

Incident ID	nAPP2301628129
District RP	
Facility ID	
Application ID	

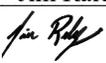
Closure

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

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

- A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- Description of remediation activities

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

Printed Name: Jim Raley Title: Environmental Professional
 Signature:  Date: 3/20/2023
 email: jim.raley@dvn.com Telephone: 575-689-7597

OCD Only

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

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

Closure Approved by:  Date: 8/2/2023
 Printed Name: Robert Hamlet Title: Environmental Specialist - Advanced



March 20, 2023

Vertex Project #: 23E-00466

Spill Closure Report: RDX Federal 17 #016H
Section 17, Township 26 South, Range 30 East
API: 30-015-41089
County: Eddy
Incident Report: nAPP2301628129

Prepared For: **WPX Energy Permian, LLC**
5315 Buena Vista Drive
Carlsbad, New Mexico 88220

New Mexico Oil Conservation Division – District 2 – Artesia

811 South 1st Street
Artesia, New Mexico 88210

WPX Energy Permian, LLC (WPX) retained Vertex Resource Services Inc. (Vertex) to conduct a Spill Assessment for a release of produced water caused by a mechanical seal failure on the water transfer pump at RDX Federal 17 #016H, API 30-015-41089, Incident nAPP2301628129 (hereafter referred to as “RDX”). WPX provided spill notification to the New Mexico Oil Conservation Division (NMOCD) District 2, via submission of an initial C-141 Release Notification (Attachment 1). This letter provides a description of the spill assessment and includes a request for spill closure. The spill area is located at N 32.04892, W -103.9100847.

Background

The site is located approximately 10.63 miles northeast of Angeles, Texas (Google Inc., 2022). The legal location for the site is Section 17, Township 26 South and Range 30 East in Eddy County, New Mexico. The spill area is located on Bureau of Land Management (BLM) property.

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2022) indicates the site’s surface geology is comprised primarily of Qoa - Older alluvial deposits of upland plains and piedmont areas and is characterized as calcic soils and eolian cover sediments of High Plains region (middle to lower Pleistocene). The Natural Resources Conservation Service *Web Soil Survey* characterizes the predominant soil texture on the site as Upton-Simona complex. It tends to be well drained with high runoff and low to moderately high available moisture levels in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2022).

The surrounding landscape is associated with ridges and fans at elevations of 2,000 to 5,700 feet above sea level. The climate is semi-arid, with annual precipitation ranging between 6 to 14 inches. Historically, the plant community has a grassland aspect, dominated by grasses with shrubs. Black grama is dominant with a mixture of creosotebush, mesquite and catclaw mimosa shrubs. Overgrazing and extended drought can reduce grass cover.

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There is no surface water located at RDX. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 New Mexico Administrative Code (NMAC; New Mexico Oil Conservation Division, 2018), is the Pecos River located approximately 4.96 miles southwest of the site (United States Fish and Wildlife Service, 2022). There are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC (New Mexico Oil Conservation Division, 2018).

Incident Description

The spill occurred on January 12, 2023, due to the threads on a 2-inch line failing. The spill was reported on January 13, 2023 and involved the release of approximately 37 barrels (bbl.) of produced water into the lined containment of the tank battery. Approximately 37 bbl. of free fluid was removed during initial spill clean-up. The NMOCD C-141 Report: nAPP2301628129 is included in Attachment 1. The Daily Field Report (DFR) and site photographs are included in Attachment 2.

Closure Criteria Determination

The depth to groundwater was determined using information from the Office of the State Engineers Water Rights Database. A 0.5-mile search radius was used to determine groundwater depth. The closest recorded depth to groundwater was determined to be greater than 125 feet below ground surface (bgs) and 0.95 miles from the site (New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2022a). Documentation used in Closure Criteria Determination research is included in Attachment 3.

WPX Energy Permian, LLC
RDX Federal 17 #016H, nAPP2301628129

2023 Spill Assessment and Closure
March 2023

Closure Criteria Worksheet			
Site Name: RDX Federal 17 #016H			
Spill Coordinates:		X: 32.04892	Y: -103.9100847
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	125	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	26,184	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	24,666	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	34,410	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or	6,811	feet
	ii) Within 1000 feet of any fresh water well or spring	6,811	feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	892	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
10	Within a 100-year Floodplain	Nondetermined	year
11	Soil Type	Upton-Simona complex	
12	Ecological Classification	Shallow Sandy	
13	Geology	Qoa	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	<50'	<50' 51-100' >100'

Based on data included in the closure criteria determination worksheet, the release at RDX would not be subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC and the closure criteria for the site would be

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determined to be associated with the following constituent concentration limits based on depth to groundwater. The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 1.

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 ()

Liner Inspection

On February 27, 2023, Vertex provided 48-hour notification of the liner inspection to NMOCD District 2 and the BLM, as required by Subparagraph (a) of Paragraph (5) of Subsection A 19.15.29.11 NMAC (Attachment 4). On March 2, 2023, Vertex was on-site to identify the area of the spill specified in the initial C-141 Report, conduct an inspection of the lined containment, and verify that the liner was intact and had the ability to contain the release. Visual observation of the liner was completed on all sides and the base of the containment, around equipment and of all seams in the liner. As evidenced in the DFR, liner integrity was confirmed. The DFR and associated photographs of the liner inspection are included in Attachment 2.

Closure Request

Vertex recommends no remediation action to address the release at RDX Federal 17 #016H. The secondary containment liner appeared to be intact and had the ability to contain the release, as shown in the inspection photographs included with the DFR (Attachment 2). There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

Vertex requests that incident nAPP2301628129 be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. WPX certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NMOCD requirements to obtain closure on the open release at RDX Federal 17 #016H.

WPX Energy Permian, LLC
RDX Federal 17 #016H, nAPP2301628129

2023 Spill Assessment and Closure
March 2023

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 575.361.9880 or mpeppin@vertex.ca.



March 20, 2023

Monica Peppin
PROJECT MANAGER, REPORTING

Date

Attachments

- Attachment 1. NMOCD C-141 Release Notification
- Attachment 2. Daily Field Report(s) with Photographs
- Attachment 3. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
- Attachment 4. Required 48-hr Notification of Liner Inspection to Regulatory Agencies

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References

- Google Inc. (2022). *Google Earth Pro (Version 7.3.4) [Software]*. Retrieved from <http://www.google.com/earth>
- New Mexico Bureau of Geology and Mineral Resources. (2022). *Interactive Geologic Map*. Retrieved from <http://geoinfo.nmt.edu>.
- New Mexico Energy, Minerals and Natural Resources Department. (2022). *Coal Mine Resources in New Mexico*. Retrieved from <http://www.emnrd.state.nm.us/MMD/gismapminedata.html>
- New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2022a). *Water Column/Average Depth to Water Report*. Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html>.
- New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2022b). *Point of Diversion Location Report*. Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/wellSurfaceDiversion.html>.
- New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2022c). *Well Log/Meter Information Report*. Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/meterReport.html>
- New Mexico Oil Conservation Division. (2018). *New Mexico Administrative Code – Natural Resources and Wildlife Oil and Gas Releases*. Santa Fe, New Mexico.
- United States Department of Agriculture, Natural Resources Conservation Service. (2022). *Web Soil Survey*. Retrieved from <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.
- United States Department of Homeland Security, FEMA Flood Map Service Center. (2020). Retrieved from <https://msc.fema.gov/portal/search?AddressQuery=malaga%20new%20mexico#searchresultsanchor>.
- United States Fish and Wildlife Service. (2022). *National Wetlands Inventory*. Retrieved from <https://www.fws.gov/wetlands/data/Mapper.html>.

WPX Energy Permian, LLC
RDX Federal 17 #016H, nAPP2301628129

2023 Spill Assessment and Closure
March 2023

Limitations

This report has been prepared for the sole benefit of WPX Energy Permian, LLC. This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division and Bureau of Land Management, without the express written consent of Vertex Resource Services Inc. (Vertex) and WPX Energy Permian, LLC. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

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

ATTACHMENT 1

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

State of New Mexico
Energy Minerals and Natural
Resources Department

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

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

Incident ID	nAPP2301628129
District RP	
Facility ID	
Application ID	

Responsible Party

Responsible Party WPX Energy Permain, LLC	OGRID 246289
Contact Name Jim Raley	Contact Telephone 575-689-7597
Contact email Jim.Raley@dvn.com	Incident # (assigned by OCD) nAPP2301628129
Contact mailing address 5315 Buena Vista Drive, Carlsbad, NM 88220	

Location of Release Source

Latitude 32.04892 Longitude -103.9100847
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: RDX FEDERAL 17 #016H	Site Type Oil Well
Date Release Discovered: 01/12/2023	API# (if applicable) 30-015-41089

Unit Letter	Section	Township	Range	County
D	17	26S	30E	Eddy

Surface Owner: State Federal Tribal Private (Name: _____)

Nature and Volume of Release

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

<input type="checkbox"/> Crude Oil	Volume Released (bbls) 0	Volume Recovered (bbls) 0
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls) 37	Volume Recovered (bbls) 37
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Threads on 2" line failed allowing the release of 37 bbls produced water to lined secondary containment. Fluids fully recovered with vac truck.

Volume estimate = Recovered volume from lined secondary containment.

State of New Mexico
Oil Conservation Division

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Was this a major release as defined by 19.15.29.7(A) NMAC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? Volume exceeded 25 bbls.
---	--

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
 Email to Mike Bratcher and Rosa Romero on 1/13/2023.

Initial Response

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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input checked="" type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.
--

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

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

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

Printed Name: Jim Raley Title: Environmental Professional

Signature:  Date: 1/16/2023

email: jim.raley@dvn.com Telephone: 575-689-7597

OCD Only

Received by: _____ Date: _____

Incident ID	nAPP2301628129
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Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	125 (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

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

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- Field data
- Data table of soil contaminant concentration data
- Depth to water determination
- Determination of water sources and significant watercourses within 1/2-mile of the lateral extents of the release
- Boring or excavation logs
- Photographs including date and GIS information
- Topographic/Aerial maps
- Laboratory data including chain of custody

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

State of New Mexico
Oil Conservation Division

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Signature:  Date: 3/20/2023

email: jim.raley@dvn.com Telephone: 575-689-7597

OCD Only

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

- A scaled site and sampling diagram as described in 19.15.29.11 NMAC
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Printed Name: Jim Raley Title: Environmental Professional
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OCD Only

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

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Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

ATTACHMENT 2



Daily Site Visit Report

Client:	WPX Energy	Inspection Date:	3/2/2023
Site Location Name:	RDX FEDERAL 17 #016H	Report Run Date:	3/2/2023 9:45 PM
Client Contact Name:	Jim Raley	API #:	
Client Contact Phone #:	(575) 748-0176	Project Owner:	
Unique Project ID		Project Manager:	
Project Reference #			

Summary of Times

Arrived at Site	3/2/2023 11:45 AM
Departed Site	3/2/2023 12:03 PM



Daily Site Visit Report

Field Notes

11:45 Arrived on site and filled out safety paperwork.

