Wescom Inc.
1224 Standpipe Road
Carlsbad, New Mexico 88220

(575) 840-3940
wescominc.com

September 02, 2021

Robert Hamlet, Victoria Venegas, and/or Chad Hensley
State of New Mexico
Energy, Minerals, and Natural Resources
New Mexico Oil Conservation Division
811 South First Street
Artesia, New Mexico 88210

Re: Remediation Plan

Company:	Kaiser-Francis Oil Company
Location:	North Bell Lake Unit 4 #15 SWD
API:	30-025-24771
PLSS:	Unit K Sec 08 T23S R34E
GPS:	32.3173599, -103.4942551
Incident ID:	nAPP2116429491

Background

Wescom, Inc., hereafter referred to as Wescom, has prepared a remediation plan on behalf of Kaiser-Francis Oil Company, henceforth referred to as KFOC, regarding the release at the North Bell Lake Unit 4 #15 SWD (Site) located in Unit K, Section 08, Township 23 South and Range 34 East in Lea County, New Mexico. The GPS coordinates are as follows: North 32.3173599 and West -103.4942551. Surface owner for this site is the Bureau of Land Management. The Site falls within New Mexico Oil Conservation Division (NMOCD) District 1 Hobbs.

On June 12, 2021, a hole developed in an underground poly line which resulted in the release of 100 barrels (bbls) of produced water. KFOC immediately isolated the source of the leak and constructed berms surrounding the spill area. Approximately 15 bbls of produced water was recovered. The spill area is directly to the North and West side of the caliche pad at the North Bell Lake Unit 4 #15 SWD as seen in Figure 1. Horizontal and vertical delineation sampling was conducted on June 16, 2021, and June 17, 2021. Wescom personnel returned to the Site on July 02, 2021, to continue vertical delineation sampling. Depth to water (DTW) was determined on July 27, 2021, at an existing groundwater monitoring well adjacent to the caliche pad as seen in Figure 1.

Surface & Ground Water

The New Mexico Office of the State Engineer (OSE) records indicate the nearest ground water measurement, CP 00556 POD1, is greater than 200 feet below ground surface (bgs) and is 0.25 miles South of the location, shown in Attachment C. The log for CP 00556 POD1 was filed in 1974; however, there are three additional ground water measurements within a one-mile radius of the Site that were drilled in the last 25 years. The three wells, CP 00872 POD1, CP 01502 POD1 and CP01502 POD2 all have DTW

measurements that exceed 200 feet bgs (see Attachment C). There are no playas, lakes, ponds, riverines or wetlands located within a half-mile radius of this site (see Attachment D).

Karst Potential

According to data from the Bureau of Land Management, this Site is located within low karst potential as shown in Attachment E. There are no indicators of karst around the Site surface.

Depth to Groundwater Determination

Due to a lack of groundwater data within the last 25 years, KFOC requested entry at an existing water monitoring well adjacent to the 4-15 SWD location (see Figure 1). On July 27, 2021, a Heron oil-water interface meter with a 300-foot tape was used to enter the existing well located 95 feet to the south of the spill area. Meter functionality was tested prior to field use and the tape was decontaminated with Simple Green ® and deionized water. Casing for the well extended nine inches above ground surface and the metal lid to the casing was secured with tape. Wescom personnel removed the metal lid prior to lowering the meter's probe into the well. A depth of 300-feet bgs was achieved; the probe did not detect any water at that depth. There was no visible condensation or liquid on the tape or probe, and both appeared to be dry when removed from the casing.

The determination of DTW was necessary to verify the use of the highest Recommended Remediation Action Level (RRAL). The target cleanup levels are determined using the NMOCD Closure Criteria (19.15.29.12.B(4) and Table 1 NMAC, inserted below) including karst guidelines from the Bureau of Land Management. Since the DTW determination proved to be greater than 100-foot bgs, the applicable RRAL are 10 parts per million (ppm) Benzene, 50 ppm combined benzene, toluene, ethyl benzene, and total xylenes (BTEX) and, 2500 ppm Total Petroleum Hydrocarbons (TPH), characterization of vertical and horizontal extent of chloride concentration to a level of 20,000 milligrams per kilogram (mg/kg) is also required.

North Bell Lake Unit 4 #15 SWD
Incident ID: nAPP2116429491

Closure Criteria (19.15.29.12.B(4) and Table 1 NMAC)						
4-15 SWD - 6.12.2021 Spill --32.3173599, -103.4942551						
Depth to Groundwater		**Closure Criteria (units in mg/kg)**				
		Chloride * numerical limit or background, whichever is greater	**TPH**	**GRO+DRO**	**BTEX**	**Benzene**
Based on high karst potential		600	100		50	10
less than 50 ft bgs or **no water data within 1/2 mile**		600	100		50	10
51 ft to 100 ft		10000	2500	1000	50	10
greater than 100 ft		20000	2500	1000	50	10
Surface water	**yes or no**	**If yes, then**				
< 300 feet from continuously flowing watercourse or other significant watercourse?	no					
< 200 feet from lakebed, sinkhole or playa lake?	no					
Water Well or Water Source						
< 500 feet from spring or a private, domestic fresh water well used by less than 5 households for domestic or stock watering purposes?	no					
< 1000 feet from fresh water well or spring?	no					
Human and Other Areas						
< 300 feet from an occupied permanent residence, school, hospital, institution or church?	no					
within incorporated municipal boundaries or within a defined municipal fresh water well field?	no					
< 100 feet from wetland?	no					
within area overlying a subsurface mine?	no					
within an unstable area?	no					
within a 100-year floodplain?	no					

