48.2-134*

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

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 10 @ 2' (H247288-20)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/03/2024	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	12/02/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/02/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/02/2024	ND					

Surrogate: 1-Chlorooctane *87.3 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *83.3 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 11 @ 0' (H247288-21)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1280**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *86.5 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *82.2 %* *49.1-148*

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 11 @ 2' (H247288-22)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *92.5 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *87.9 %* *49.1-148*

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CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 12 @ 0' (H247288-23)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *97.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *92.2 %* *49.1-148*

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CARDINAL Laboratories

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

Analytical Results For:

VERTEX RESOURCE
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 12 @ 2' (H247288-24)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *96.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *90.6 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 13 @ 0' (H247288-25)

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	12/03/2024	ND	2.19	110	2.00	4.00	
Toluene*	<0.050	0.050	12/03/2024	ND	2.24	112	2.00	0.856	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.20	110	2.00	0.463	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.89	115	6.00	0.432	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2760**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *100 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *96.2 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 13 @ 2' (H247288-26)

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	12/03/2024	ND	2.06	103	2.00	3.96	
Toluene*	<0.050	0.050	12/03/2024	ND	2.14	107	2.00	3.38	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.13	107	2.00	3.23	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.34	106	6.00	3.20	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3400**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *97.2 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *90.3 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 14 @ 0' (H247288-27)

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	12/03/2024	ND	2.06	103	2.00	3.96	
Toluene*	<0.050	0.050	12/03/2024	ND	2.14	107	2.00	3.38	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.13	107	2.00	3.23	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.34	106	6.00	3.20	
Total BTEX	<0.300	0.300	12/03/2024	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**7520**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *105 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *101 %* *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
CHAD HENSLEY
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	11/27/2024	Sampling Date:	11/26/2024
Reported:	12/05/2024	Sampling Type:	Soil
Project Name:	JRU DIII BATTERY	Sampling Condition:	Cool & Intact
Project Number:	23E-04947	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO		

Sample ID: BH 24 - 14 @ 2' (H247288-28)

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	12/03/2024	ND	2.06	103	2.00	3.96	
Toluene*	<0.050	0.050	12/03/2024	ND	2.14	107	2.00	3.38	
Ethylbenzene*	<0.050	0.050	12/03/2024	ND	2.13	107	2.00	3.23	
Total Xylenes*	<0.150	0.150	12/03/2024	ND	6.34	106	6.00	3.20	
Total BTEX	<0.300	0.300	12/03/2024	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**496**	16.0	12/03/2024	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	12/03/2024	ND	190	95.1	200	3.63	
DRO >C10-C28*	<10.0	10.0	12/03/2024	ND	173	86.6	200	3.43	
EXT DRO >C28-C36	<10.0	10.0	12/03/2024	ND					

Surrogate: 1-Chlorooctane *96.2 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *93.1 %* *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

Notes and Definitions

S-05	The surrogate recovery is outside of lab established statistical control limits but still within method limits. Data is not adversely affected.
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

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	vertex
Project Manager:	Chad Hensley
Address:	3101 Boyd dr
City:	Carlsbad State: NM Zip: 88220
Phone #:	575-200-6167 Fax #:
Project #:	24E-04947 Project Owner: Amy Ruth
Project Name:	Jru D111Battery
Project Location:	
Sampler Name:	Riley Plogger

BILL TO

P.O. #:	2147571001
Company:	XTO
Attn:	
Address:	3104 E Greene
City:	Carlsbad
State:	NM Zip: 88220
Phone #:	575-887-7329
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	SAMPLING TIME	Chloride	TPH (GRO, DRO, MRO)	BTEX
H247288 1	BH24-01 @ 0'	X	X			X					X		11-26-24	9:39	X	X	X
2	01 @ 2'													9:43			
3	02 @ 0'													9:50			
4	02 @ 2'													9:55			
5	03 @ 0'													10:01			
6	03 @ 2'													10:07			
7	04 @ 0'													10:15			
8	04 @ 2'													10:22			
9	05 @ 0'													10:30			
10	05 @ 2'													10:37			

Relinquished By:	Date: ~~12:55~~ 11-27-24	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
R. M	Time: 12:55	S Rodriguez	All Results are emailed. Please provide Email address: CHensley@vertexresources.com
Relinquished By:	Date:	Received By:	RPlogger@vertexresource.com
	Time:		REMARKS: Incident #nAPP2427862444

Delivered By: (Circle One)	Observed Temp. °C 0.3	Sample Condition Cool: ☑ Yes ☐ No	Intact: ☐ Yes ☐ No	CHECKED BY: (Initials) SR	Turnaround Time: Standard ☑ Rush ☐
Sampler - UPS - Bus - Other:	Corrected Temp. °C 0.3				Thermometer ID #140 Correction Factor -0.6°C

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

FORM-006 R 3.3 08/05/24

† 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
Project Manager:	C. Hensley
Address:	3101 Boyd dr
City:	Carlsbad, NM State: NM Zip: 88220
Phone #:	575-200-6167 Fax #:
Project #:	24E-04947 Project Owner: Amy Ruth
Project Name:	JRU D111 Battery
Project Location:	
Sampler Name:	R. Plogger

BILL TO

P.O. #:	214757 1001
Company:	XTO
Attn:	
Address:	3104 E Greene
City:	Carlsbad
State:	NM Zip: 88220
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	SAMPLING TIME	Chloride	TPH (GRO, DRO, MRO)	BTEX
H247288																	
11	BH24-06 @ 0'	C	1			X					X		11-26-24	10:45	X	X	X
12	06 2'													10:55			
13	07 0'													11:05			
14	07 2'													11:15			
15	08 0'													11:27			
16	08 2'													11:39			
17	09 0'													11:47			
18	09 2'													11:54			
19	10 0'													12:05			
20	10 2'	↓	↓			↓					↓		↓	12:17	↓	↓	↓

Relinquished By:	Date: 11-27-24	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 12:55		All Results are emailed. Please provide Email address:
Relinquished By:	Date:	Received By:	REMARKS: Incident # nAPP2427862444
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other:

Observed Temp. °C 0.3 Corrected Temp. °C -0.3

Sample Condition: Cool ☐ Yes ☐ No Intact ☑ Yes ☐ No

CHECKED BY: (Initials) SR

Turnaround Time: Standard ☑ Rush ☐

Thermometer ID #140 Correction Factor -0.6°C

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

FORM-006 R 3.3 08/05/24

† 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
Project Manager:	C. Hensley
Address:	3101 Boyd dr
City:	Carlsbad State: NM Zip: 88220
Phone #:	575-200-6167 Fax #:
Project #:	24E-04947 Project Owner: Amy Ruth
Project Name:	JRU D1 11 Battery
Project Location:	
Sampler Name:	R. Plogger

BILL TO

P.O. #:	2147571001
Company:	XTO
Attn:	
Address:	3104 E Greene
City:	Carlsbad
State:	NM Zip: 88220
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:	(C)E / COOL	OTHER :	SAMPLING DATE	SAMPLING TIME	Chloride	TPH (GRO, DRO, MRO)	BTEX
H247288	BH24 - 11 @ 0'	G	-			X					C		11-26-24	12:50	X	X	X
21	11 2'													1:02			
22	12 0'													1:15			
23	12 2'													1:24			
24	13 0'													1:45			
25	13 2'													1:58			
26	14 0'													2:17			
27	14 2'													2:27			
28																	

Relinquished By:	Date: 11-27-24	Received By:	
	Time: 12:55	S Rodriguez	
Relinquished By:	Date:	Received By:	
	Time:		

Verbal Result: ☐ Yes ☐ No Add'l Phone #:
All Results are emailed. Please provide Email address:

REMARKS: Incident # nAPP2427862444

Delivered By: (Circle One)	Observed Temp. °C 0.3	Sample Condition Cool Intact	CHECKED BY: (Initials)	Turnaround Time: ☑ Standard ☐ Rush
Sampler - UPS - Bus - Other:	Corrected Temp. °C -0.3	☐ Yes ☐ Yes ☐ No ☐ No	SR	Thermometer ID #140 Correction Factor -0.6°C

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

FORM-006 R 3.3 08/05/24

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

ATTACHMENT 5

Closure Criteria Determination				
Site Name: James Ranch Unit DI 11 Battery				
Release Coordinates: 32.391050,-103.898815		X: 603572	Y: 3584315	
Site Specific Conditions		Value	Unit	Reference
Reference	Depth to Groundwater (nearest reference)	500 ft<		1
1	Distance between release and nearest DTGW reference	**1 - 5 mi**		
	Date of nearest DTGW reference measurement	**October 29, 2013**		
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	1000ft - 2000ft		2
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	0.5 - 1 mi		3
4	Within 300 feet from an occupied residence, school, hospital, institution or church	1 - 5 mi		4
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**	1 - 5 mi		5
	ii) Within 1000 feet of any fresh water well or spring	1 - 5 mi		5
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)	6
7	Within 300 feet of a wetland	2000ft - 0.5mi		7
8	Within the area overlying a subsurface mine	No	(Y/N)	8
	Distance between release and nearest registered mine	1 - 5 mi		
9	Within an unstable area (Karst Map)	**High**	Critical High Medium Low	9
	Distance between release and nearest unstable area	**Zero Feet - Overlying - or Within Area**		
10	Within a 100-year Floodplain	>500	year	10
	Distance between release and nearest FEMA Zone A (100-year Floodplain)	1 - 5 mi		
11	Soil Type	loam, clay loam, gypsiferous material		11
12	Ecological Classification	Loamy		12
13	Geology	Siltstone, gypsum, sandstone, and dolomite		13
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	<50'	<50' 51-100' >100'	