11:46 Conducted liner inspection for RDX Federal 17-16.

11:59 Liner inspection has been completed. Liner is in good condition and is well maintained. There were no signs of previous or potential fluid breaches.

Next Steps & Recommendations

1



Daily Site Visit Report

Site Photos

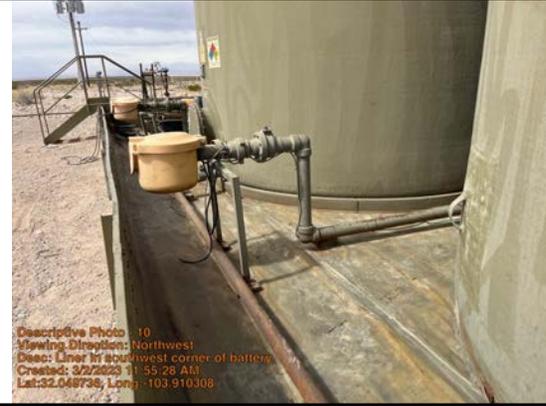
Viewing Direction: Northeast



Descriptive Photo - 9
Viewing Direction: Northeast
Desc: Liner
Created: 3/2/2023 11:50:38 AM
Lat:32.048729, Long:-103.910308

Liner in good condition at northwest corner of battery.

Viewing Direction: Northwest



Descriptive Photo - 10
Viewing Direction: Northwest
Desc: Liner in southwest corner of battery
Created: 3/2/2023 11:55:28 AM
Lat:32.048736, Long:-103.910308

Liner in southwest corner of battery.

Viewing Direction: East



Descriptive Photo - 5
Viewing Direction: East
Desc: Liner
Created: 3/2/2023 11:51:09 AM
Lat:32.048729, Long:-103.910308

Liner in good condition looking into center of battery from the west side.

Viewing Direction: Southeast



Descriptive Photo - 3
Viewing Direction: Southeast
Desc: Liner in good condition at northwest corner.
Created: 3/2/2023 12:02:28 PM
Lat:32.048729, Long:-103.910144

Liner in good condition in western center of battery.



Daily Site Visit Report

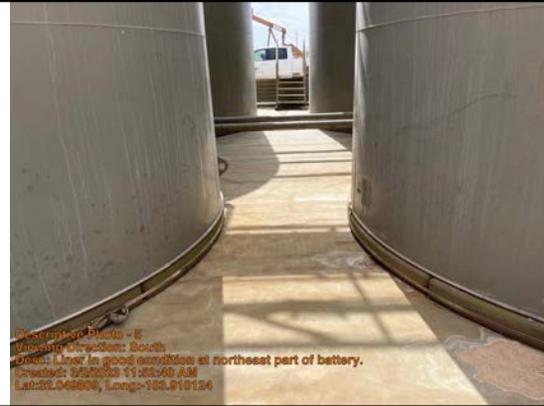
Viewing Direction: South



Descriptive Photo - 6
Viewing Direction: South
Desc: Liner in good condition at northern part of battery.
Created: 3/2/2023 11:51:59 AM
Lat:32.046832, Long:-103.910242

Liner in good condition at northern part of battery.

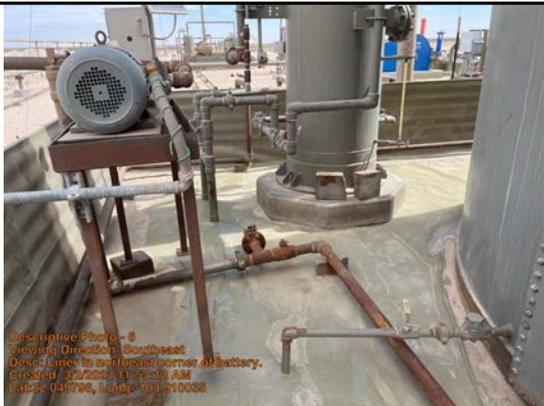
Viewing Direction: South



Descriptive Photo - 6
Viewing Direction: South
Desc: Liner in good condition at northeast part of battery.
Created: 3/2/2023 11:52:40 AM
Lat:32.046836, Long:-103.910124

Liner in good condition at northeast part of battery.

Viewing Direction: Southeast



Descriptive Photo - 8
Viewing Direction: Southeast
Desc: Liner in northeast corner of battery.
Created: 3/2/2023 11:54:11 AM
Lat:32.046766, Long:-103.910008

Liner in northeast corner of battery.

Viewing Direction: West

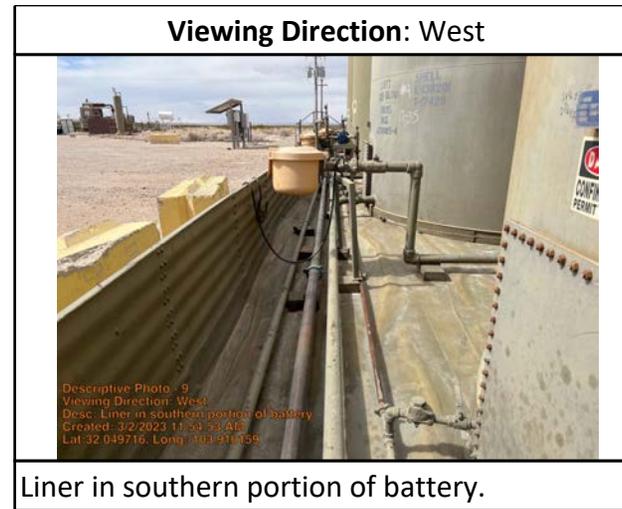
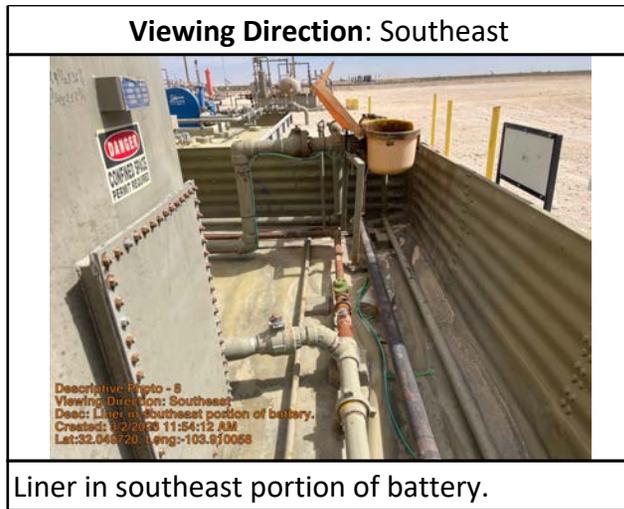


Descriptive Photo - 7
Viewing Direction: West
Desc: Liner in center of battery.
Created: 3/2/2023 11:53:58 AM
Lat:32.046773, Long:-103.910008

Liner in center of battery.



Daily Site Visit Report



Daily Site Visit Report



Daily Site Visit Signature

Inspector: Hunter Klein

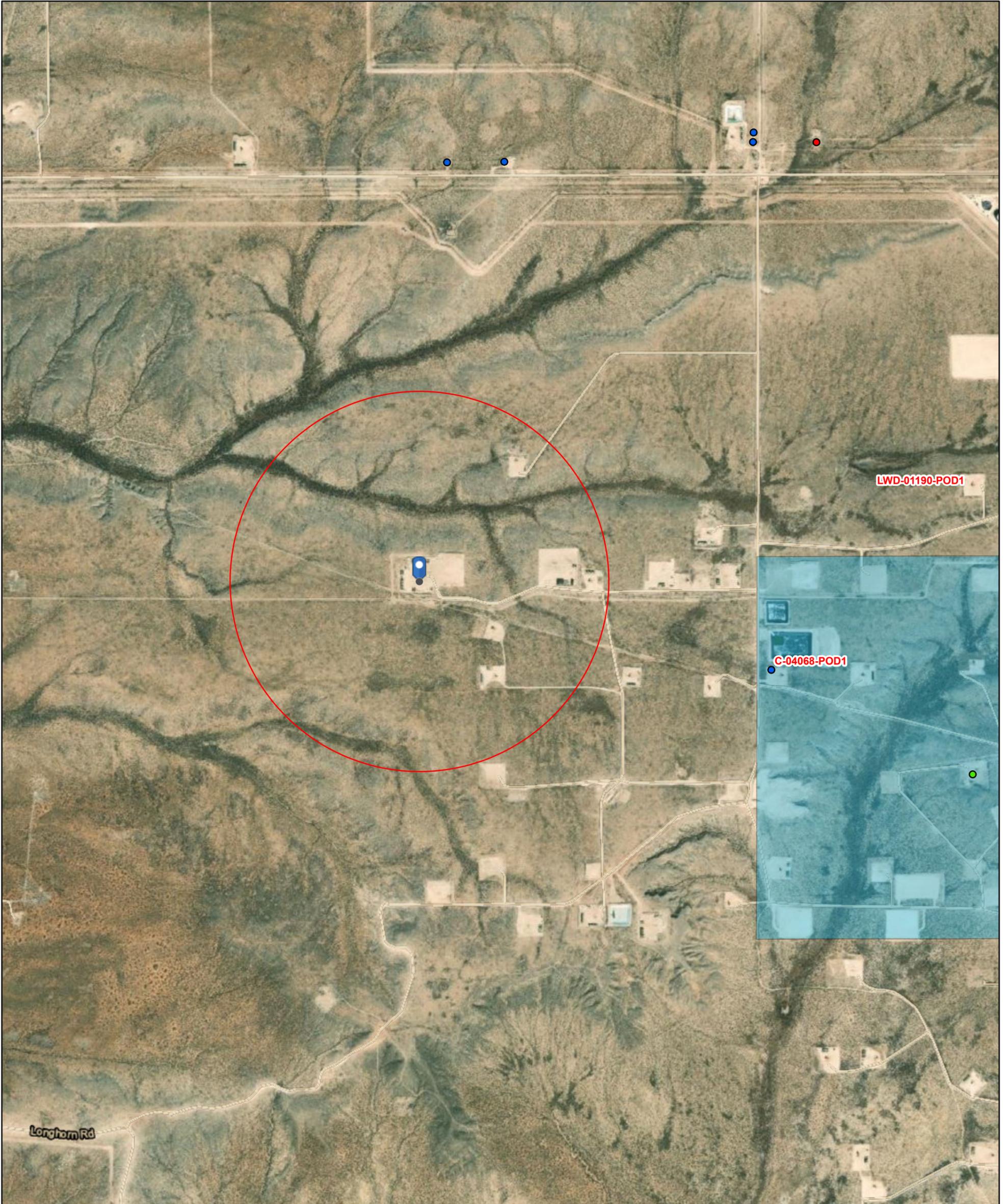
Signature:

A handwritten signature in black ink, appearing to read 'Hunter Klein', written over a thin horizontal line.