Site Assessment and Delineation

Beginning June 16, 2021, KFOC contracted Wescom to conduct off-site delineation to determine the horizontal and vertical extent of the spill. Horizontal delineation sampling was completed on June 17, 2021. A background sample, BG03, was collected 50 feet to the south of the caliche pad, as shown in Figure 1. A total of seven samples were collected on June 16, 2021, and 21 samples were collected on June 17, 2021. Samples analyzed for the purpose of determining the impacted area were delineated to the strictest closure criteria prior to DTW determination. Samples collected inside the impacted area are considerably lower than the applicable RRAL for this Site (see Table 2). Delineation sample points are presented in Figure 1; laboratory analysis results are listed in Table 1 and field screening results are listed in Table 2.

On July 02, 2021, Atkins Engineering drilled one borehole to determine the vertical extent of the release as seen in Figure 1. Laboratory analysis established a chloride concentration of 997 mg/kg at a depth of 19-feet; TPH and BTEX were non-detect at that depth (see Table 1). All of the analytical data referenced in Table 1 and field screen data shown in Table 2 are below the RRAL for the Site, indicating that soil remediation is not required. However, KFOC is committed to removing the visible surface contamination from the spill area.

Remediation Plan

The spill impact area is approximately 21,700 square feet and extends to the North and West side of the caliche pad. KFOC plans to scrape the soil surface using a backhoe to a depth of one half-foot and collect confirmation samples. Should the visible contamination extend beyond one half-foot, field screens will be used to verify compliance with the previously referenced RRALs (page 2). Approximately 402 yards of

contaminated soil will be removed from the spill area. Impacted area will be backfilled after confirmation sampling has been completed. Backfill material will be consistent with natural soils found in the immediate spill area.

A confirmation sampling plan has been produced using Visual Sample Plan (VSP), software version 7.15 (see Attachment E). A nonparametric sampling design that compares the Site's average TPH concentration in ppm and average chloride concentration in ppm to a fixed threshold (2,500 ppm TPH and 20,000 ppm chlorides) recommends the collection of 27 composite samples. The Site's average or mean concentration for TPH and chlorides were determined using field screening data. Fixed threshold values are consistent with the RRALs referenced in Table 1 NMAC.

As shown in USDA Soil Resource Report (Attachment G) the soil type throughout the spill area is homogenous, thus supporting the VSP confirmation sampling plan. A total of 33 composite samples will be collected, 27 samples inside the impacted area and 6 side-wall samples. A 48-hour notice will be given to the state prior to conducting confirmation sampling. Closure request will follow within 90 days of Site remediation and confirmation sampling. KFOC hereby requests approval for the proposed remediation plan at the 4-15 SWD site associated with release nAPP2116429491.

If you have any questions or comments, please do not hesitate to call Mrs. Ashley Giovengo at (505) 382-1211.

Sincerely,

Wescom, Inc.

Ashley Giovengo
Environmental Manager-Permian

cc: Charles Lock, KFOC
Robert Hamlet, NMOCD
Victoria Venegas, NMOCD
Chris Hensley, NMOCD