OSE POD 0.5 miles

12/10/2024, 4:11:35 PM

GIS WATERS PODs
- Active
- Pending

OSE District Boundary

Water Right Regulations
- Artesian Planning Area

NHD Flowlines
- Artificial Path
- Connector
- Stream River

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Esri, HERE, iPC, Esri, HERE, Garmin, iPC, Maxar

Online web user

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

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)	(R=POD has been replaced, O=orphaned, C=the file is closed)			(quarters are smallest to largest)						(NAD83 UTM in meters)				(In feet)	(In feet)	(In feet)
POD Number	**Code**	**Sub basin**	**County**	**Q64**	**Q16**	**Q4**	**Sec**	**Tws**	**Range**	**X**	**Y**	**Map**	**Distance**	**Well Depth**	**Depth Water**	**Water Column**
C 02723		CUB	ED	NE	NE	SW	15	22S	30E	606282.0	3584363.0 *		2710	651		
C 03679 POD1		C	ED	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2767	700	575	125
C 03587 POD3		CUB	ED	NE	SE	NW	07	22S	29E	601446.7	3586271.3		2888	80	47	33
C 02724		CUB	ED	SE	SE	NE	29	22S	30E	603860.0	3581329.0 *		2999	503		
C 03015		CUB	ED	NW	SE	SW	22	22S	30E	606099.0	3582353.0 *		3199	1316	262	1054
C 03531 POD7		CUB	ED	NW	NW	NE	12	22S	29E	600008.2	3586695.5		4285	100		
C 03531 POD2		CUB	ED	NW	NW	NE	12	22S	29E	600007.7	3586696.1		4286	110	68	42
C 03531 POD1		CUB	ED	NW	NW	NE	12	22S	29E	600001.2	3586721.9		4306	100	68	32
C 03531 POD6		CUB	ED	NW	NW	NE	12	22S	29E	599974.4	3586681.9		4306	100		
C 03531 POD3		CUB	ED	NW	NW	NE	12	22S	29E	599995.0	3586714.4		4307	105	68	37
C 03531 POD4		CUB	ED	NW	NW	NE	12	22S	29E	599994.5	3586761.8		4334	100		
C 03531 POD5		CUB	ED	NW	NW	NE	12	22S	29E	599991.5	3586804.9		4361	100		
C 02111		CUB	ED	NE	NE	NE	33	22S	30E	605505.0	3580336.0 *		4423	248	155	93
C 03531 POD8		CUB	ED	SW	SW	SE	01	22S	29E	600000.7	3586926.4		4424	100		
C 03587 POD4		CUB	ED	NE	SE	SE	14	22S	29E	599005.7	3583977.3		4578	79	57	22

Average Depth to Water: **162 feet**

Minimum Depth: **47 feet**

Maximum Depth: **575 feet**

Record Count: 15

UTM Filters (in meters):
Easting: 603572
Northing: 3584315
Radius: 005000

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

Point of Diversion Summary

quarters are 1=NW 2=NE 3=SW 4=SE
quarters are smallest to largest

NAD83 UTM in meters

Well Tag	POD Nbr	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map
	C 03679 POD1	NW	SE	NE	14	24S	33E	603567.1	3581547.1	

* UTM location was derived from PLSS - see Help

Driller License:	1654	**Driller Company:**	NOT WORKING FOR HIRE--SIRMAN DRILLING AND CONSTRUC		
Driller Name:	JOHN SIRMAN				
Drill Start Date:	2013-10-23	**Drill Finish Date:**	2013-10-29	**Plug Date:**	
Log File Date:	2013-11-07	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	20
Casing Size:	6.00	**Depth Well:**	700	**Depth Water:**	575

Water Bearing Stratifications:

Top	Bottom	Description
565	665	Sandstone/Gravel/Conglomerate

Casing Perforations:

Top	Bottom
560	620
660	700

Meter Information

Meter Number:	16576	**Meter Make:**	MASTERMETER
Meter Serial Number:	8112524	**Meter Multiplier:**	100.0000
Number of Dials:	6	**Meter Type:**	Diversion

Unit of Measure: Gallons **Reading Frequency:** Monthly (No Reading Expected)

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
2014-03-01	2014	29030.000	A	RPT		0.000	
2014-07-01	2014	49261.000	A	RPT		6.209	
2014-10-01	2014	68901.000	A	RPT		6.027	
2014-12-31	2014	84036.000	A	RPT		4.645	
2015-02-01	2015	89806.000	A	RPT		1.771	
2015-03-02	2015	92350.000	A	RPT		0.781	
2015-04-01	2015	96582.000	A	RPT		1.299	
2015-04-30	2015	104711.000	A	RPT		2.495	
2015-05-31	2015	111086.000	A	RPT		1.956	
2015-07-01	2015	118700.000	A	RPT		2.337	
2015-08-01	2015	123816.000	A	RPT		1.570	
2015-08-31	2015	130025.000	A	RPT		1.905	
2015-10-01	2015	135622.000	A	RPT		1.718	

YTD Meter Amounts:

Year	Amount
2014	16.881
2015	15.832

Water Right Summary

get image list

WR File Number:	C 03679	**Subbasin:**	C	**Cross Reference:**
Primary Purpose:	STK 72-12-1 LIVESTOCK WATERING			
Primary Status:	PMT Permit			
Total Acres:		**Subfile:**		**Header:**
Total Diversion:	3.000	**Cause/Case:**		
Owner:	MARK MCCLOY DOUBLE M RANCH			
Contact:	SCOTT DBA:GRR, INC GREGORY			

Documents on File

(acre-feet per annum)

Transaction Images	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/To	Acres	Diversion	Consumptive
get images	535375	72121	2013-10-11	PMT	LOG	C 03679	T		3.000	

Current Points of Diversion

POD Number	Well Tag	Source	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map	Other Location Desc
C 03679 POD1		Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		

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

12/10/24 3:27 PM MST **Water Rights Summary**

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE
ROSWELL

2013 NOV -7 A 11:11

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): C-3679	OSE FILE NUMBER(S): C-3679
WELL OWNER NAME(S): Mark McCloy McCloy Ranches	PHONE (OPTIONAL): 432-940-4459
WELL OWNER MAILING ADDRESS: P.O. Box 1076	CITY: Jal STATE: NM ZIP: 88252

WELL LOCATION (FROM GPS): LATITUDE 32 DEGREES 12 MINUTES 57.31 SECONDS N; LONGITUDE 103 32 15.31 W

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

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE: Hwy 128 mm 30 1/4 north

2. DRILLING & CASING INFORMATION

LICENSE NUMBER: 1654	NAME OF LICENSED DRILLER: John Sirmen		NAME OF WELL DRILLING COMPANY: Sirmen Drilling & Const. LLC
DRILLING STARTED: 10/23/13	DRILLING ENDED: 10/29/13	DEPTH OF COMPLETED WELL (FT): 700'-0	BORE HOLE DEPTH (FT): 700'-0
DEPTH WATER FIRST ENCOUNTERED (FT): 575			
COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☑ SHALLOW (UNCONFINED)			STATIC WATER LEVEL IN COMPLETED WELL (FT): 405.0
DRILLING FLUID: ☑ AIR ☐ MUD ☐ ADDITIVES – SPECIFY:			
DRILLING METHOD: ☑ ROTARY ☑ HAMMER ☐ CABLE TOOL ☐ OTHER – SPECIFY:			

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	560	10	PVC	Certa-Lok	6	DR-17	Blank
560	620	10	PVC	Certa lok	6	DR-17	.032 screen
620	660	10	PVC	Certa lok	6	DR-17	Blank
660	700	10	PVC	Certa lok	6	DR-17	.032 screen

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	20	10	3/8 hole plug Bentonite	6 sacks	gravity
65	700	10	3/8 gravel pack	4 yds	gravity

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
C-3679		535375

LOCATION 24S.33E.14 2-4-1

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	15	15	Red sand	☐ Y ☑ N	
15	35	20	white caliche	☐ Y ☑ N	
35	55	20	red sandstone	☐ Y ☑ N	
55	70	15	yellow sand	☐ Y ☑ N	
70	90	20	gray sandstone	☐ Y ☑ N	
90	110	20	red clay	☐ Y ☑ N	
110	120	10	gray shale	☐ Y ☑ N	
120	300	180	gray sandstone	☐ Y ☑ N	
300	335	35	brown shale	☐ Y ☑ N	
335	375	40	Brown sandstone	☐ Y ☑ N	
375	565	190	Red clay	☐ Y ☑ N	
565	665	100	Red sandstone	☑ Y ☐ N	20
665	700	35	Red clay	☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
		700		☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ☑ PUMP ☑ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 20