Signature

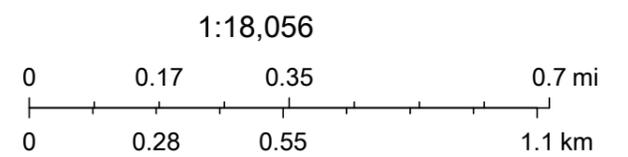
ATTACHMENT 3

RDX 17 Federal #016H



1/26/2023, 2:25:37 PM

- GIS WATERS PODs
- Active
 - Pending
 - Plugged
- OSE District Boundary
- New Mexico State Trust Lands
 - Both Estates
 - SiteBoundaries



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WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE OF NEW MEXICO
ROOSTER, NEW MEXICO

2023 MAY 17 PM 1:58

1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) C-4068 POD1				OSE FILE NUMBER(S) C-4068					
	WELL OWNER NAME(S) RKI Exploration and Production, LLC				PHONE (OPTIONAL)					
	WELL OWNER MAILING ADDRESS 3500 One Williams Center MD 35,				CITY Tulsa		STATE OK		ZIP 74172	
	WELL LOCATION (FROM GPS)	DEGREES		MINUTES		SECONDS		* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84		
		LATITUDE		LONGITUDE		N				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE NW/4SW/4NW/4 Section 16, Township 26S, Range 30 E, N.M.P.M.										

2. DRILLING & CASING INFORMATION	LICENSE NUMBER 1249		NAME OF LICENSED DRILLER Jackie D. Atkins				NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.							
	DRILLING STARTED 5/11/2017		DRILLING ENDED 5/12/2017		DEPTH OF COMPLETED WELL (FT) n/a		BORE HOLE DEPTH (FT) 125		DEPTH WATER FIRST ENCOUNTERED (FT) none encountered					
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)								STATIC WATER LEVEL IN COMPLETED WELL (FT) n/a					
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:													
	DRILLING METHOD: <input type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> OTHER - SPECIFY: hollow stem auger with air rotary													
	DEPTH (feet bgl)		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)	
	FROM	TO												
	0	125	±6.625		n/a		n/a		n/a		n/a		n/a	

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

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version: 10/29/15)

FILE NUMBER	C-4068	POD NUMBER	1	TRN NUMBER	606777
LOCATION	26S-30E-16-1-3-1			EXPL	PAGE 1 OF 2

Tom Blaine, P.E.
State Engineer



Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

**STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER**

Trn Nbr: 606777
File Nbr: C 04068
Well File Nbr: C 04068 POD1

Jun. 12, 2017

JUSTIN BARMORE
RKI EXPLORATION AND PRODUCTION LLC
3500 ONE WILLIAMS CENTER MD 35
TULSA, OK 74172

Greetings:

The above numbered permit was issued in your name on 05/08/2017.

The Well Record was received in this office on 05/17/2017, stating that it had been completed on 05/12/2017, and was a dry well. The well is to be plugged or capped or otherwise maintained in a manner satisfactory to the State Engineer.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 05/15/2018.

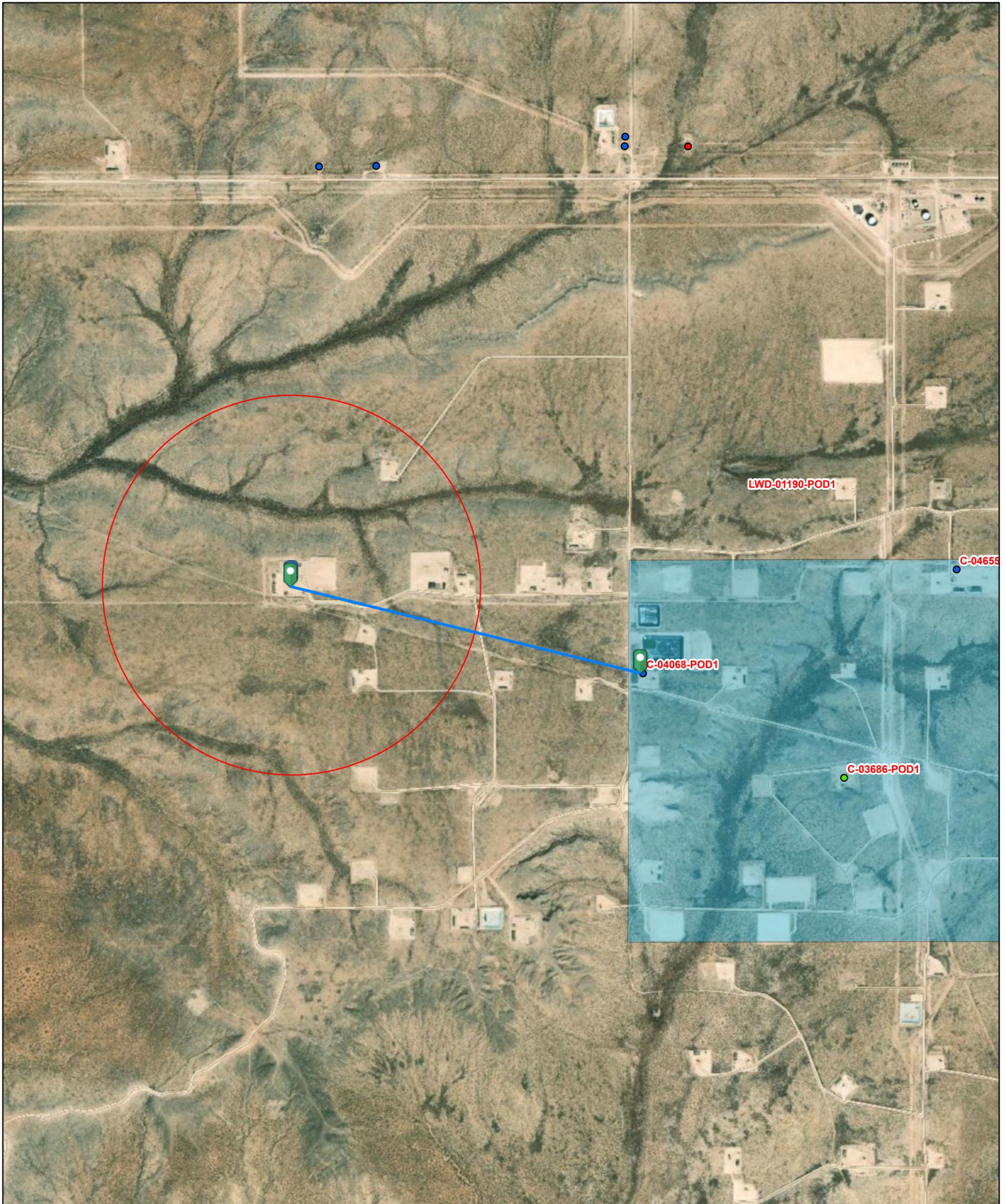
If you have any questions, please feel free to contact us.

Sincerely,


Deborah Dunaway
(575) 622-6521

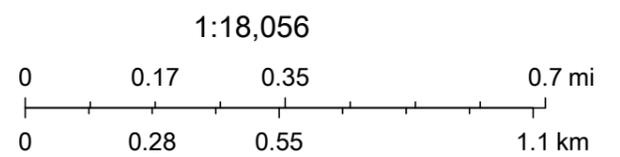
drywell

RDX 17 Federal #016H



1/26/2023, 2:44:32 PM

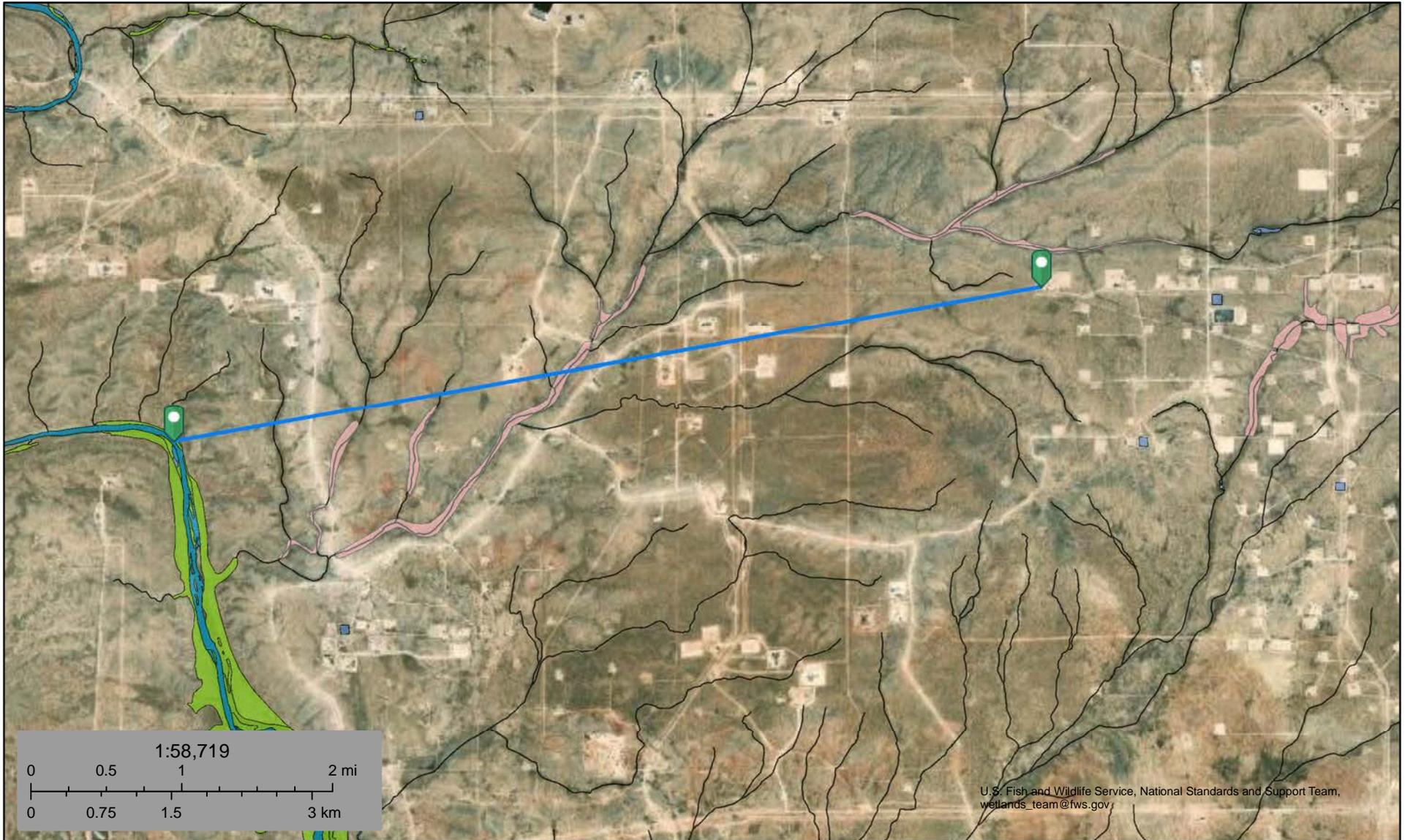
- Override 1
- OSE District Boundary
- GIS WATERS PODs
- Active
- Pending
- Plugged
- Both Estates
- SiteBoundaries