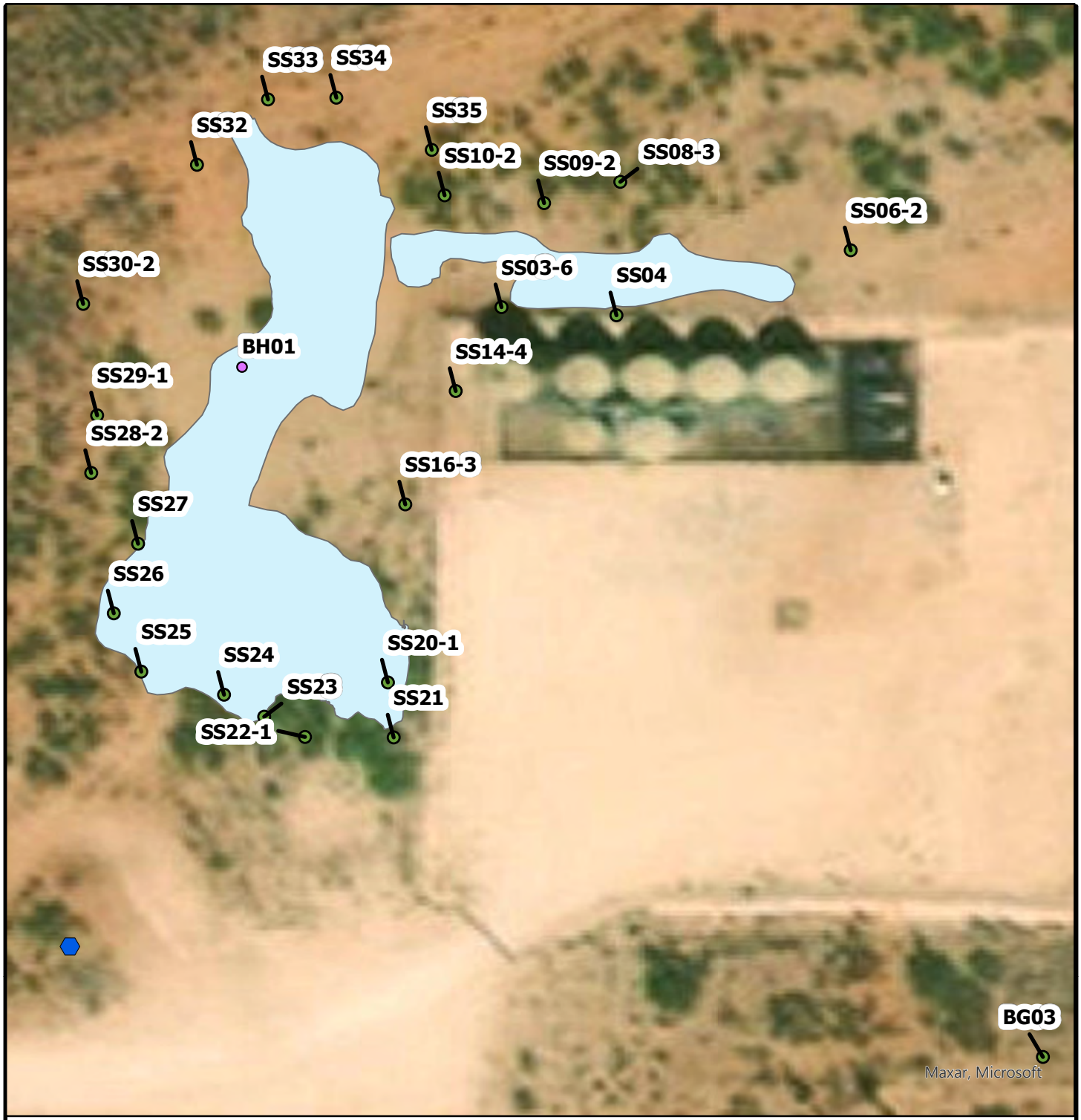
Figures

Tables

Attachments

Attachment F. VSP Sampling Plan
Attachment G. USDA Custom Soil Resource Report

Figure



Legend

- GW Monitoring Well
- Borehole Point
- Sample Points
- Visible Spill Area

Figure 1. Spill Area
North Bell Lake Unit 4 #015
Incident ID: NAPP2116429491
API: 30-025-24771
GPS Coordinates: 32.3173599, -103.4942551
Lea County, New Mexico
Kaiser-Francis Oil Company

WESCOM

Table

North Bell Lake Unit 4 #15 SWD - 06.12.2021 Spill
Kaiser Francis Oil Company
June 28, 2021

Table 1. Delineation Laboratory Analysis Results

Sample Description			Petroleum Hydrocarbons				Inorganic
			Volatile		Extractable		
Sample ID	Depth (ft.)	Date	Benzene (mg/kg)	BTEX (total) (mg/kg)	TPH (mg/kg)	GRO+DRO (mg/kg)	Chloride (mg/kg)
Closure Criteria			**10**	**50**	**2500**	**1000**	**20000**
SS03-6	0	6/17/2021	ND	ND	ND	ND	73.1
SS04	0	6/16/2021	ND	ND	ND	ND	181
SS06-2	0	6/17/2021	ND	ND	ND	ND	127
SS08-3	0	6/17/2021	ND	ND	ND	ND	54.3
SS09-2	0	6/16/2021	ND	ND	ND	ND	ND
SS10-2	0	6/16/2021	ND	ND	ND	ND	ND
SS14-4	0	6/17/2021	ND	ND	ND	ND	238
SS16-3	0	6/17/2021	ND	ND	ND	ND	ND
SS17-4	0	6/17/2021	ND	ND	ND	ND	177
SS20-1	0	6/17/2021	ND	ND	ND	ND	ND
SS21	0	6/17/2021	ND	ND	ND	ND	ND
SS22-1	0	6/17/2021	ND	ND	ND	ND	ND
SS23	0	6/17/2021	ND	ND	ND	ND	ND
SS24	0	6/17/2021	ND	ND	ND	ND	ND
SS25	0	6/17/2021	ND	ND	ND	ND	136
SS26	0	6/17/2021	ND	ND	ND	ND	ND
SS27	0	6/17/2021	ND	ND	ND	ND	ND
SS28-2	0	6/17/2021	ND	ND	ND	ND	ND
SS29-1	0	6/17/2021	ND	ND	ND	ND	ND
SS30-2	0	6/17/2021	ND	ND	ND	ND	ND
SS32	0	6/17/2021	ND	ND	ND	ND	ND
SS33	0	6/17/2021	ND	ND	ND	ND	ND
SS34	0	6/17/2021	ND	ND	ND	ND	32.5
SS35	0	6/17/2021	ND	ND	ND	ND	39.3
BH01	19	7/2/2021	ND	ND	ND	ND	997
BG03	0	6/16/2021	ND	ND	ND	ND	ND
BG03	2	6/16/2021	ND	ND	ND	ND	ND
BG03	4	6/16/2021	ND	ND	ND	ND	ND
BG03	6	6/16/2021	ND	ND	ND	ND	ND

Abbreviations:
BTEX - Benzene, Toluene, Ethylene, Xylene
DRO - Diesel Range Organics
ft. - feet
GRO - Gasoline Range Organics
mg/kg - milligrams per kilogram
ND - Non-detect
TPH - Total Petroleum Hydrocarbons