STATE ENGINEER OFFICE RECEIVED 2013 NOV -4 A 7:44

5. TEST; RIG SUPERVISION

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

MISCELLANEOUS INFORMATION:

none

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

none

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

John Sirman — John Sirman

SIGNATURE OF DRILLER / PRINT SIGNEE NAME

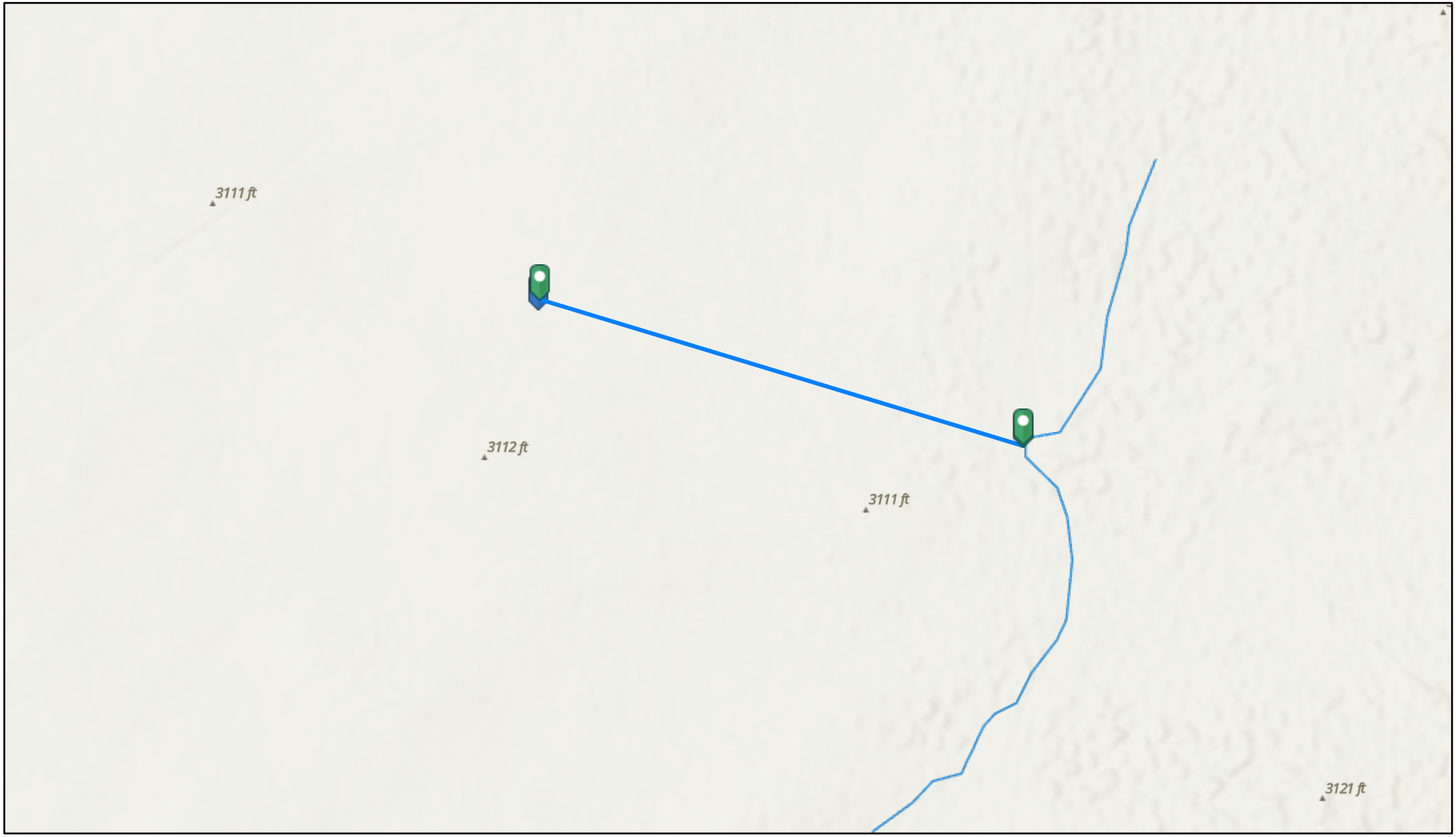
11/3/13

DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

02. JRU DI 11 1125ft from a watercourse



11/18/2024, 5:02:13 PM

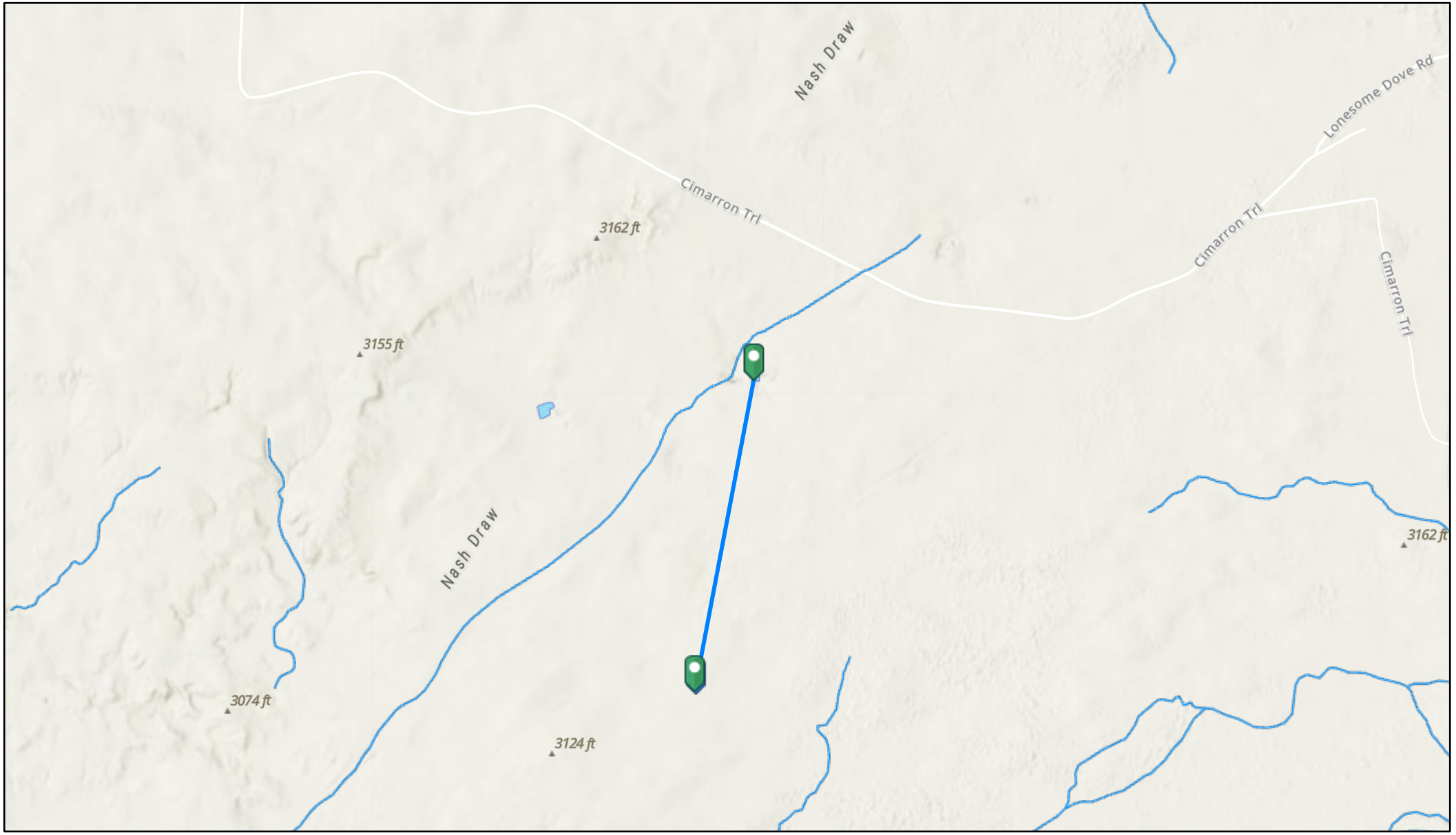
OSE Streams

1:4,514

0 0.03 0.07 0.13 mi

0 0.05 0.1 0.2 km

03. JRU DI 11 3025ft from a lake



11/18/2024, 5:06:23 PM

OSW Water Bodys

OSE Streams

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, NM OSE

New Mexico Oil Conservation Division

NM OCD Oil and Gas Map. http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=4d017f2306164de29fd2fb9f8f35ca75: New Mexico Oil Conservation Division

James Ranch Unit DI 11 Battery

Nearest Residence

Legend

- James Ranch Unit DI 11 Battery Release
- Nearest Residence 8,278 feet (1.57 miles)

James Ranch Unit DI 11 Battery Release

Google Earth

N

4000 ft

Active & Inactive Points of Diversion

(with Ownership Information)

		(acre ft per annum)				(R=POD has been replaced and no longer serves this file, C=the file is closed)				(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)			(meters)
WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q64	q16	q4	Sec	Tws	Range	X	Y	Map	Distance
C 01916	C	PRO	0.000	PERRY R BASS	ED	C 01916					SE	SW	NE	21	22S	30E	605068.0	3582947.0 *		2,027.2
C 02723	CUB	MON	0.000	U.S. DEPT. OF ENERGY, WIPP	ED	C 02723				Shallow	NE	NE	SW	15	22S	30E	606282.0	3584363.0 *		2,710.4
C 03679	C	STK	3.000	MARK MCCLOY DOUBLE M RANCH	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03696	C	PRO	0.000	CONCHO OIL AND GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03697	C	PRO	0.000	CONCHO OIL AND GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03698	C	PRO	0.000	CONCHO OIL AND GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03928	C	PRO	0.000	CONCHO OIL & GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03929	C	PRO	0.000	CONCHO OIL & GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03930	C	PRO	0.000	CONCHO OIL & GAS	ED	C 03679 POD1				Shallow	NW	SE	NE	14	24S	33E	603567.1	3581547.1		2,767.9
C 03587	CUB	MON	0.000	MOSAIC POTASH CARLSBAD INC	ED	C 03587 POD3				Shallow	NE	SE	NW	07	22S	29E	601446.7	3586271.3		2,888.6
C 02724	CUB	MON	0.000	U.S. DEPT. OF ENERGY, WIPP	ED	C 02724					SE	SE	NE	29	22S	30E	603860.0	3581329.0 *		2,999.9
C 03015	CUB	MON	0.000	U.S. DEPT OF ENERGY - WIPP	ED	C 03015				Artesian	NW	SE	SW	22	22S	30E	606099.0	3582353.0 *		3,199.2
C 04420	CUB	MON	0.000	TETRA TECH INC	ED	C 04420 POD1	NA				SW	SE	SE	32	21S	30E	603624.0	3588504.2		4,189.5
C 03531	CUB	EXP	0.000	MOSAIC CARLSBAD POTASH INC.	ED	C 03531 POD7				Shallow	NW	NW	NE	12	22S	29E	600008.2	3586695.5		4,285.7
					ED	C 03531 POD2				Shallow	NW	NW	NE	12	22S	29E	600007.7	3586696.1		4,286.5
					ED	C 03531 POD1				Shallow	NW	NW	NE	12	22S	29E	600001.2	3586721.9		4,306.2
					ED	C 03531 POD6				Shallow	NW	NW	NE	12	22S	29E	599974.4	3586681.9		4,306.4
					ED	C 03531 POD3				Shallow	NW	NW	NE	12	22S	29E	599995.0	3586714.4		4,307.2
					ED	C 03531 POD4				Shallow	NW	NW	NE	12	22S	29E	599994.5	3586761.8		4,334.2
					ED	C 03531 POD5				Shallow	NW	NW	NE	12	22S	29E	599991.5	3586804.9		4,361.1
C 02111	CUB	MIN	47.000	WESTERN AG-MINERALS CO.	ED	C 02111				Shallow	NE	NE	NE	33	22S	30E	605505.0	3580336.0 *		4,423.7
C 03531	CUB	EXP	0.000	MOSAIC CARLSBAD POTASH INC.	ED	C 03531 POD8				Shallow	SW	SW	SE	01	22S	29E	600000.7	3586926.4		4,424.2
C 03587	CUB	MON	0.000	MOSAIC POTASH CARLSBAD INC	ED	C 03587 POD4					NE	SE	SE	14	22S	29E	599005.7	3583977.3		4,578.8