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RDX 17 Federal #016H



January 26, 2023

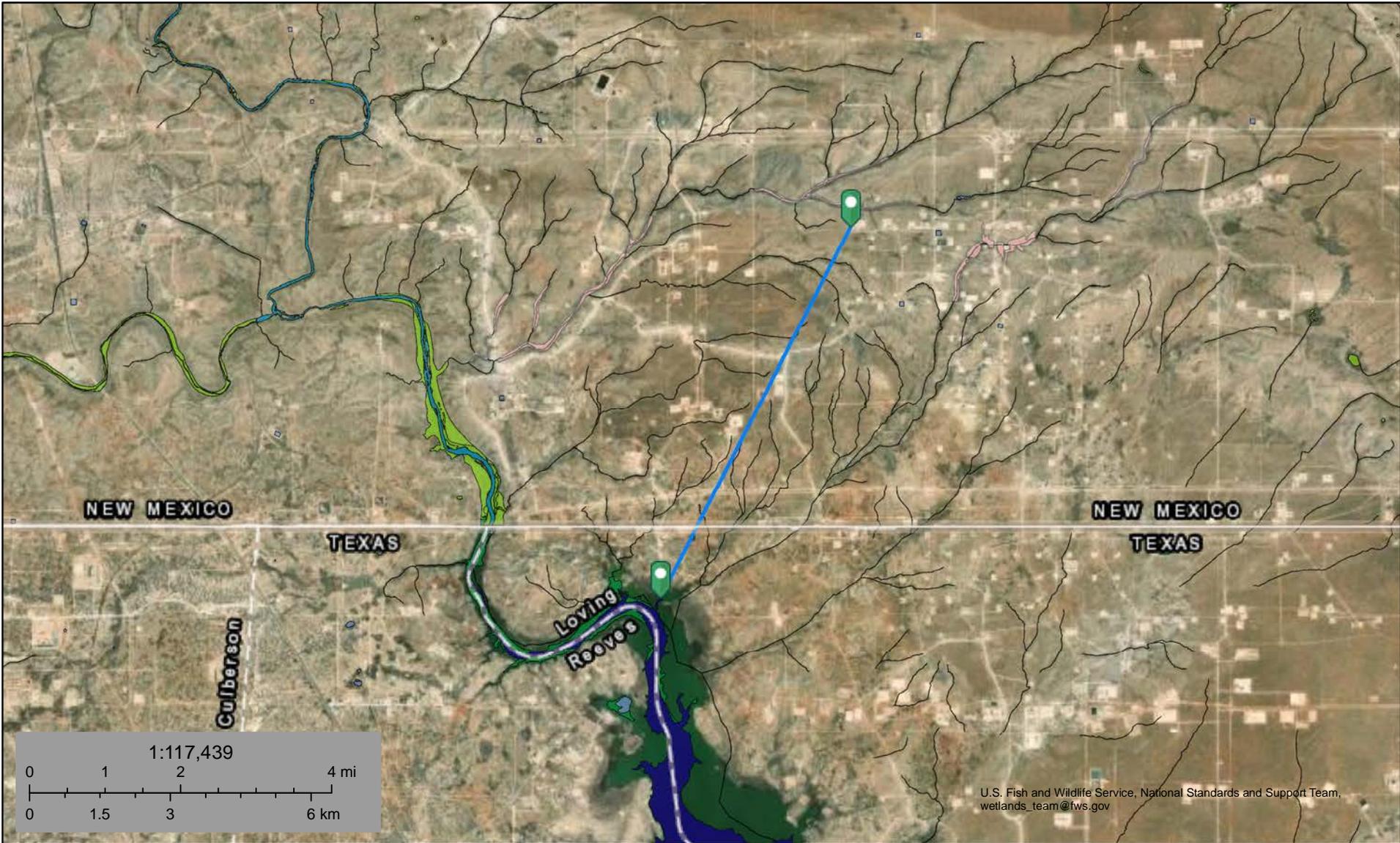
Wetlands

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

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.



RDX 17 Federal #016H



January 26, 2023

Wetlands

- Estuarine and Marine Deepwater
- Freshwater Emergent Wetland
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- Freshwater Pond
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RDX 17 Federal #016H

Nearest Residence: 6.52 miles (34,410 feet)

Legend

 RDX 17 Federal #016H

RDX 17 Federal #016H



Residence



Pecos River

726

NEW MEXICO

Red Bluff Landfill

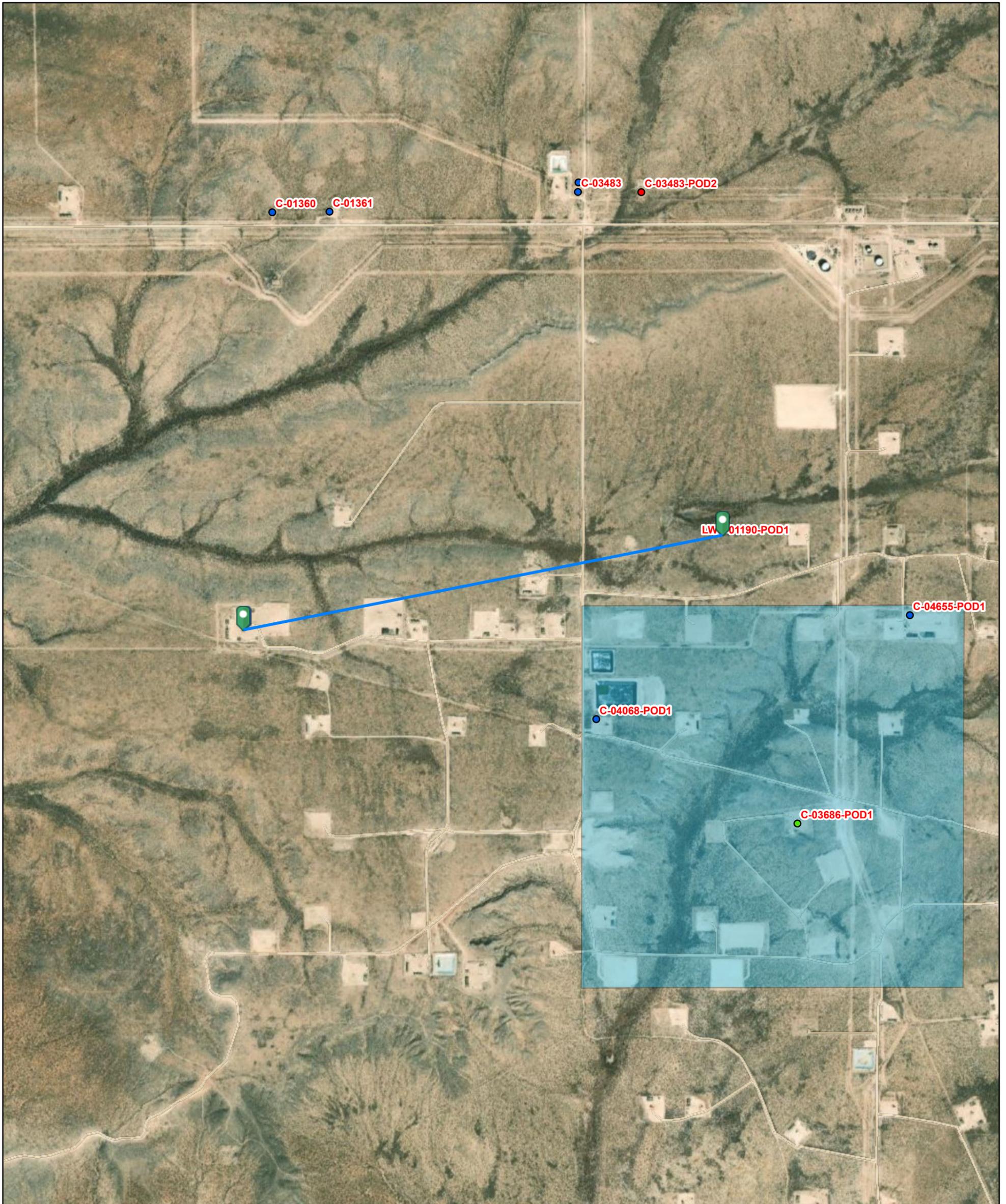
285

Google Earth



3 mi

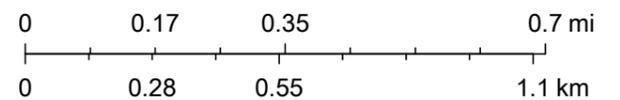
RDX 17 Federal #016H



1/26/2023, 3:36:59 PM

- Override 1
- OSE District Boundary
- GIS WATERS PODs
- Active
- Pending
- Plugged
- Both Estates
- SiteBoundaries

1:18,056



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New Mexico Office of the State Engineer

Water Right Summary



[get image list](#)

WR File Number: LWD 01190 **Subbasin:** CUB **Cross Reference:** LWD-C-9
Primary Purpose: PLS NON 72-12-1 LIVESTOCK WATERING
Primary Status: DCL DECLARATION
Total Acres: 2.9 **Subfile:** - **Header:** -
Total Diversion: 8.1 **Cause/Case:** -
Owner: BUCK & LARUE JACKSON TRUST

Documents on File

Trn #	Doc	File/Act	Status		Transaction Desc.	From/	Acres	Diversion	Consumptive
			1	2		To			
631030	DCL	1992-03-16	DCL	PRC	LWD-C-9	T	2.9	8.1	

Current Points of Diversion

(NAD83 UTM in meters)

POD Number	Well Tag	Source	Q		X	Y	Other Location Desc
			64Q16Q4Sec	Tws Rng			
LWD 01190 POD1			1 4 3 09	26S 30E	604838	3546802*	

An () after northing value indicates UTM location was derived from PLSS - see Help

Priority Summary

Priority	Status	Acres	Diversion	Pod Number
12/31/1906	DCL	2.9	8.1	LWD 01190 POD1

Place of Use

Q	Q	Q16 Q4Sec		Tws Rng	Acres	Diversion	CU	Use	Priority	Status	Other Location Desc
256	64	1 4	3 09	26S 30E	2.9	8.1		PLS	12/31/1906	DCL	