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North Bell Lake Unit 4 #15 SWD - 06.12.2021 Spill
Kaiser Francis Oil Company
June 16, 2021

Table 2. Field Screening Results

Sample Description			Field Screening		
Sample ID	Depth (ft.)	Date	PetroFlag (TPH)	Mohr Method	EC
			ppm	ppm	µS/cm
Closure Criteria			**100**	**600**	
SS01	0	6/16/2021	-	1100	3.25
SS01-1	0	6/16/2021	-	800	4
SS01-3	0	6/16/2021	-	-	4
SS02	0	6/16/2021	-	1000	4
SS02-1	0	6/16/2021	-	1700	4
SS02-3	0	6/16/2021	-	-	4
SS03	0	6/16/2021	-	800	4
SS03-1	0	6/16/2021	161	400	2.6
SS03-3	0	6/16/2021	101	150	1.34
SS03-6	0	6/17/2021	-	-	1.7
SS04	0	6/16/2021	88	250	1.73
SS05	0	6/16/2021	-	3000	4
SS05-1	0	6/16/2021	-	1100	4
SS05-4	0	6/17/2021	-	800	4
SS06	0	6/16/2021	-	500	2.97
SS06-1	0	6/16/2021	293	350	2.6
SS06-2	0	6/17/2021	-	400	3.1
SS07	0	6/16/2021	-	2400	4
SS07-1	0	6/16/2021	162	300	2.61
SS07-2	0	6/16/2021	54	150	1.67
SS08	0	6/16/2021	-	1200	4
SS08-1	0	6/16/2021	-	1200	4
SS08-2	0	6/16/2021	-	600	3.2
SS08-3	0	6/17/2021	-	-	0.8
SS09	0	6/16/2021	188	350	2.61
SS09-2	0	6/16/2021	85	100	1.66
SS10	0	6/16/2021	386	200	2.52
SS10-2	0	6/16/2021	30	200	0.19
SS11	6	6/16/2021	-	1400	4
SS11	10	6/16/2021	-	2300	4
SS11	11	6/16/2021	-	1200	4
SS12	2	6/16/2021	-	800	4
SS12	4	6/16/2021	-	800	4
SS12	6	6/16/2021	-	1250	4

Abbreviations:
TPH - Total Petroleum Hydrocarbons
ppm - parts per million
µS/cm - microsiemens per centimeter
BTEX - Benzene, Toluene, Ethylene, Xylene
ft. - feet

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North Bell Lake Unit 4 #15 SWD - 06.12.2021 Spill

Kaiser Francis Oil Company
June 16, 2021

Table 2. Field Screening Results

Sample Description			Field Screening		
Sample ID	Depth (ft.)	Date	PetroFlag (TPH)	Mohr Method	EC
			ppm	ppm	µS/cm
Closure Criteria			**100**	**600**	
SS12	8	6/16/2021	-	1350	4
SS12	10	6/16/2021	-	-	4
SS12	11	6/16/2021	-	-	4
SS13	0	6/16/2021	-	-	4
SS14	0	6/17/2021	-	250	2.51
SS14-4	0	6/17/2021	-	300	2.9
SS15	0	6/17/2021	-	-	3.83
SS16-3	0	6/17/2021	-	-	1.1
SS17	0	6/17/2021	-	200	2.45
SS17-4	0	6/17/2021	-	-	1.06
SS18	0	6/17/2021	-	100	1.76
SS19	0	6/17/2021	-	100	0.24
SS20	0	6/17/2021	-	100	0.1
SS20-1	0	6/17/2021	-	-	0.12
SS21	0	6/17/2021	-	100	0.12
SS23	0	6/17/2021	-	-	0.15
SS24	0	6/17/2021	-	-	0.13
SS25	0	6/17/2021	-	-	1.15
SS26	0	6/17/2021	-	-	0.5
SS27	0	6/17/2021	-	-	0.33
SS28-2	0	6/17/2021	-	-	0.12
SS30-2	0	6/17/2021	-	-	0.08
SS32	0	6/17/2021	-	-	0.29
SS33	0	6/17/2021	-	-	0.14
SS34	0	6/17/2021	-	200	1.22
SS35	0	6/17/2021	-	200	2.52
BG01	0	6/16/2021	-	150	0.42
BG01	2	6/16/2021	-	400	1.67
BG01	4	6/16/2021	-	1000	4
BG03	0	6/16/2021	-	100	0.11
BG03	2	6/16/2021	-	100	0.11
BG03	4	6/16/2021	-	-	0.1
BG03	6	6/16/2021	29	150	0.13

Abbreviations:
TPH - Total Petroleum Hydrocarbons
ppm - parts per million
µS/cm - microsiemens per centimeter
BTEX - Benzene, Toluene, Ethylene, Xylene
ft. - feet

Attachment A

Signed C-141

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	NAPP2116429491
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Kaiser-Francis Oil Company	OGRID 12361
Contact Name Aaron Daniels	Contact Telephone 918-491-4352
Contact email aarond@kfoc.net	Incident # *(assigned by OCD)* nAPP2116429491
Contact mailing address 6733 S. Yale Ave, Tulsa, OK 74136	

Location of Release Source

Latitude 32.3173599 Longitude -103.4942551
(NAD 83 in decimal degrees to 5 decimal places)

Site Name North Bell Lake Unit 4 #15 SWD	Site Type SWD
Date Release Discovered 6/12/2021	API# *(if applicable)* 30-025-24771

Unit Letter	Section	Township	Range	County
K	08	23S	34E	Lea

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

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 100	Volume Recovered (bbls) 15
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☒ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release
A hole developed in the underground poly line resulting in a release of ~100 bbls of produced fluid. ~15 bbls was recovered with a vac truck. Sampling for delineation/remediation purposes is currently underway.