Record Count: 23

Filters Applied:

UTM Filters (in meters):
Easting: 603572
Northing: 3584315
Radius: 005000

Sorted By: Distance

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

Water Right Summary

get image list

WR File Number:	C 01916	**Subbasin:**	C	**Cross Reference:**
Primary Purpose:	PRO 72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE			
Primary Status:	PMT Permit			
Total Acres:		**Subfile:**		**Header:**
Total Diversion:	0.000	**Cause/Case:**		
Owner:	PERRY R BASS			

Documents on File

(acre-feet per annum)

Transaction Images	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/To	Acres	Diversion	Consumptive
get images	465776	72121	1980-08-04	EXP	EXP	C 01916	T		3.000	

Current Points of Diversion

POD Number	Well Tag	Source	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map	Other Location Desc
C 01916			SE	SW	NE	21	22S	30E	605068.0	3582947.0 *		28 MILES ESE OF CARLSBAD NM

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

12/10/24 3:58 PM MST **Water Rights Summary**

National Flood Hazard Layer FIRMette

FEMA

103°54'14"W 32°23'43"N

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

1:6,000

103°53'37"W 32°23'13"N

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.

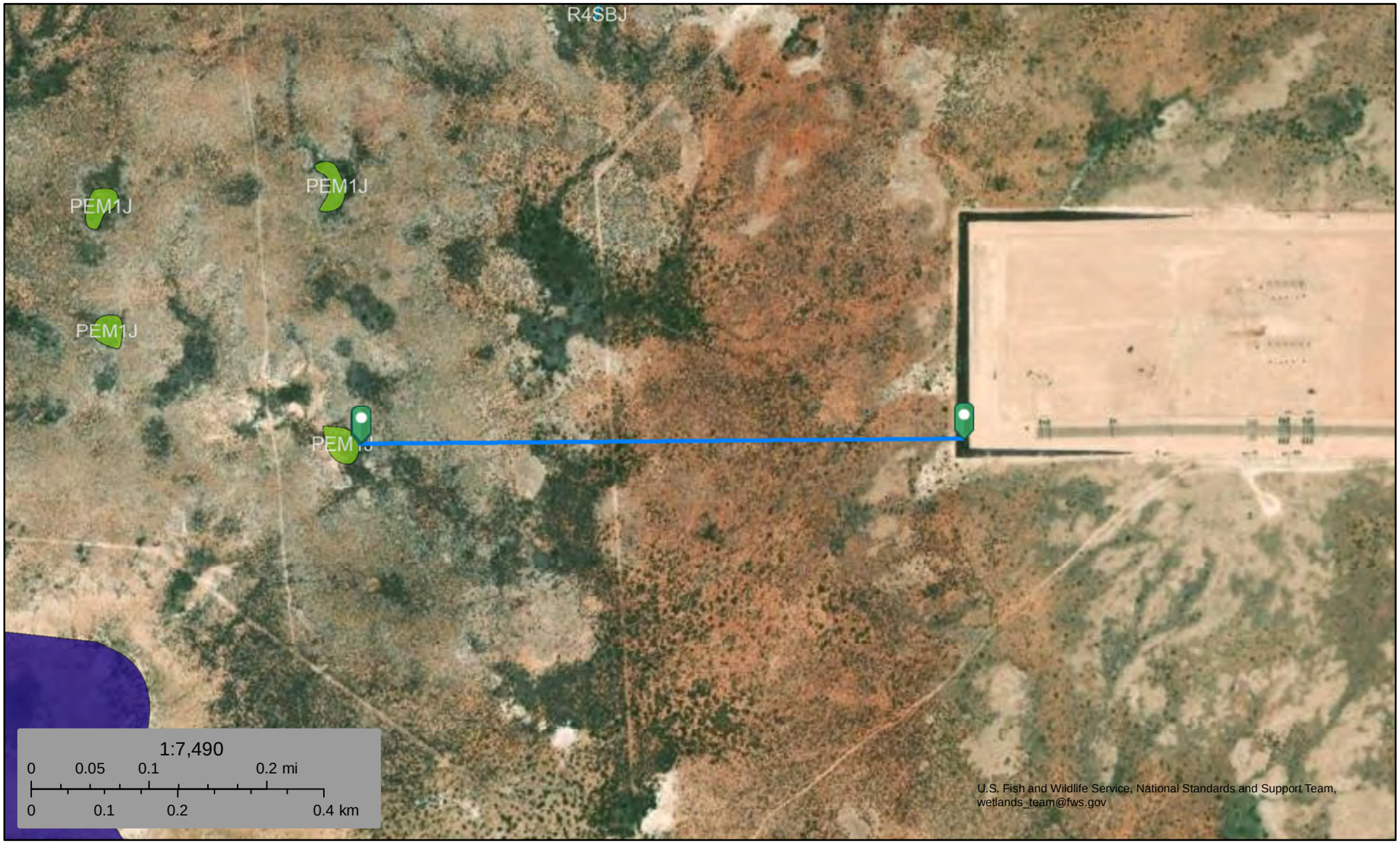
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/11/2024 at 1:36 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

JRU DI 11 0.43mi to a wetland



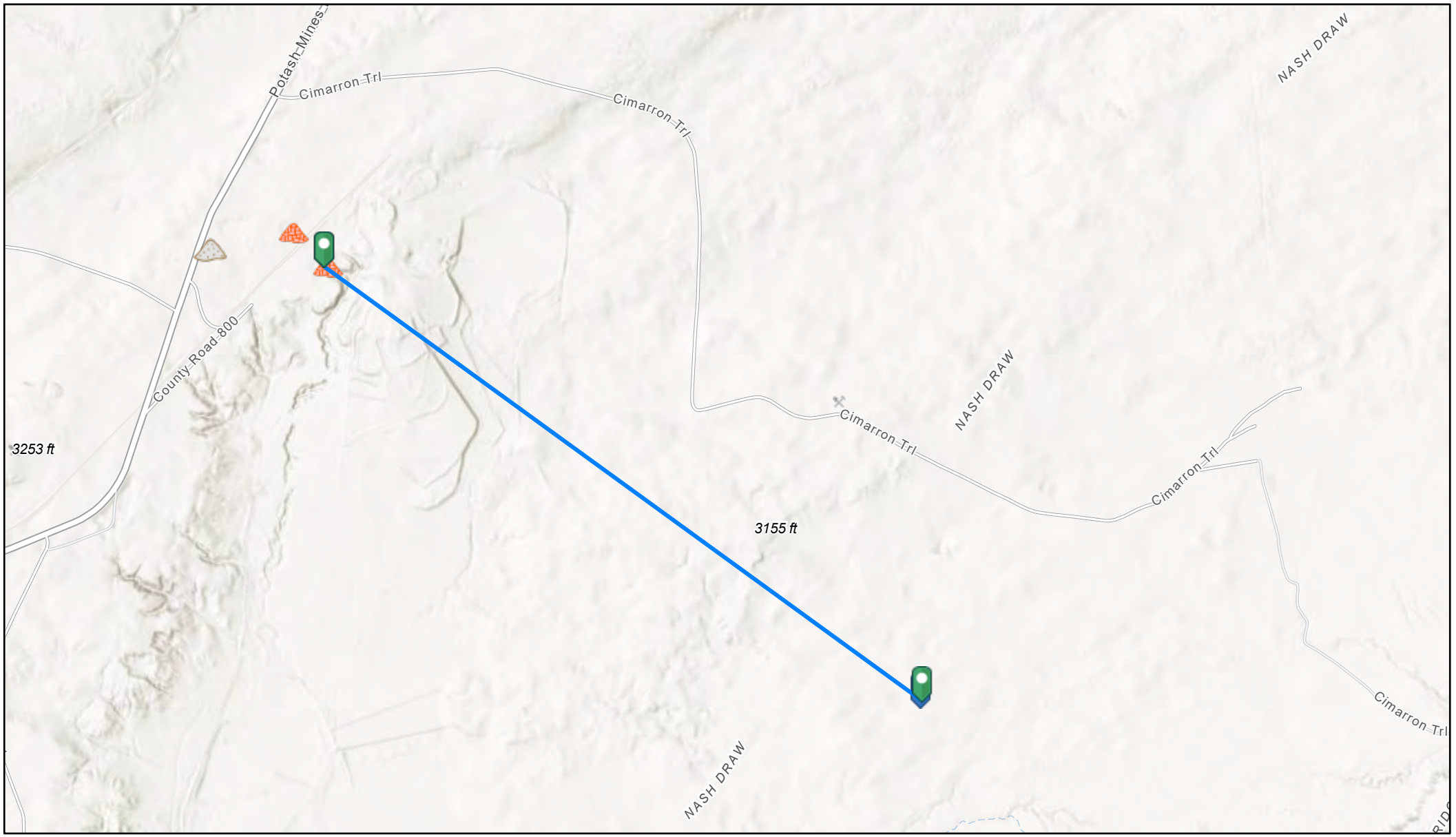
November 19, 2024

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.