Source

Acres	Diversion	CU	Use	Priority	Source Description
2.9	8.1		PLS	12/31/1906	SW

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

1/26/23 3:32 PM

WATER RIGHT SUMMARY

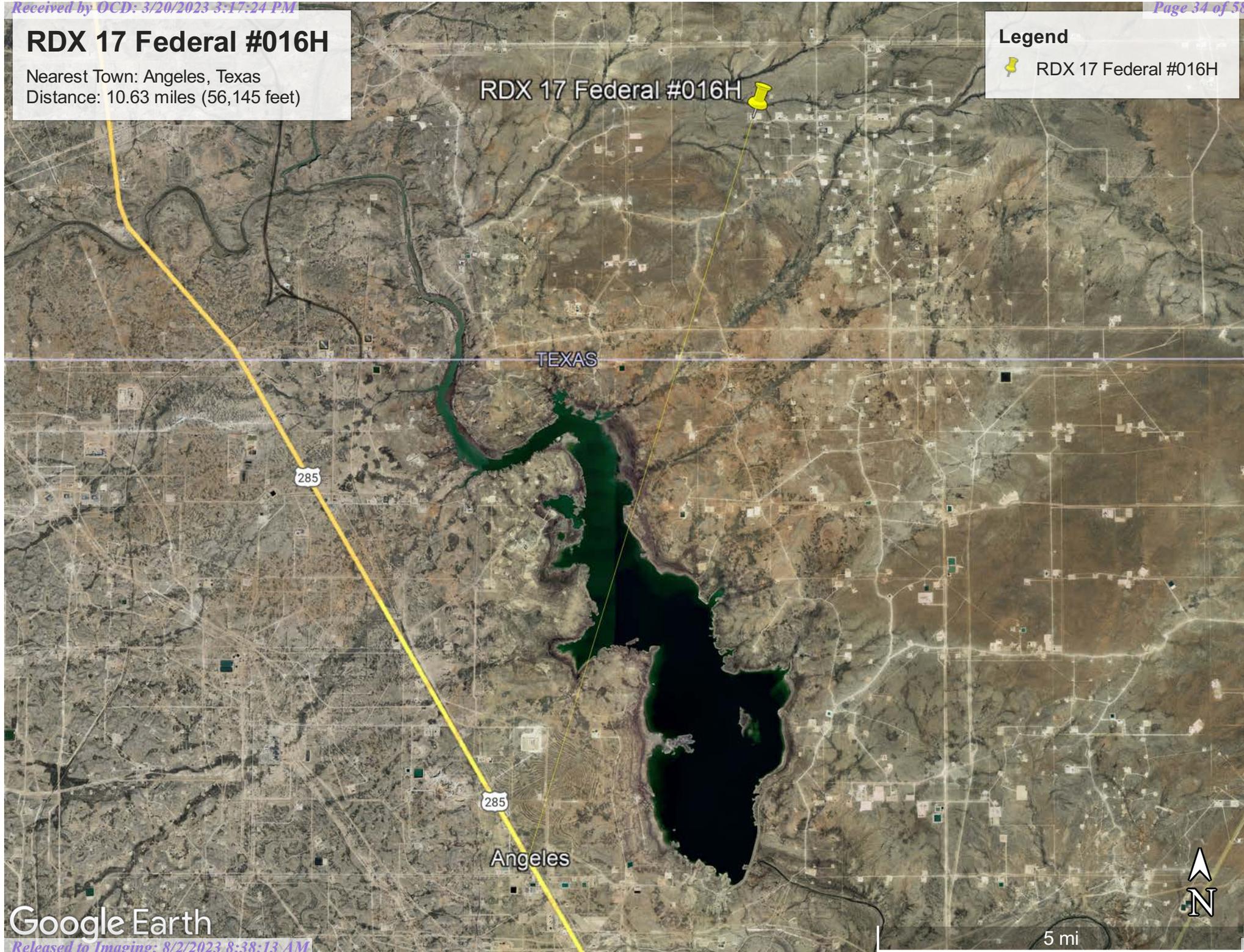
RDX 17 Federal #016H

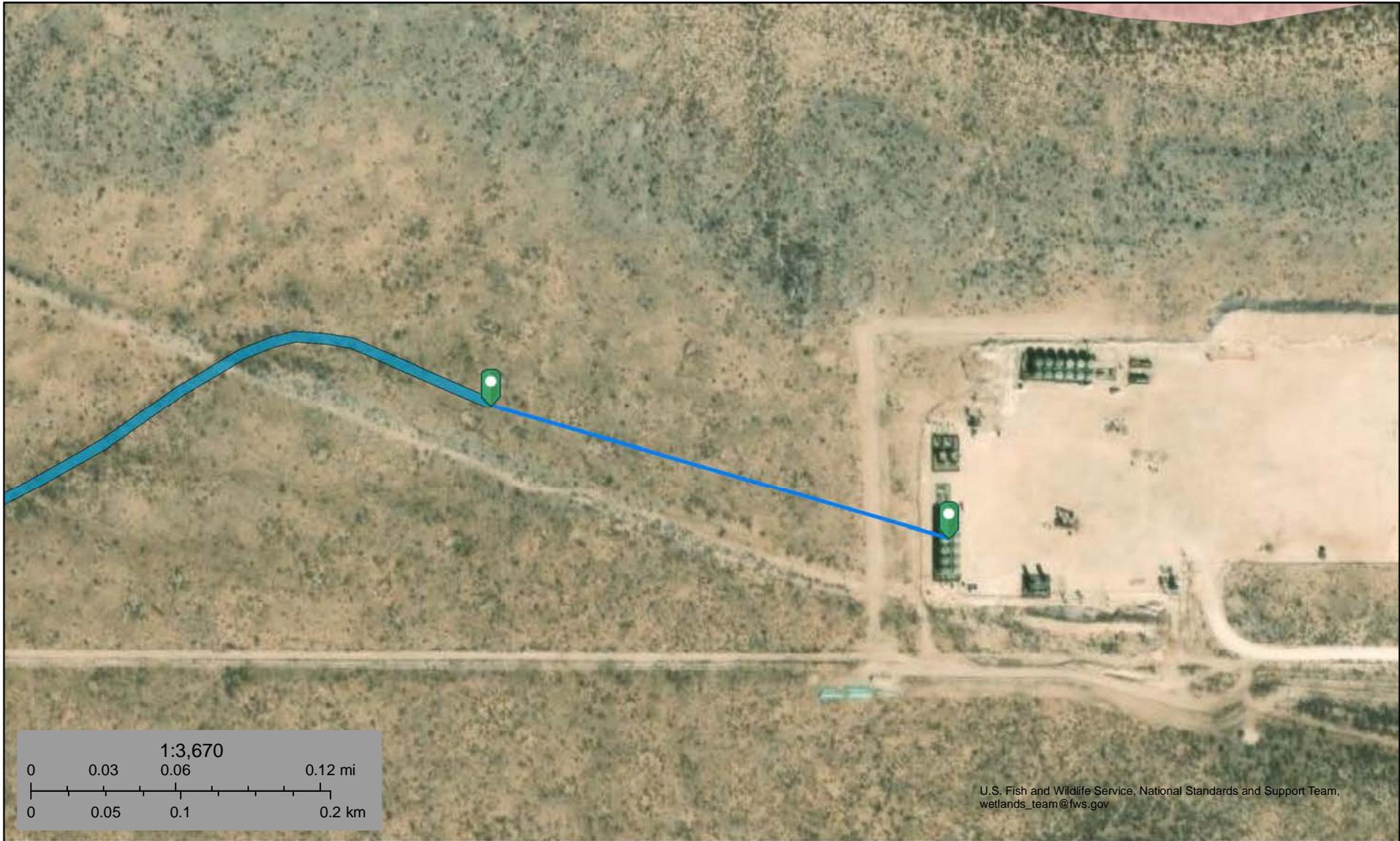
Nearest Town: Angeles, Texas
Distance: 10.63 miles (56,145 feet)

Legend

 RDX 17 Federal #016H

RDX 17 Federal #016H 





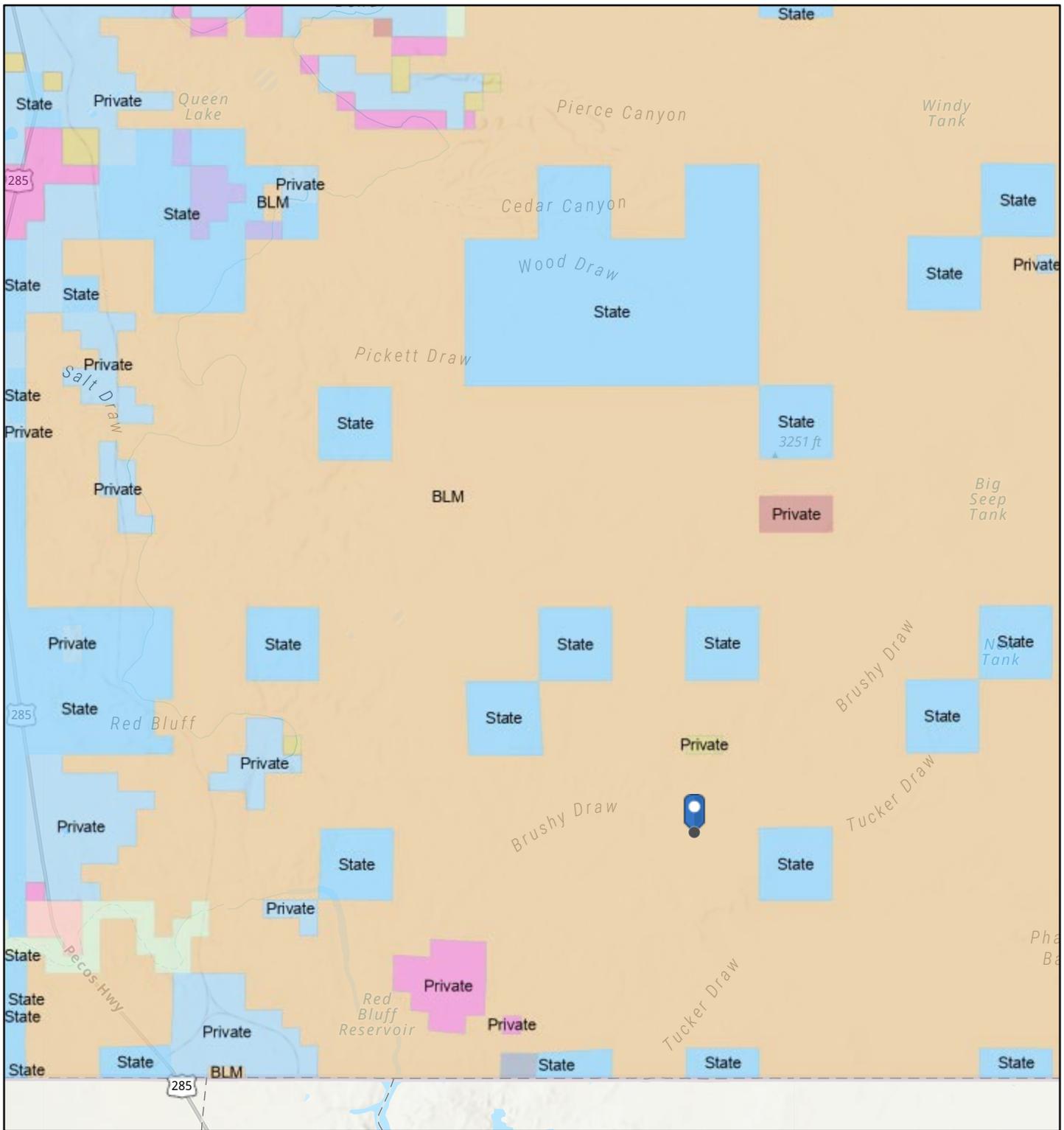
January 26, 2023

Wetlands

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

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RDX 17 Federal #016H



1/26/2023, 1:45:34 PM

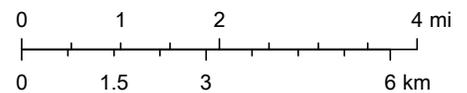
1:144,448

Mineral Ownership

- A-All minerals are owned by U.S.
- N-No minerals are owned by the U.S.
- O-Only oil and gas are owned by the U.S.
- T-Other minerals are owned by the U.S.