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State of New Mexico
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Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? The release was greater than 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Yes. Aaron Daniels – KFOC. NMOCD via Notice of Release. 6/13/2021 via Notice of Release (NMOCD Online Portal).	

Initial Response

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

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

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

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

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

Printed Name: Aaron Daniels Title: Sr. EHS Representative

Signature: _____ Date: 6/28/21

email: aarond@kfoc.net Telephone: 918-491-4352

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

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

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

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

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

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

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State of New Mexico
Oil Conservation Division

Incident ID	NAPP2116429491
District RP	
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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: Aaron Daniels Title: Sr. EH&S Representative

Signature: Date: 8/17/21

email: aarond@kfoc.net Telephone: 918-491-4352

OCD Only

Received by: Date:

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Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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: Aaron Daniels Title: Sr. EH&S Representative

Signature: Aaron Daniels Date: 8/17/21

email: aaroud@kfoc.net Telephone: 918-491-4352

OCD Only

Received by: Chad Hensley Date: 10/06/2021

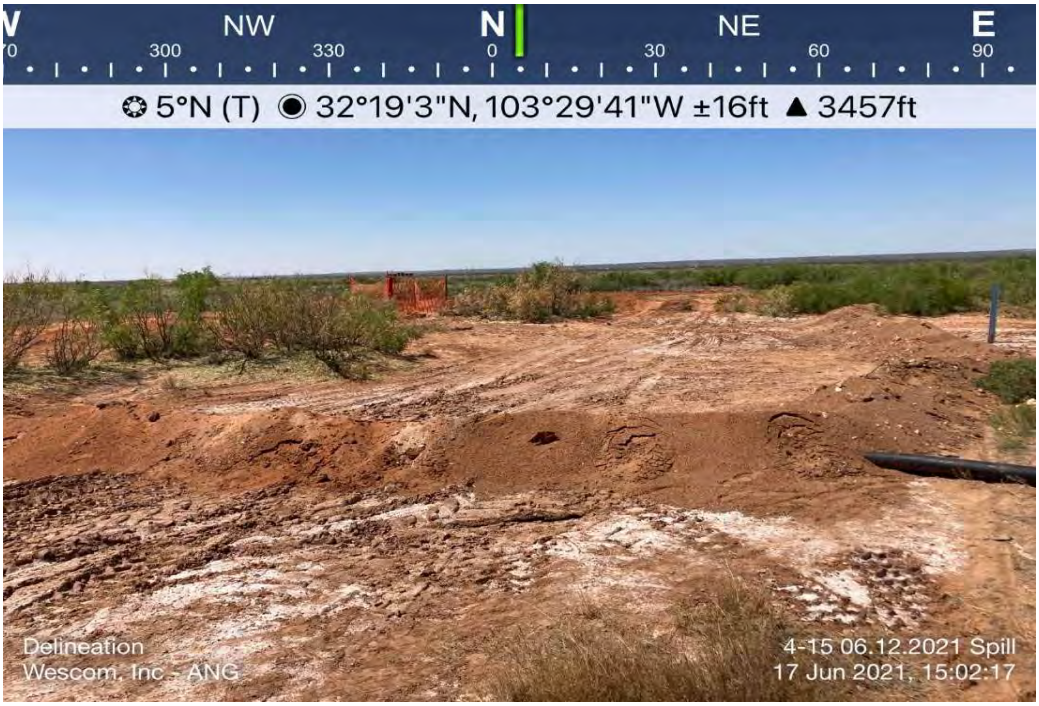
☒ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: Chad Hensley Date: 10/06/2021