JRU DI 11 2.69mi from a mine



11/18/2024, 5:59:10 PM

Registered Mines

Aggregate, Stone etc.

Potash

Salt

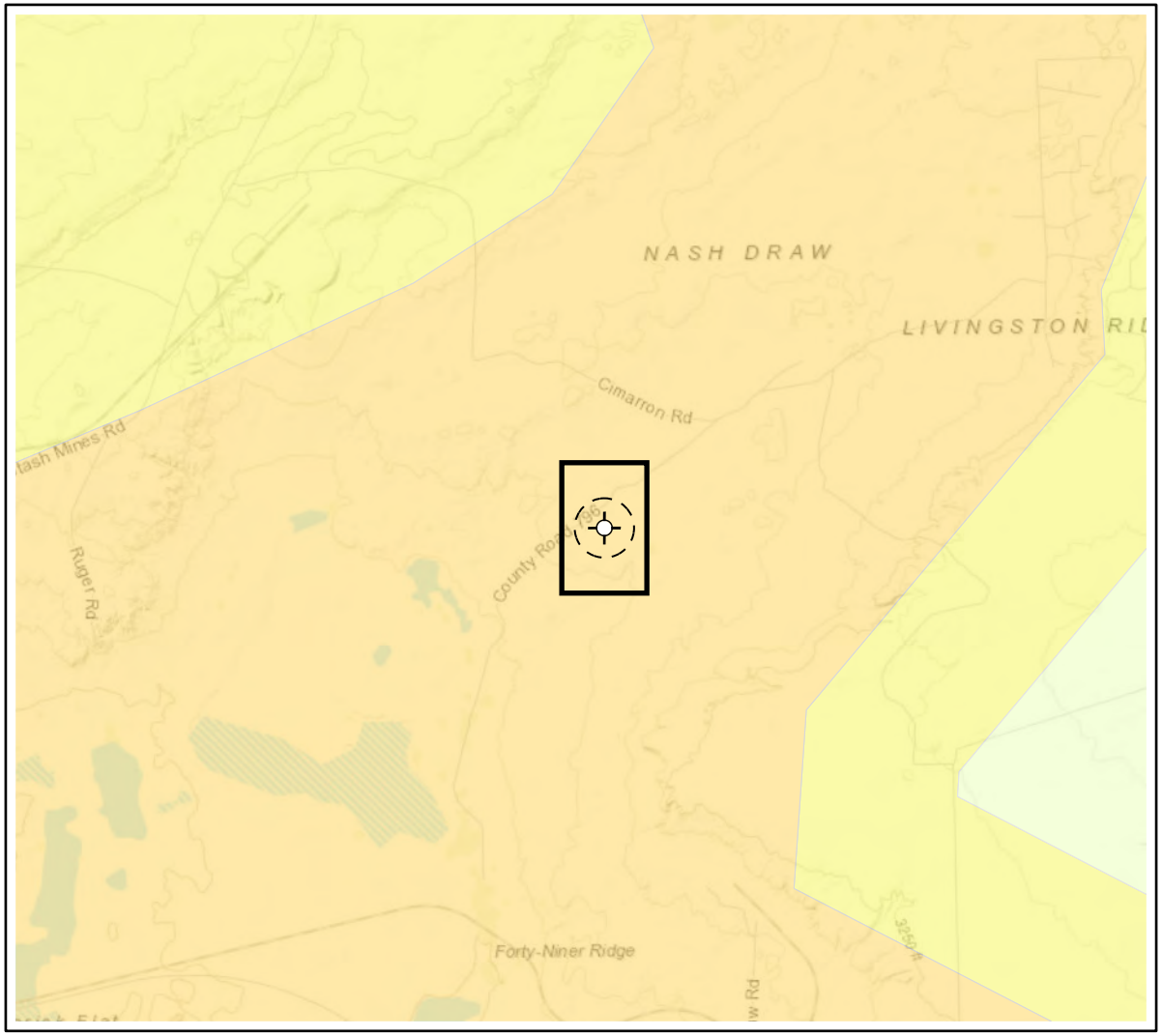
1:36,112

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

EMNRD MMD GIS Coordinator

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



Overview Map
0 0.25 0.5 1 mi

Detail Map
0 150 300 600 ft

Karst Potential
- Critical
- High
- Medium
- Low

Site Location
Site Location Buffer (1000 ft)

VERTEX

Map Center:
Lat/Long
32.3906°,-103.89861°

NAD 1983 UTM Zone 13N
Date: Nov 21/24

N

Karst Potential Map
JRU DI 11 Battery

Figure:
X

XTO ENERGY

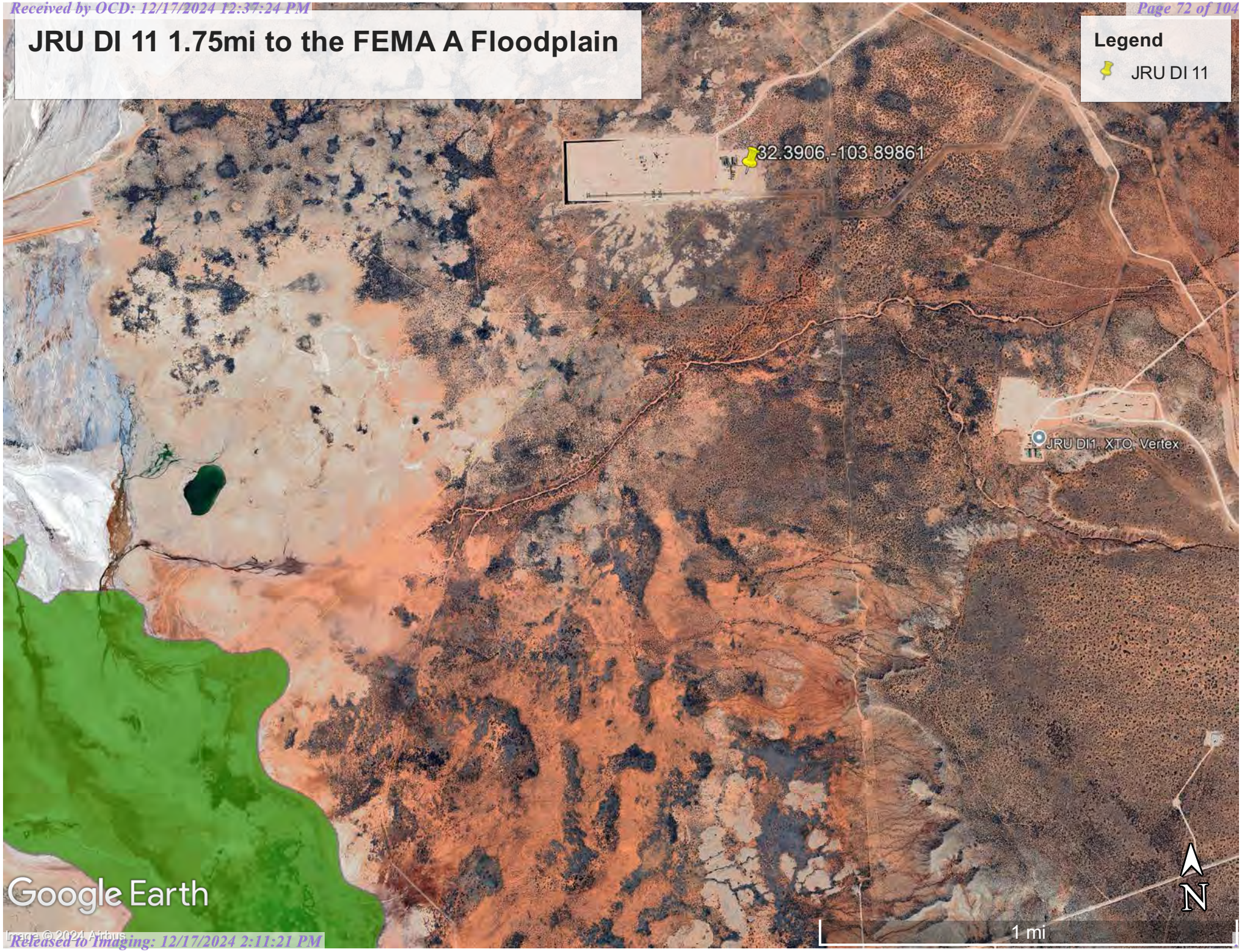
Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

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

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\XTO Energy\2024\24E-04947 - JRU DI 11 Battery\Project\24E-04947.aprx