Land Ownership

- BLM
- P
- S



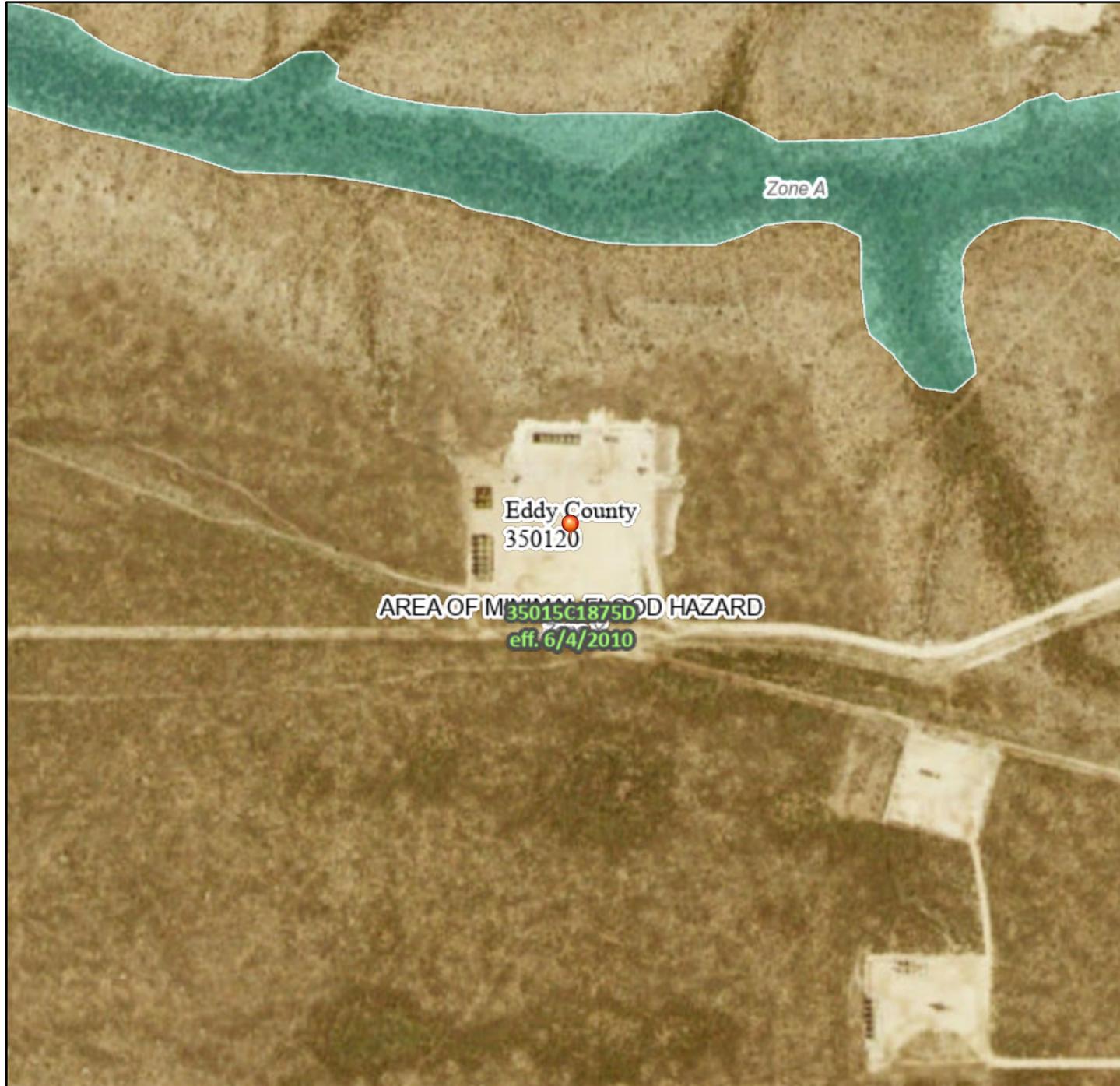
U.S. BLM, Esri, NASA, NGA, USGS, NM Coal Mine Reclamation Program, NM EMNRD, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

EMNRD MMD GIS Coordinator

National Flood Hazard Layer FIRMette



103°54'55"W 32°3'11"N



Legend

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

- | | | |
|------------------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | | 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 <i>Zone X</i> |
| | | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| | | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard <i>Zone D</i> |
| | | 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 |
| MAP PANELS | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



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

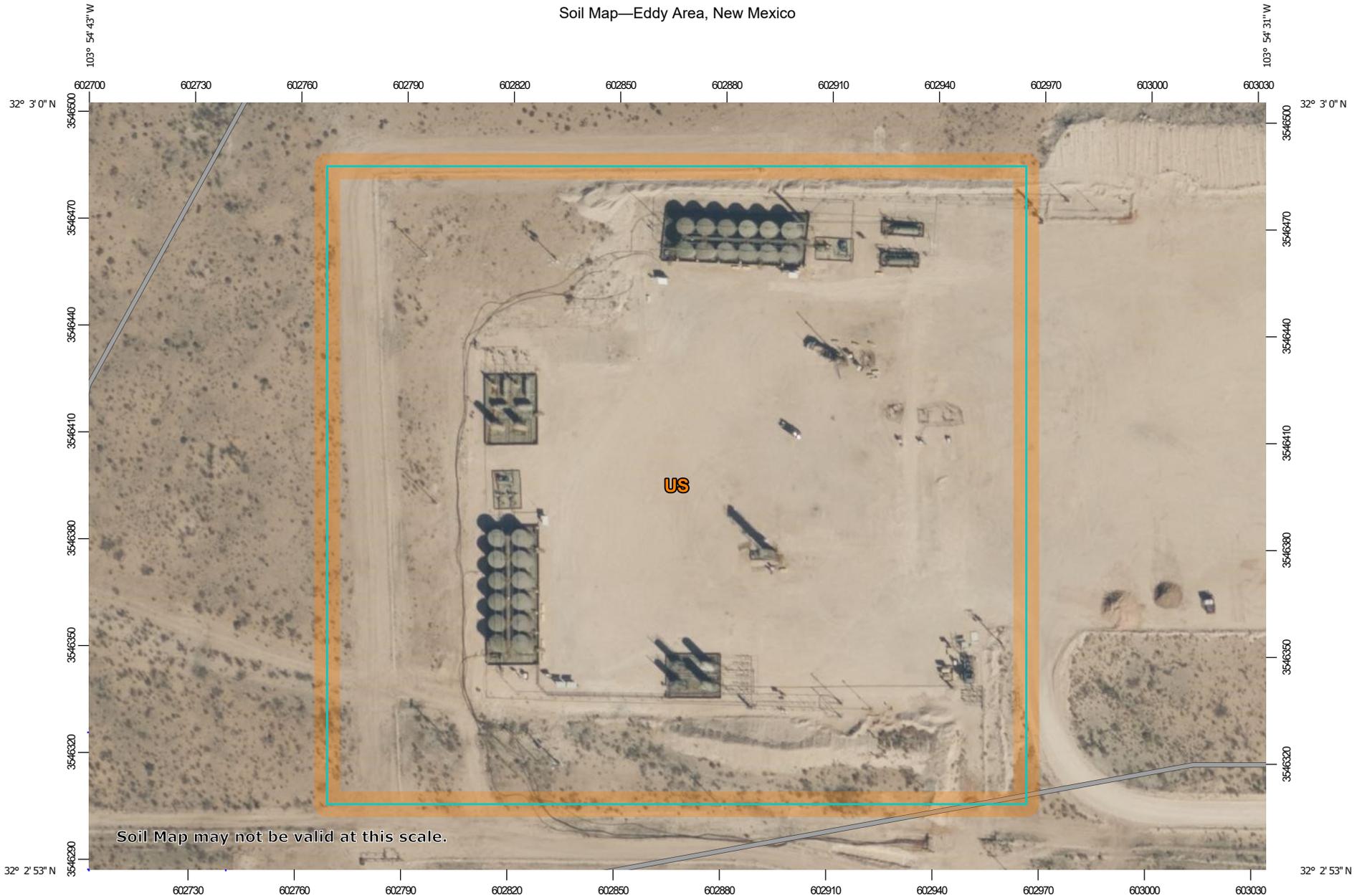


This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

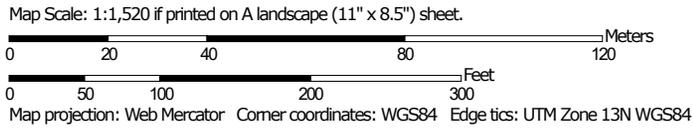
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/26/2023 at 3:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Soil Map—Eddy Area, New Mexico



Soil Map may not be valid at this scale.



Soil Map—Eddy Area, New Mexico

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Eddy Area, New Mexico

Survey Area Data: Version 18, Sep 8, 2022

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

Date(s) aerial images were photographed: Feb 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.

Soil Map—Eddy Area, New Mexico

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	8.8	100.0%
Totals for Area of Interest		8.8	100.0%

Map Unit Description: Upton-Simona complex, 1 to 15 percent slopes, eroded---Eddy Area,
New Mexico

Eddy Area, New Mexico

US—Upton-Simona complex, 1 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w66
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

Upton and similar soils: 40 percent
Simona and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upton

Setting

Landform: Ridges, fans
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 13 inches: gravelly loam
H3 - 13 to 21 inches: cemented
H4 - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 1 to 15 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Map Unit Description: Upton-Simona complex, 1 to 15 percent slopes, eroded---Eddy Area,
New Mexico

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

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 6 inches: gravelly fine sandy loam
H2 - 6 to 20 inches: gravelly fine sandy loam
H3 - 20 to 24 inches: indurated

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
*Capacity of the most limiting layer to transmit water (Ksat): 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 2.4 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

Minor Components

Rock outcrop

Percent of map unit: 9 percent
Hydric soil rating: No

Dune land

Percent of map unit: 8 percent
Hydric soil rating: No

Pajarito

Percent of map unit: 8 percent
Ecological site: R070BD003NM - Loamy Sand

Map Unit Description: Upton-Simona complex, 1 to 15 percent slopes, eroded---Eddy Area,
New Mexico

Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

Ecological site R070BD002NM Shallow Sandy

Accessed: 01/26/2023

General information

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

Figure 1. Mapped extent

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

Associated sites

R070BD004NM	Sandy Sandy sites often occur in association or in a complex with Shallow Sandy Sites.
-------------	--

Similar sites

R070BD004NM	Sandy Sandy ecological sites are similar to Shallow Sandy sites in species composition and Transition pathways.
-------------	---

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on plains, alluvial fans, uplands, or fan piedmonts. The parent material consists of mixed loamy alluvium or eolian material derived from igneous and sedimentary bedrock. The petrocalcic layer is at a depth of 10 to 25 inches and undulating.