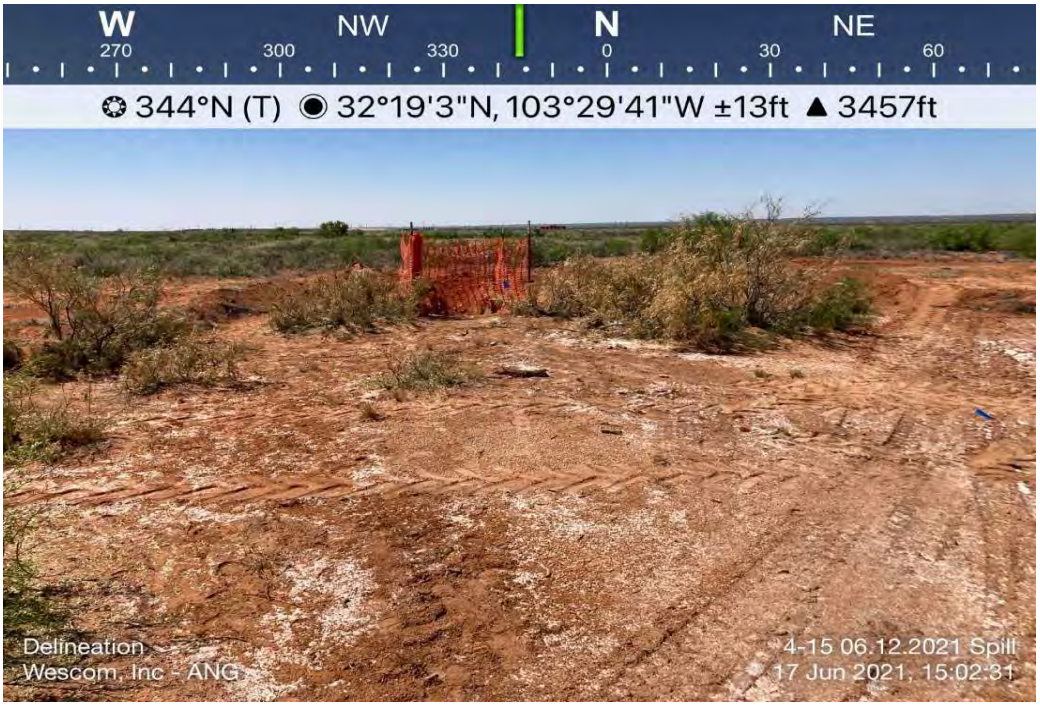
Attachment B

Site Photos

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



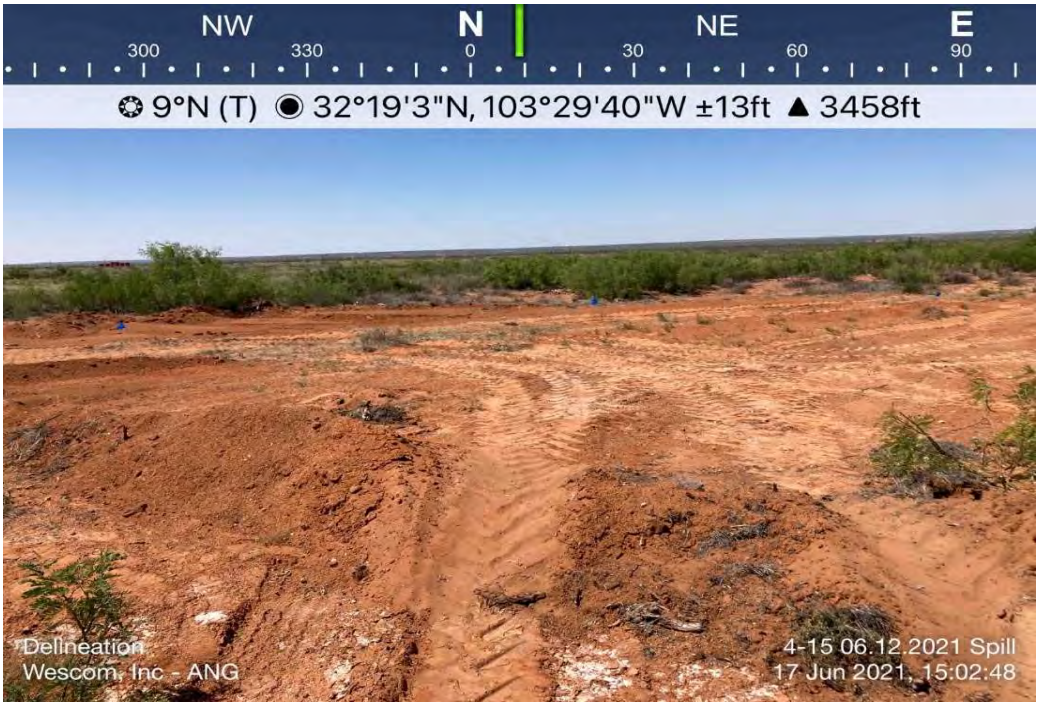
Southeast Side of Spill Area



Northwest Side of Spill Area

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

Northeast Side of Spill Area



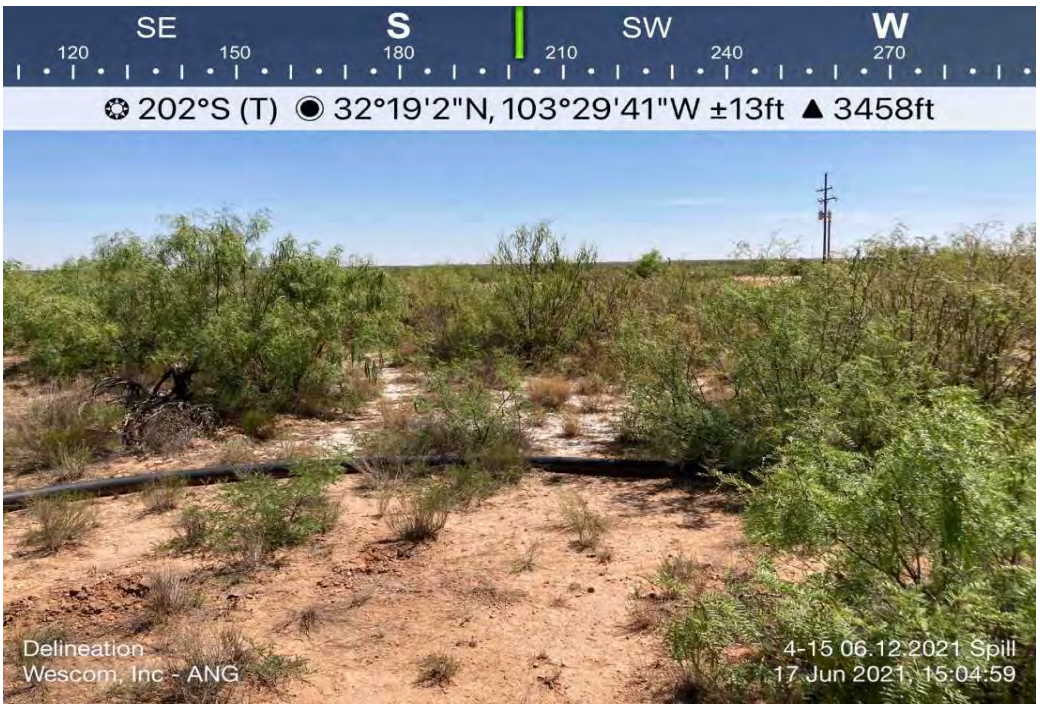
North Side of Spill Area

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

East Side of Spill Area

South Side of Spill Area

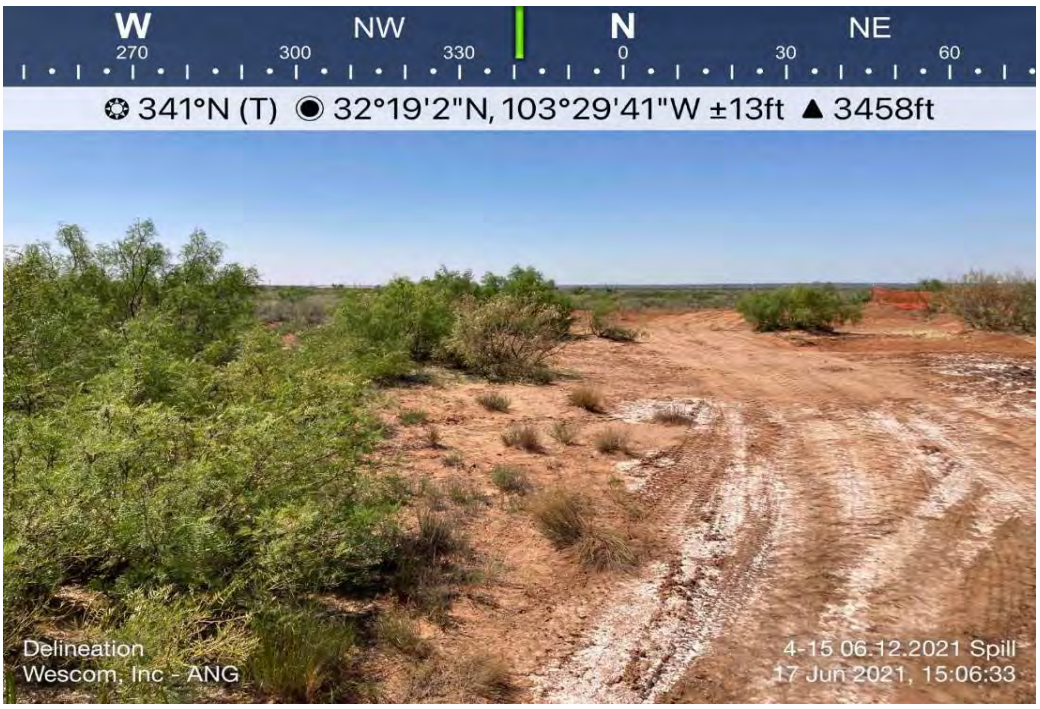