JRU DI 11 1.75mi to the FEMA A Floodplain



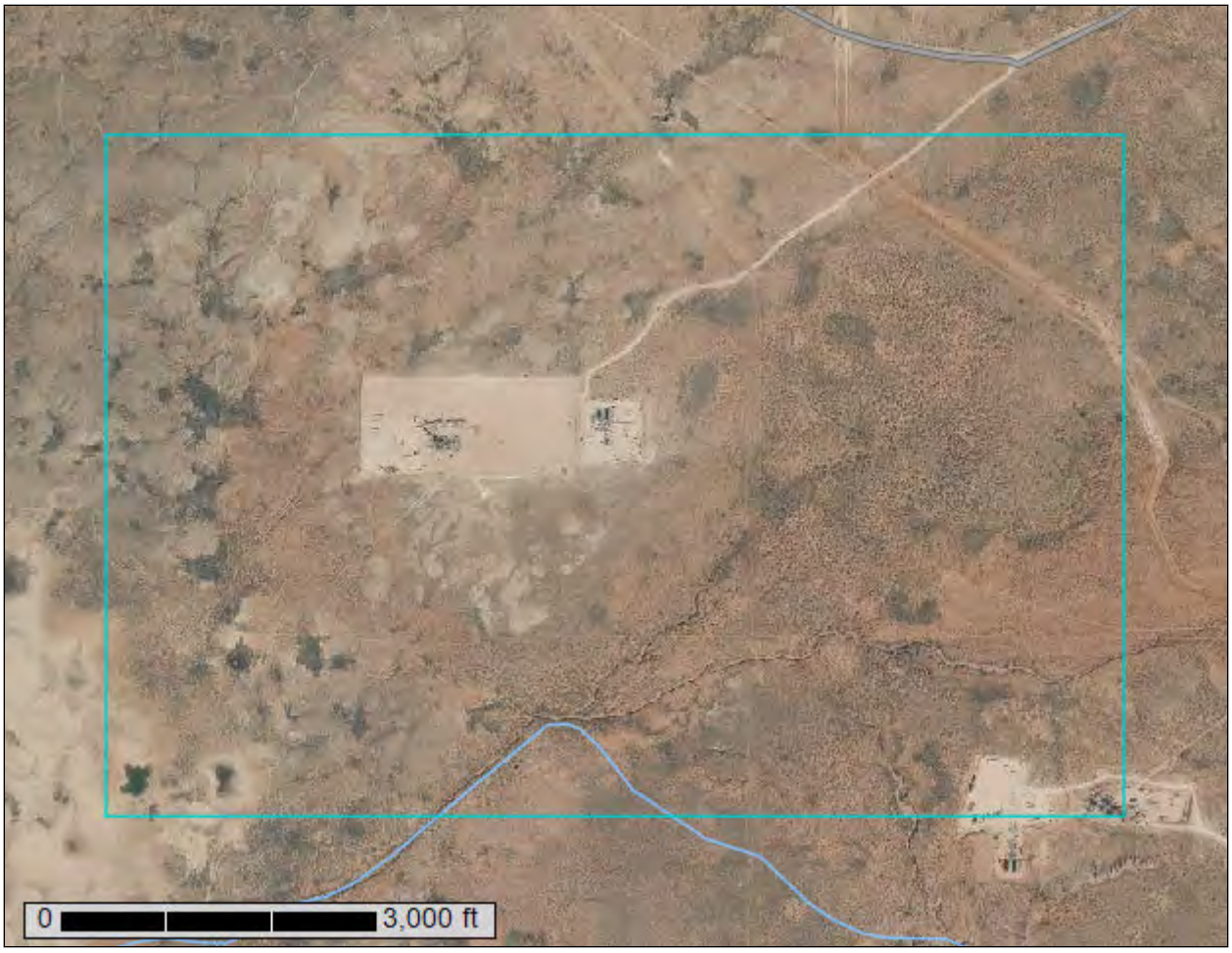
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

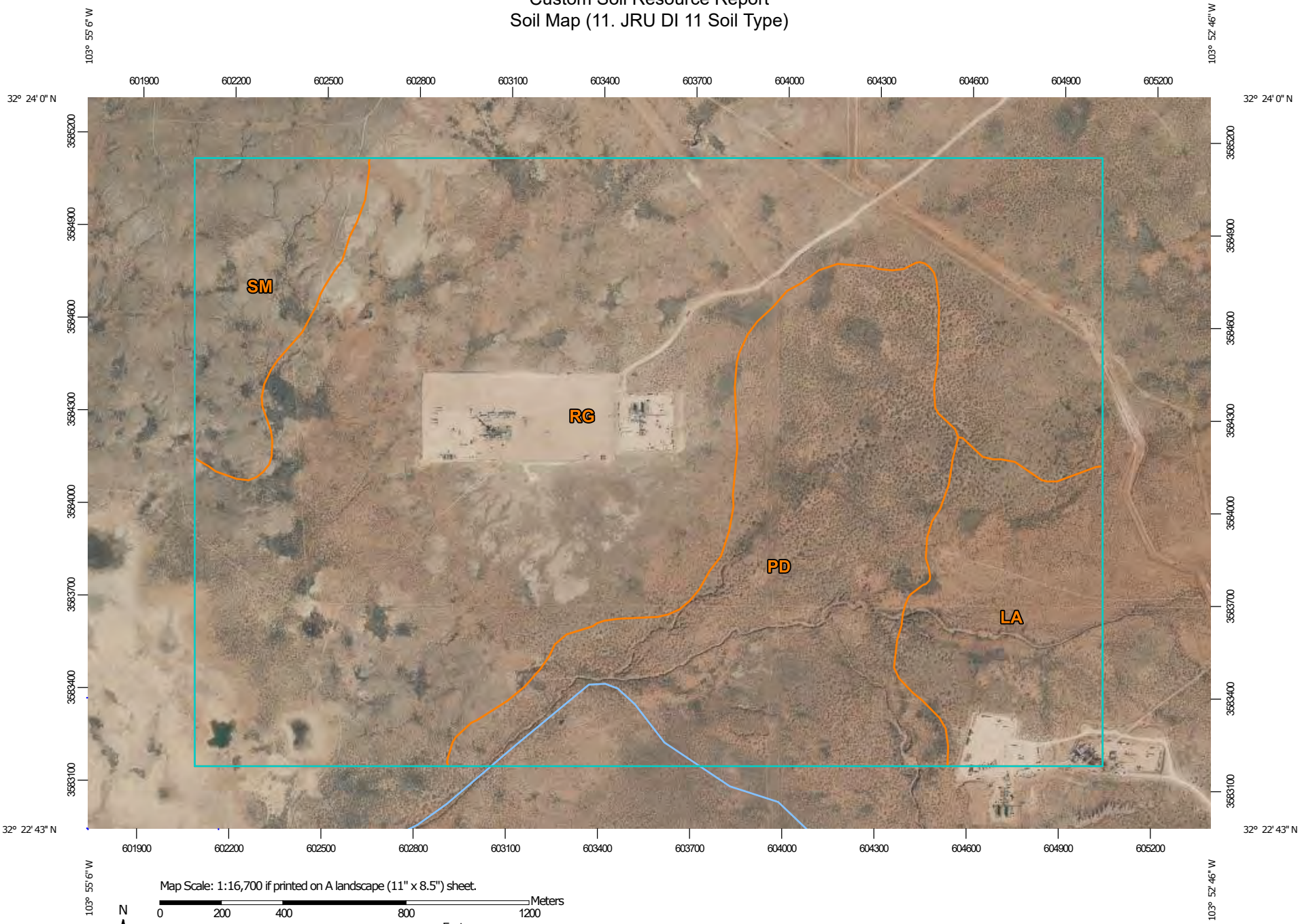
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eddy Area, New Mexico



November 18, 2024

Custom Soil Resource Report
Soil Map (11. JRU DI 11 Soil Type)



MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 20, Sep 3, 2024

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

Date(s) aerial images were photographed: 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 (11. JRU DI 11 Soil Type)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LA	Largo loam, 1 to 5 percent slopes	140.1	9.7%
PD	Pajarito-Dune land complex, 0 to 3 percent slopes	340.6	23.6%
RG	Reeves-Gypsum land complex, 0 to 3 percent slopes	867.3	60.0%
SM	Simona-Bippus complex, 0 to 5 percent slopes	96.3	6.7%
Totals for Area of Interest		**1,444.3**	**100.0%**

Map Unit Descriptions (11. JRU DI 11 Soil Type)

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

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

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

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

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

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

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

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

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

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

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

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

Eddy Area, New Mexico

LA—Largo loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1w4y
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 6 to 14 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Largo

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Calcareous alluvium

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 47 inches: silt loam
H3 - 47 to 65 inches: loam

Properties and qualities

Slope: 1 to 5 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 (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Minor Components

Largo

Percent of map unit: 1 percent
Ecological site: R070BC017NM - Bottomland
Hydric soil rating: No

Pajarito

Percent of map unit: 1 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

PD—Pajarito-Dune land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w55
Elevation: 3,000 to 5,000 feet
Mean annual precipitation: 10 to 15 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 190 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Pajarito and similar soils: 46 percent
Dune land: 45 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pajarito

Setting

Landform: Plains, interdunes, dunes
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 36 inches: fine sandy loam
H3 - 36 to 72 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: 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: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Dune Land

Setting

Landform: Dune fields
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 60 inches: sandy loam

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Largo

Percent of map unit: 4 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

RG—Reeves-Gypsum land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5f
Elevation: 1,250 to 5,000 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 57 to 70 degrees F

Frost-free period: 190 to 235 days
Farmland classification: Not prime farmland

Map Unit Composition

Reeves and similar soils: 55 percent
Gypsum land: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reeves

Setting

Landform: Ridges, plains, hills
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 32 inches: clay loam
H3 - 32 to 60 inches: gypsiferous material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Gypsum, maximum content: 80 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Description of Gypsum Land

Setting

Landform: Ridges, plains, hills
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Largo

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

Reagan

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

Cottonwood

Percent of map unit: 5 percent
Ecological site: R070BC033NM - Salty Bottomland
Hydric soil rating: No

SM—Simona-Bippus complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1w5x
Elevation: 1,800 to 5,000 feet
Mean annual precipitation: 8 to 24 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Simona and similar soils: 55 percent
Bippus and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Simona