Slopes are nearly level to undulating, usually less than 9 percent. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan piedmont (3) Alluvial fan
Elevation	866–1,372 m
Slope	1–9%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common.

Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity – short duration thunderstorms. Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer. The average frost-free season is from 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 the site. The vegetation of this site can take advantage of the moisture and the time it falls. Because of the soil profile, little moisture can be stored in the soil for any length of time. Moisture is readily available to the plants from the time it falls. Strong winds from the southwest blow from January through June which rapidly dries out the soil profile during a critical period for 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)	330 mm

Influencing water features

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

Soil features

Soils are very shallow to shallow, less than 20 inches in depth. Surface and subsurface textures are gravelly loamy sand, gravelly fine sandy loam or fine sandy loam.

An indurated calache layer occurs at depths of 6 to 25 inches and is at an average of 15 inches from the surface. Underlying material textures are very gravelly fine sandy loam, very gravelly sandy loam, gravelly fine sandy loam. Gravels are calcium carbonate concretions, calcium carbonate content ranges from 30 to 65 percent.

The indurated caliche layer typically holds water up in the profile for short periods within the root zone of plants. These soils will blow if left unprotected by vegetation.

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

Characteristic soils are:

- Simona
- Jerag

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loamy fine sand (3) Gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately slow to moderate

Soil depth	18–61 cm
Surface fragment cover <=3"	5–25%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	2.54–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8
Subsurface fragment volume <=3" (Depth not specified)	5–25%
Subsurface fragment volume >3" (Depth not specified)	0%

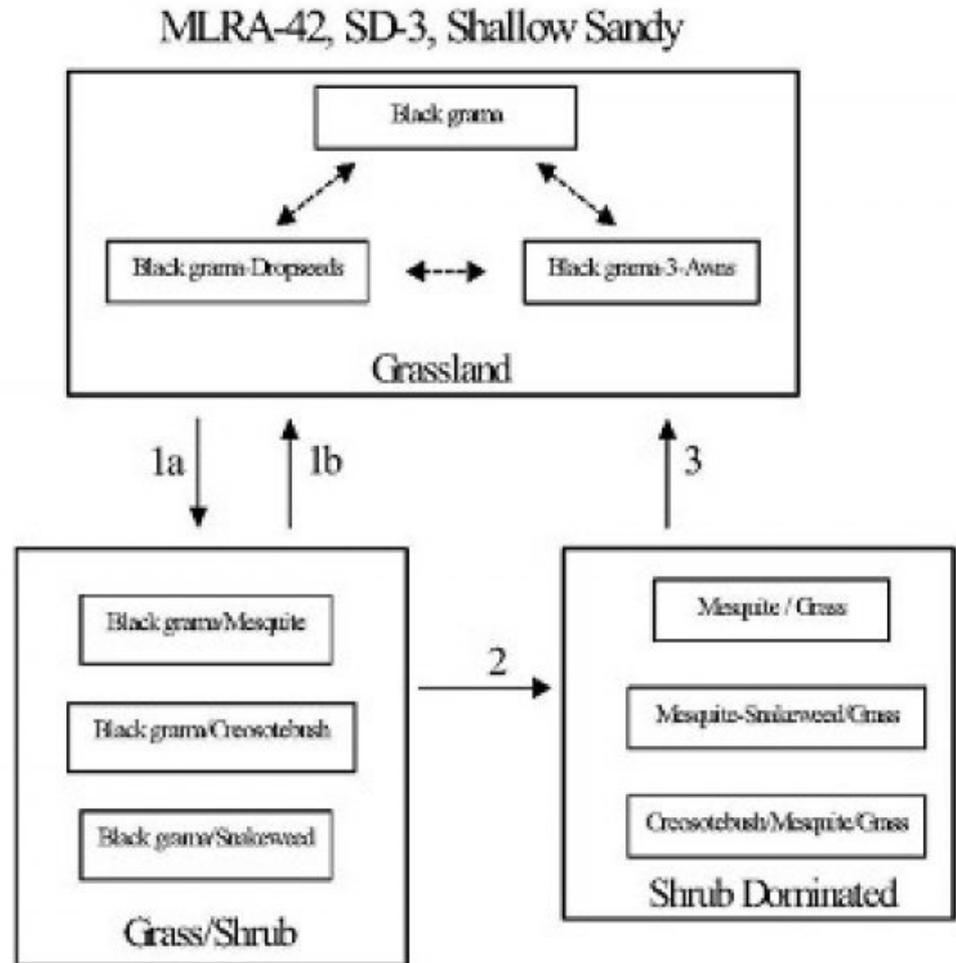
Ecological dynamics

Overview

The Shallow Sandy site occurs on upland plains, and tops of low ridges and mesas, associated with Sandy, Loamy Sand, and Shallow sites. Coarse to moderately coarse soil surface textures, shallow depth (<20 inches) to an indurated caliche layer (petrocalcic horizon), and an overwhelming dominance by black grama help to distinguish this site. The historic plant community of the Shallow Sandy site is a black grama dominated grassland sparsely dotted with shrubs. Shrubs, especially mesquite and creosotebush can increase or colonize due to the dispersal of shrub seeds by livestock or wildlife. This increase in mesquite and colonization of creosotebush may be enhanced by proximity to areas with existing high shrub densities. Fire suppression, and the loss of grass cover due to overgrazing or drought may facilitate the increase and encroachment of shrubs. Persistent loss of grass cover, competition for resources by shrubs, and periods of climate with increased winter precipitation and dry summers, may initiate the transition to a shrub-dominated state.

State and transition model

Plant Communities and Transitional Pathways (diagram)



- 1a. Seed dispersal, drought, overgrazing, fire suppression.
- 1b. Prescribed fire, brush control, prescribed grazing.
- 2. Persistent loss of grass cover, resource competition, increased winter precipitation.
- 3. Brush control, range seeding, prescribed grazing.

**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

Grassland: This site responds well to management and is resistant to state change, due to the shallow depth to petrocalcic horizon and sandy surface textures. The sandy surface textures allow rapid water infiltration and the petrocalcic horizon helps to keep water perched and available to shallow rooted grasses. Black grama is the dominant species in the historic plant community, averaging 50 to 60 percent of the total production for this site. Bush muhly, blue grama, and dropseeds are present as sub-dominants. Typically, yucca, javalinabush, range ratany, prickly pear, and mesquite are sparsely dotted across the landscape. Leatherweed croton, cutleaf

happlopappus, wooly groundsel, and threadleaf groundsel are common forbs. Continuous heavy grazing or extended periods of drought will cause a loss of grass cover characterized by a decrease in black grama, bush muhly, blue and sideoats grama, plains bristlegrass, and Arizona cottontop. Dropseeds and or threeawns may increase and become sub-dominant to black grama. Continued loss of grass cover in conjunction with dispersal of shrub seeds and fire suppression is believed to cause the transition to a state with increased amounts of shrubs (Grass/Shrub state). Diagnosis: Black grama is the dominant grass species. Grass cover uniformly distributed. Shrubs are a minor component averaging only two to five percent canopy cover. Litter cover is high (40-50 percent of area), and litter movement is limited to smaller size class litter and short distances (< . 5m). Other grasses that could appear on this site would include: six-weeks grama, fluffgrass, false-buffalograss, hairy grama, little bluestem, bristle panicum, cane bluestem, Indian ricegrass, tridens spp., and red lovegrass. Other woody plants include: pricklypear, cholla, fourwing saltbush, catclaw mimosa, winterfat, American tarbush and mesquite. Other forbs include: globemallow, verbena, desert holly, senna, plains blackfoot, trailing fleabane, fiddleneck, deerstongue, wooly Indianwheat, and locoweed.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	531	731	930
Forb	87	120	152
Shrub/Vine	54	74	94
Total	672	925	1176

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	30-35%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	40-50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	15-25%

Figure 5. Plant community growth curve (percent production by month). NM2802, R042XC002NM-Shallow Sandy-HCPC. SD-3 Shallow Sandy - Warm season plant community.

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

**State 2
Grass/Shrub**

**Community 2.1
Grass/Shrub**

Grass/Shrub: This state is characterized by the notable presence of shrubs, especially mesquite, broom snakeweed, and/or creosotebush, however grasses remain as the dominant species. Black grama is the dominant

grass species. Threeawns and or dropseeds are sub-dominant. The susceptibility of the Shallow Sandy site to shrub encroachment may be higher when located adjacent to other sites with high densities of mesquite or creosotebush. Retrogression within this site is characterized by decreases in grass cover and increasing densities of shrubs. Diagnosis: Black grama remains as the dominant grass species. Grass cover varies in response to the amount of shrub increase, ranging from uniform to patchy. Shrubs are found at increased densities relative to the grassland state, especially mesquite, creosotebush, or broom snakeweed. Transition to Grass/Shrub (1a) Historically fire may have kept mesquite and other shrubs in check by completely killing some species and disrupting seed production cycles and suppressing the establishment of shrub seedlings in others. Fire suppression combined with seed dispersal by livestock and wildlife is believed to be the factors responsible for the establishment and increase in shrubs. 1, 3 Loss of grass cover due to overgrazing, prolonged periods of drought, or their combination, reduces fire fuel loads and increases the susceptibility of the site to shrub establishment. Key indicators of approach to transition: Increase in the relative abundance of dropseeds and threeawns Presence of shrub seedlings Loss of organic matter—evidenced by an increase in physical soil crusts 8 Transition back to Grassland (1b) Brush control is necessary to initiate the transition back to the grassland state. If adequate fuel loads remain, possibly the reintroduction of fire as a management tool will assist in the transition back, however, mixed results have been observed concerning the effects of fire on black grama grasslands.6 Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover capable of sustaining fire.