North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



South Side of Spill Area

South Side of Spill Area

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



West Side of Spill Area

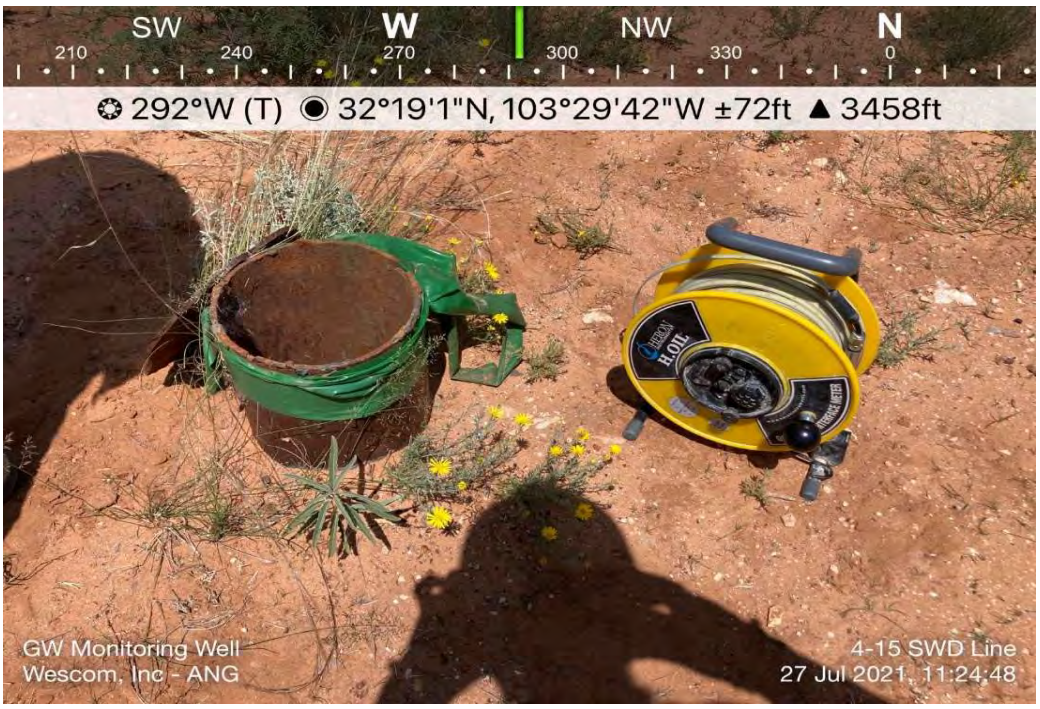
Borehole Drilling BH01

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

BH01 Core Samples

GW Monitoring Well

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



GW Monitoring Well

Water Monitoring Well Entry (total well depth 300 feet bgs)