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 19 inches: gravelly fine sandy loam
H2 - 19 to 23 inches: indurated

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Description of Bippus

Setting

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

Typical profile

H1 - 0 to 37 inches: silty clay loam
H2 - 37 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 5 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): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R070BC017NM - Bottomland
Hydric soil rating: No

Minor Components

Simona

Percent of map unit: 8 percent
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Bippus

Percent of map unit: 7 percent
Ecological site: R070BC017NM - Bottomland
Hydric soil rating: No

Soil Information for All Uses

Ecological Sites

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

All Ecological Sites — (12. JRU DI 11 Ecological)

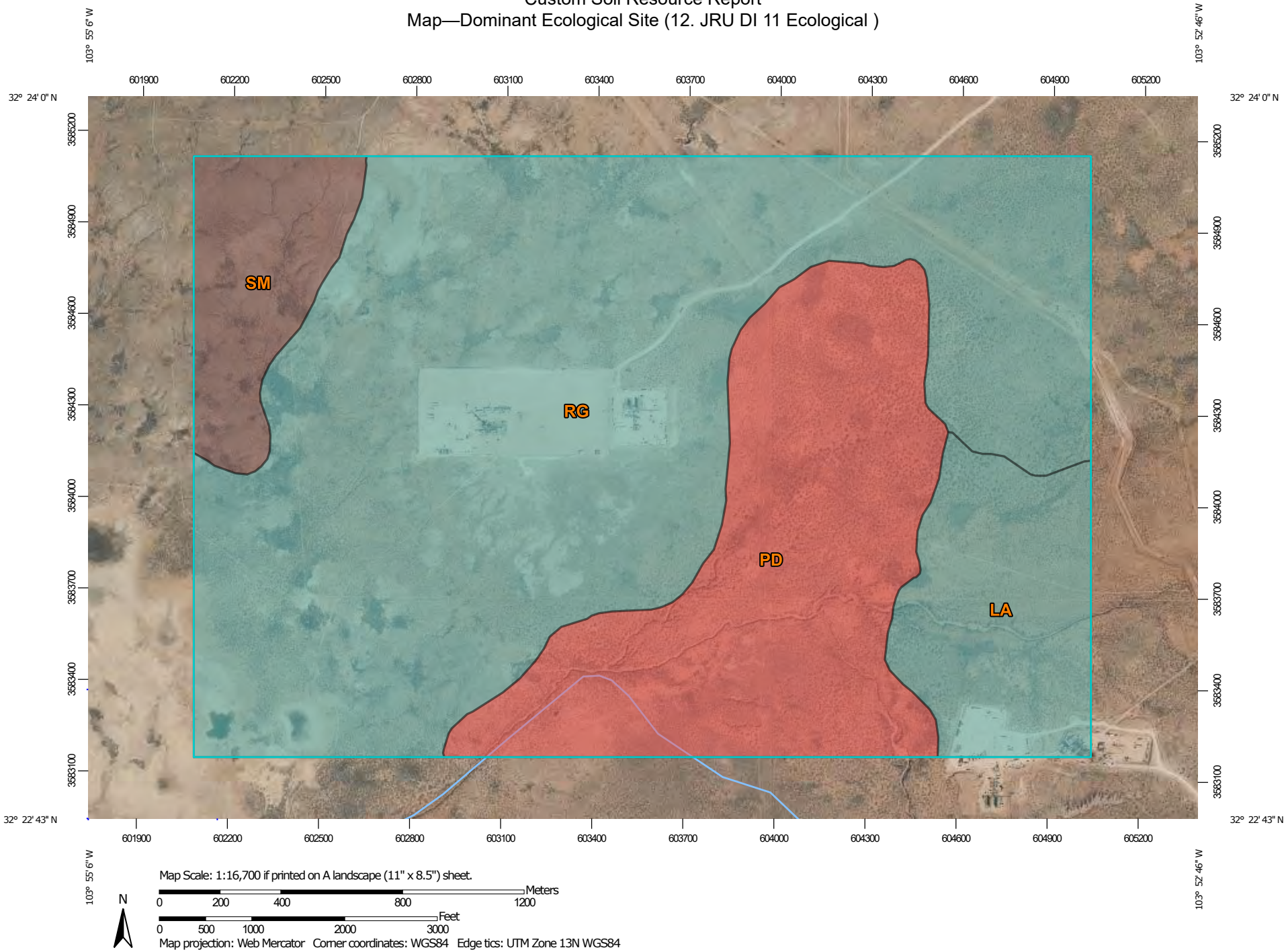
An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and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

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

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

Custom Soil Resource Report

Map—Dominant Ecological Site (12. JRU DI 11 Ecological)



MAP LEGEND

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

Soils

Soil Rating Polygons
- R070BC007NM
- R070BD002NM
- R070BD003NM
- Not rated or not available

Soil Rating Lines
- R070BC007NM
- R070BD002NM
- R070BD003NM
- Not rated or not available

Soil Rating Points
- R070BC007NM
- R070BD002NM
- R070BD003NM
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 20, Sep 3, 2024

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

Date(s) aerial images were photographed: 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.

Table—Ecological Sites by Map Unit Component (12. JRU DI 11 Ecological)

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
LA	Largo loam, 1 to 5 percent slopes	Largo (98%)	R070BC007NM — Loamy	140.1	9.7%
		Largo (1%)	R070BC017NM — Bottomland		
		Pajarito (1%)	R070BD003NM — Loamy Sand		
PD	Pajarito-Dune land complex, 0 to 3 percent slopes	Pajarito (46%)	R070BD003NM — Loamy Sand	340.6	23.6%
		Dune land (45%)	R070BD003NM — Loamy Sand		
		Rock outcrop (5%)			
		Largo (4%)	R070BC007NM — Loamy		
RG	Reeves-Gypsum land complex, 0 to 3 percent slopes	Reeves (55%)	R070BC007NM — Loamy	867.3	60.0%
		Gypsum land (30%)			
		Cottonwood (5%)	R070BC033NM — Salty Bottomland		
		Largo (5%)	R070BC007NM — Loamy		
		Reagan (5%)	R070BC007NM — Loamy		
SM	Simona-Bippus complex, 0 to 5 percent slopes	Simona (55%)	R070BD002NM — Shallow Sandy	96.3	6.7%
		Bippus (30%)	R070BC017NM — Bottomland		
		Simona (8%)	R070BD002NM — Shallow Sandy		
		Bippus (7%)	R070BC017NM — Bottomland		
Totals for Area of Interest				**1,444.3**	**100.0%**

USDA Natural Resources Conservation Service

Ecological site R070BC007NM
Loamy

Accessed: 12/11/2024

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

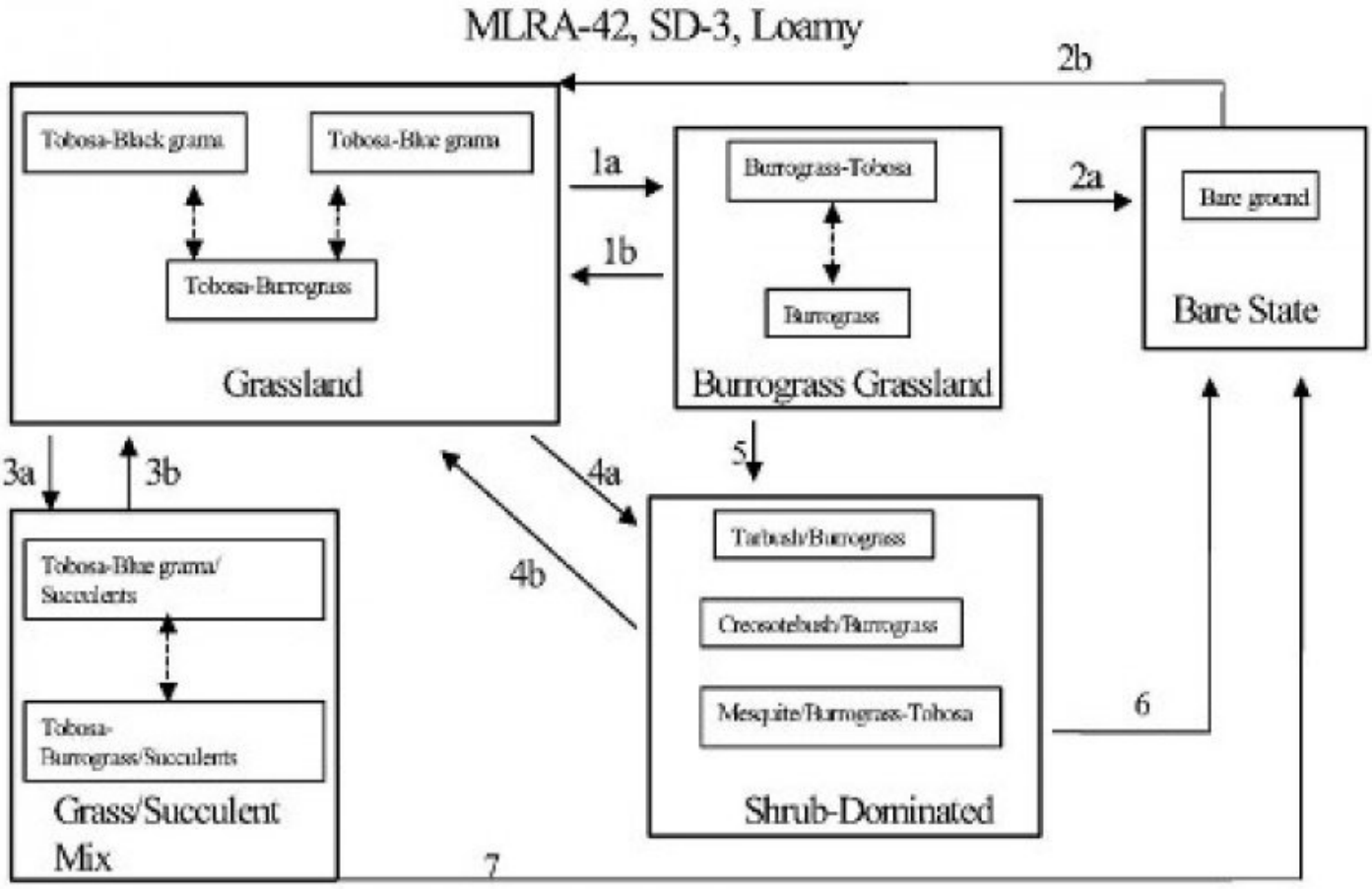
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–12 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–6
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=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