**State 3
Shrub Dominated**

**Community 3.1
Shrub Dominated**

Shrub-Dominated: Across the range of soil types included in the Shallow Sandy site, mesquite is typically the dominant shrub, but it does occur as a co-dominant or sub-dominant species with creosotebush or broom snakeweed. Mesquite tends to dominate when the Shallow Sandy site occurs as part of a complex or in association with Sandy or Loamy Sand sites. Creosotebush tends to dominate on Shallow Sandy sites that occur as part of, or adjacent to Shallow Sites. Broom snakeweed increases in response to heavy grazing, but tends to cycle in and out depending on timing of rainfall. However, once the site is dominated by shrubs and snakeweed becomes well established, it tends to remain as a major component in the shrub dominated state. Diagnosis: Mesquite, creosotebush, or snakeweed cover is high, exceeding that of grasses. Grass cover is patchy with large connected bare areas present. Black grama, threeawns, or dropseeds may be the dominant grass. Evidence of accelerated wind erosion in the form of pedestalling of plants, and soil deposition around shrub bases may be common. Transition to Shrub-Dominated (2) Persistent loss of grass cover and the resulting increased competition between shrubs and remaining grasses for dwindling resources (especially soil moisture) may drive this transition.5 Additionally periods of increased winter precipitation may facilitate periodic episodes of shrub expansion and establishment. 4 Key indicators of approach to transition: Increase in size and frequency of bare patches. Loss of grass cover in shrub interspaces. Increased signs of erosion, evidenced by pedestalling of plants, and soil and litter deposition on leeward side of plants. 7 Transition back to Grassland (3) Brush control is necessary to reduce competition from shrubs and reestablish grasses. Range seeding may be necessary if insufficient grasses remain, The benefits, and costs, will vary depending upon the degree of site degradation, and adequate precipitation following seeding.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Warm Season			463–555	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	463–555	–
2	Warm Season			46–93	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	46–93	–
3	Warm Season			46–93	

	blue grama	BOGR2	<i>Bouteloua gracilis</i>	46-93	-
4	Warm Season			28-46	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	28-46	-
5	Warm Season			46-93	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	46-93	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	46-93	-
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	46-93	-
6	Warm Season			19-46	
	threeawn	ARIST	<i>Aristida</i>	19-46	-
7	Warm Season			46-93	
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	46-93	-
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	46-93	-
8	Warm Season			46-93	
	mat sandbur	CELO3	<i>Cenchrus longispinus</i>	46-93	-
	hooded windmill grass	CHCU2	<i>Chloris cucullata</i>	46-93	-
9	Other Perennial Grasses			28-46	
	Grass, perennial	2GP	<i>Grass, perennial</i>	28-46	-
Shrub/Vine					
10	Shrub			9-28	
	javelina bush	COER5	<i>Condalia ericoides</i>	9-28	-
11	Shrub			9-28	
	yucca	YUCCA	<i>Yucca</i>	9-28	-
12	Shrub			9-28	
	jointfir	EPHED	<i>Ephedra</i>	9-28	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	9-28	-
13	Shrub			9-28	
	featherplume	DAFO	<i>Dalea formosa</i>	9-28	-
14	Shrub			9-28	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	9-28	-
15	Other Shrubs			28-46	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	28-46	-
Forb					
16	Forb			19-46	
	leatherweed	CRPOP	<i>Croton pottsii var. pottsii</i>	19-46	-
	Goodding's tansyaster	MAPIG2	<i>Machaeranthera pinnatifida ssp. gooddingii var. gooddingii</i>	19-46	-
17	Forb			19-46	
	woolly groundsel	PACA15	<i>Packera cana</i>	19-46	-
	threadleaf ragwort	SEFLF	<i>Senecio flaccidus var. flaccidus</i>	19-46	-
18	Forb			9-28	
	whitest evening primrose	OEAL	<i>Oenothera albicaulis</i>	9-28	-
19	Other Forbs			9-28	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	9-28	-

Animal community

This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, swift fox, black-tailed jackrabbit, spotted ground squirrel, Ord's kangaroo rat, northern grasshopper mouse, coyote, horned lark, meadowlark, lark bunting, scaled quail, morning dove, side-blotched lizard, round-tailed horned lizard, marbled whiptail, prairie rattlesnake and ornate box turtle.

Hydrological functions

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

Hydrologic Interpretations
Soil Series Hydrologic Group
Jarag D
Simona D

Recreational uses

This site offers recreation for hiking, horseback riding, nature observation and photography, and quail and dove hunting. During years of abundant spring moisture, this site displays a riot of color from wildflowers during May and June. A few summer and fall flowers also occur.

Wood products

The natural potential plant community of this site affords little or no wood products. Where the site has been invaded by mesquite or cholla cactus the roots and stems of these plants provide attractive material for a variety of curiosities, such as lamps and small furniture.

Other products

This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year. Because of the sandy textures and shallow profile, this site will respond rapidly to management. As this site deteriorates, plants such as black grama, bush muhly, blue and sideoats grama, plains bristlegrass and Arizona cottontop, will decrease and be replaced by plants such as threeawns, mesquite, creosote bush, and broom snakeweed. This also causes a decrease in ground cover, leaving the soil to blow. This site responds best to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index Ac/AUM
100 - 76 2.5 – 3.5
75 – 51 3.2 – 4.6
50 – 26 4.5 – 7.5
25 – 0 7.6 +

Inventory data references

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

Other references

Literature References:

1. Brooks, M.L. and D.A. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pages 1–14 in K.E.M. Galley and T.P. Wilson (eds.). Proceedings of the Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species.
2. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. *J. Range Manage.* 36: 723-726.
3. Humphrey, R.R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. *Fire and ecosystems*. New York: Academic Press: 365-400.
4. Moir, W.H., and J. A. Ludwig. 1991. Plant succession and changing land features in desert grasslands. P. 15-18. In P.F. Ffolliott and W.T. Swank (eds.) *People and the temperate region: a summary of research from the United States Man and the Biosphere Program 1991*. U.S. Dept. State, Publ No. 9839, Nat. Tech. Info. Serv., U.S. Dept. Commerce, Springfield, Illinois. 63 p.
5. Tiedemann, A. R. and J. O. Klemmedson. 1977. Effect of mesquite trees on vegetation and soils in the desert grassland. *J. Range Manage.* 30: 361-367.
6. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, September). *Fire Effects Information System*, [Online]. Available: <http://www.fs.fed.us/database/feis/> [accessed 2/10/03].
7. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. *Soil Quality Information Sheets. Rangeland Soil Quality—Wind Erosion. Rangeland Sheet 10* [Online]. Available: <http://www.statlab.iastate.edu/survey/SQI/range.html>
8. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. *Soil Quality Information Sheets. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 7* [Online]. Available: <http://www.statlab.iastate.edu/survey/SQI/range.html>

Contributors

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Don Sylvester

Rangeland health reference sheet

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

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

Indicators

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

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

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

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

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

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

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

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

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

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

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

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

Dominant:

Sub-dominant:

Other:

Additional:

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

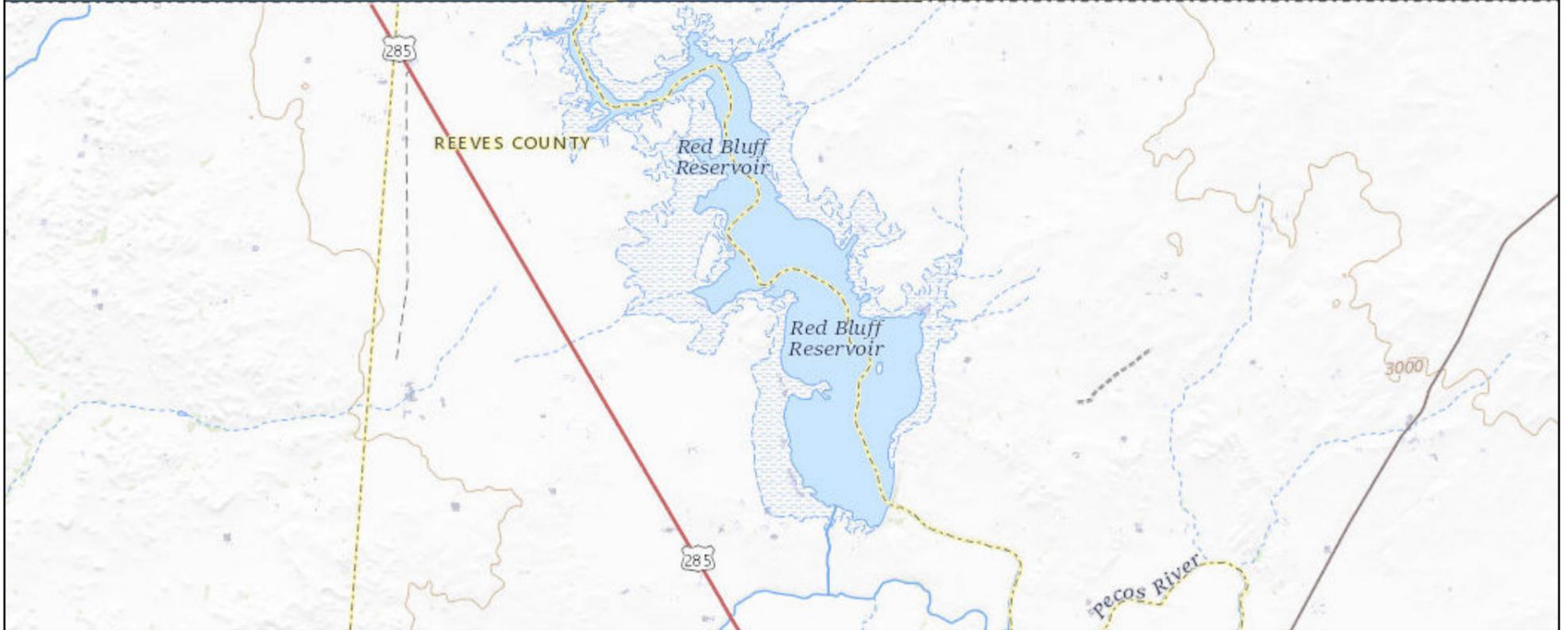
14. **Average percent litter cover (%) and depth (in):**

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

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

17. **Perennial plant reproductive capability:**

RDX 17 Federal #016H

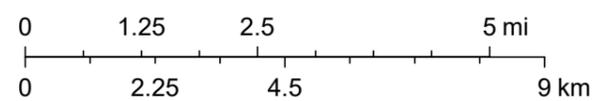


1/26/2023, 1:57:03 PM

Lithologic Units

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

1:144,448



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

ATTACHMENT 4

Monica Peppin

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: February 27, 2023 1:30 PM
To: Enviro, OCD, EMNRD; CFO_Spill, BLM_NM
Cc: Raley, Jim; Monica Peppin
Subject: RDX 17-16 Liner Inspection Notification nAPP2301628129

All,

Please accept this email as 48-hr notification that Vertex Resource Services has scheduled a liner inspection to be conducted for the following release:

nAPP2301628129 DOR: 01/12/2023 Site Name: RDX Federal 17 #016H

This work will be completed on behalf of WPX Energy Permian, LLC

On Thursday, March 2, 2023 at approximately 11:00 a.m., Hunter Klein will be on site to conduct the liner inspection. He can be reached at 575-263-3124. If you need directions to the site, please do not hesitate to contact him. If you have any questions or concerns regarding this notification, please give me a call at 575-361-9880.

Thank you,

Monica Peppin, A.S.
Project Manager

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

P 575.725.5001 Ext. 711
C 575.361.9880
F

www.vertex.ca

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

CONDITIONS

Action 198973

CONDITIONS

Operator: WPX Energy Permian, LLC Devon Energy - Regulatory Oklahoma City, OK 73102	OGRID: 246289
	Action Number: 198973
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
rhamlet	We have received your closure report and final C-141 for Incident #NAPP2301628129 RDX FEDERAL 17 #016H, thank you. This closure is approved.	8/2/2023