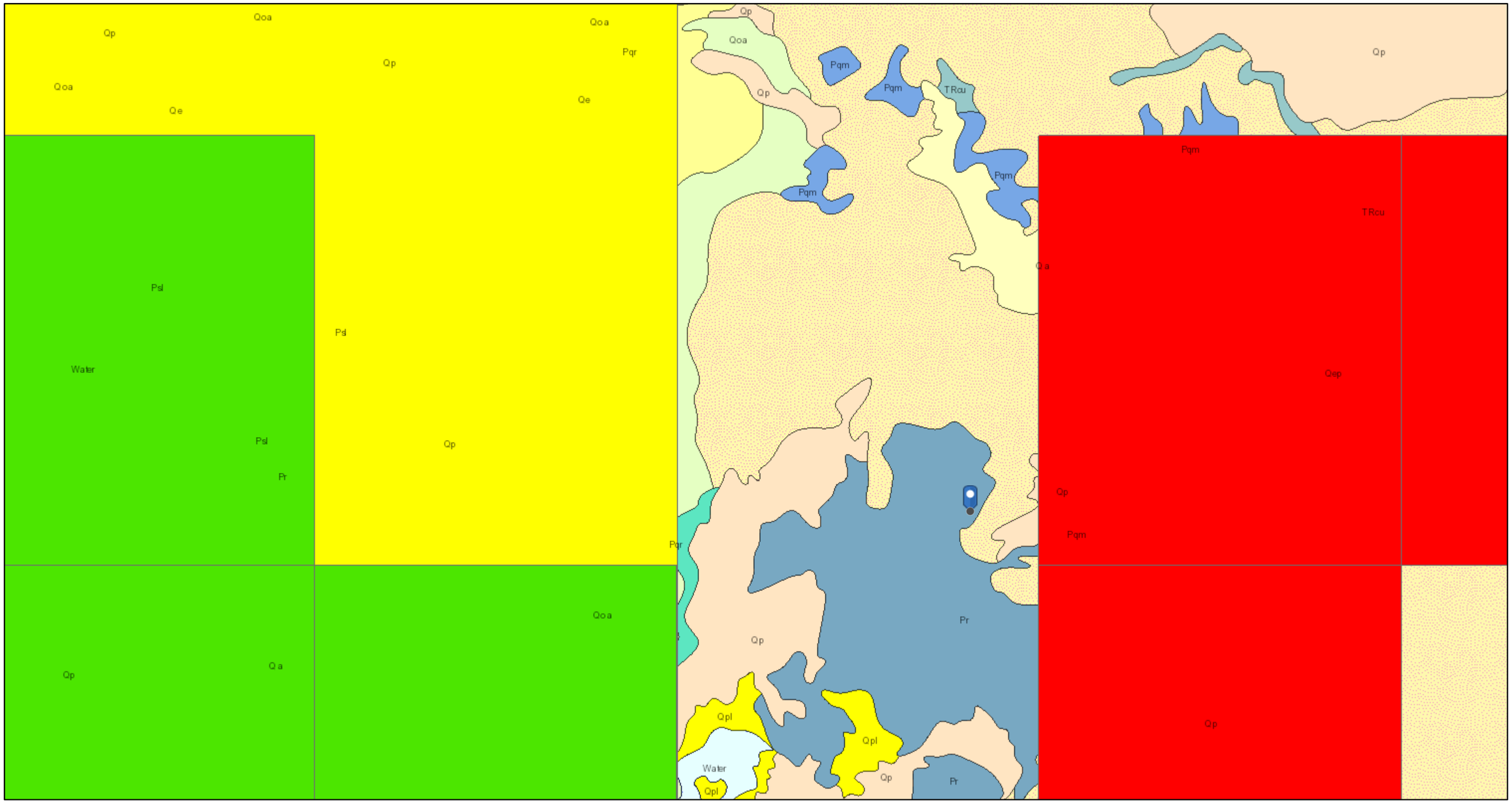
severely limited and shrubs are removed a bare state may result. This transition will depend on amount of grasses or seed remaining, whether site is seeded, or if seeding is successful. Transition to Bare State (7): Removal of succulents and continued overgrazing or drought may cause loss of remaining 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					

13. JRU DI 11 Geology



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Lithologic Units

- Playa——Alluvium and evaporite deposits (Holocene)
- Water——Perenial standing water
- Qa——Alluvium (Holocene to upper Pleistocene)
- Ql——Landslide deposits and colluvium (Holocene to Pleistocene) — Landslide deposits on western flanks of Socorro Mountains not shown for clarity
- Qpl——Lacustrine and playa deposits (Holocene) — Includes associated alluvial and eolian deposits of major lake basins
- Qp——Piedmont alluvial deposits (Holocene to lower Pleistocene)
- Qe——Eolian deposits (Holocene to middle Pleistocene)
- Qeg——Gypsiferous eolian deposits (Holocene to middle Pleistocene)

0 1.5 3 6 mi

0 2.5 5 10 km

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

ArcGIS Web AppBuilder

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

QUESTIONS

Action 412958

QUESTIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 412958
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAPP2431945579**
Incident Name	**NAPP2431945579 JRU DI 11 BATTERY @ 0**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Plan Received**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	JRU DI 11 Battery
Date Release Discovered	11/13/2024
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: Equipment Failure | Pump | Produced Water | Released: 55 BBL | Recovered: 15 BBL | Lost: 40 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)

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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: Colton Brown Title: Environmental Advisor Email: colton.s.brown@exxonmobil.com Date: 12/17/2024

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QUESTIONS (continued)

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QUESTIONS

Site Characterization	
Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
What is the shallowest depth to groundwater beneath the area affected by the release in feet below ground surface (ft bgs)	Between 26 and 50 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Between 500 and 1000 (ft.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between ½ and 1 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Between 1 and 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 1 and 5 (mi.)
Any other fresh water well or spring	Between 1 and 5 (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between ½ and 1 (mi.)
A subsurface mine	Between 1 and 5 (mi.)
An (non-karst) unstable area	Zero feet, overlying, or within area
Categorize the risk of this well / site being in a karst geology	High
A 100-year floodplain	Between 1 and 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan		
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.		
Requesting a remediation plan approval with this submission		Yes
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.		
Have the lateral and vertical extents of contamination been fully delineated		Yes
Was this release entirely contained within a lined containment area		No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)		
Chloride	(EPA 300.0 or SM4500 Cl B)	7520
TPH (GRO+DRO+MRO)	(EPA SW-846 Method 8015M)	0
GRO+DRO	(EPA SW-846 Method 8015M)	0
BTEX	(EPA SW-846 Method 8021B or 8260B)	0
Benzene	(EPA SW-846 Method 8021B or 8260B)	0
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.		
On what estimated date will the remediation commence		01/15/2025
On what date will (or did) the final sampling or liner inspection occur		01/15/2025
On what date will (or was) the remediation complete(d)		04/15/2025
What is the estimated surface area (in square feet) that will be reclaimed		0
What is the estimated volume (in cubic yards) that will be reclaimed		0
What is the estimated surface area (in square feet) that will be remediated		11098
What is the estimated volume (in cubic yards) that will be remediated		1005
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)

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	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Remediation Plan (continued)	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
(Select all answers below that apply.)	
(Ex Situ) Excavation and **off-site** disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for **off-site** disposal	LEA LAND LANDFILL [fEEM0112342028]
OR which OCD approved well (API) will be used for **off-site** disposal	*Not answered.*
OR is the **off-site** disposal site, to be used, out-of-state	*Not answered.*
OR is the **off-site** disposal site, to be used, an NMED facility	*Not answered.*
(Ex Situ) Excavation and **on-site** remediation (i.e. On-Site Land Farms)	*Not answered.*
(In Situ) Soil Vapor Extraction	*Not answered.*
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	*Not answered.*
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	*Not answered.*
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	*Not answered.*
Ground Water Abatement pursuant to 19.15.30 NMAC	*Not answered.*
OTHER (Non-listed remedial process)	*Not answered.*
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
I hereby agree and sign off to the above statement	Name: Colton Brown Title: Environmental Advisor Email: colton.s.brown@exxonmobil.com Date: 12/17/2024
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)

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QUESTIONS

Deferral Requests Only *Only answer the questions in this group if seeking a deferral upon approval this submission. Each of the following items must be confirmed as part of any request for deferral of remediation.*	
Requesting a deferral of the remediation closure due date with the approval of this submission	No

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QUESTIONS (continued)

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	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	***{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	No

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CONDITIONS

Action 412958

CONDITIONS

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	Action Number: 412958
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CONDITIONS

Created By	Condition	Condition Date
bhall	Remediation plan conditionally approved.	12/17/2024
bhall	The entire 11,098 square footage of the release area as depicted on figure 1 must be remediated via excavation and confirmation/final samples must be collected pursuant to 19.15.29 NMAC. Soil samples must meet the most stringent closure criteria. Remediation may need to extended past the proposed extents.	12/17/2024
bhall	Submit a complete and accurate report through the OCD Permitting website by 3/21/2025.	12/17/2024