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

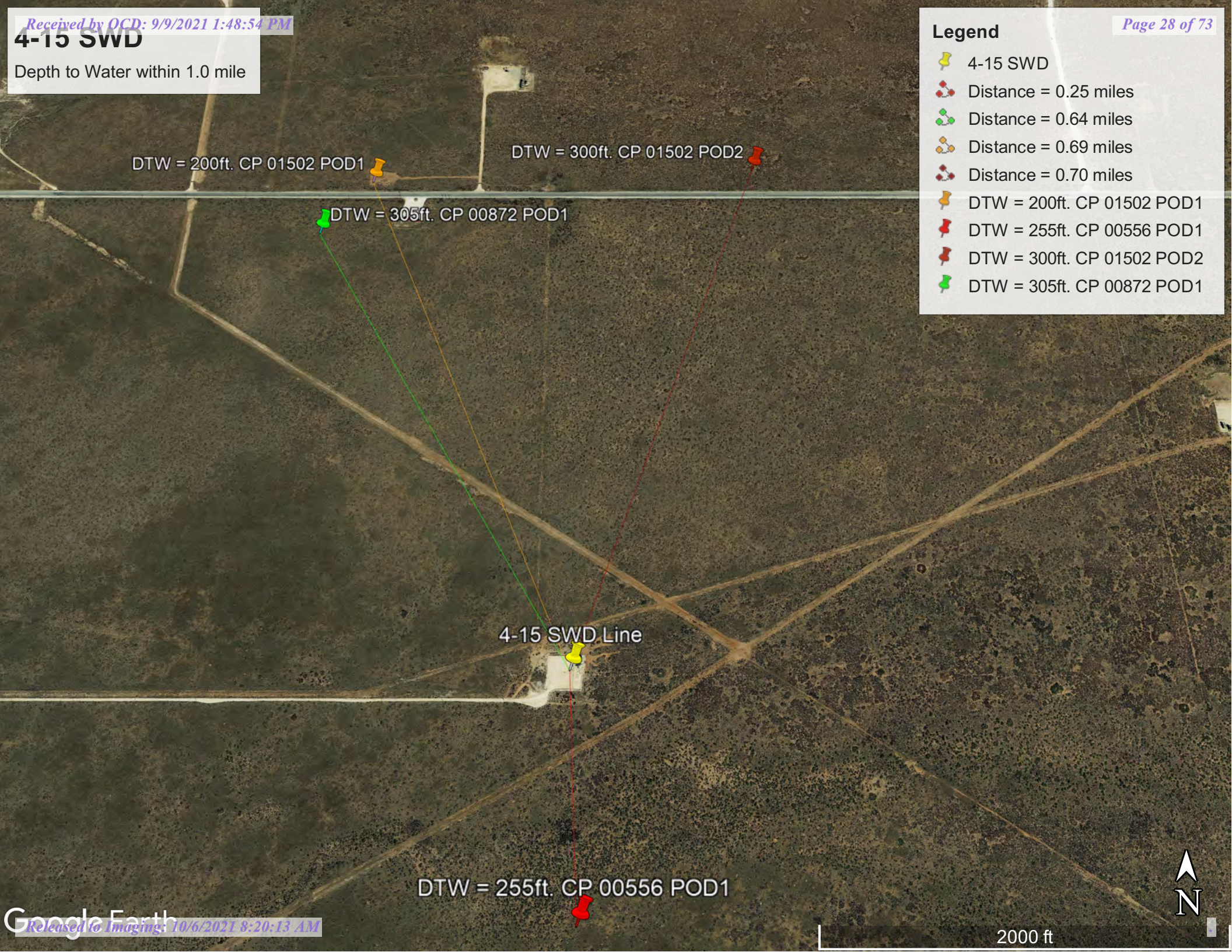
Water Monitoring Well Entry (total well depth 300 feet bgs)

Attachment C

Depth to Water

4-15 SWD

Depth to Water within 1.0 mile



Legend

- 4-15 SWD
- Distance = 0.25 miles
- Distance = 0.64 miles
- Distance = 0.69 miles
- Distance = 0.70 miles
- DTW = 200ft. CP 01502 POD1
- DTW = 255ft. CP 00556 POD1
- DTW = 300ft. CP 01502 POD2
- DTW = 305ft. CP 00872 POD1

New Mexico Office of the State Engineer
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 Number	Q64	Q16	Q4	Sec	Twn	Rng	X	Y
	CP 00556 POD1	4	4	3	08	23S	34E	641762	3576206

Driller License: 46 **Driller Company:** ABBOTT BROTHERS COMPANY

Driller Name: ABBOTT, MURRELL

Drill Start Date:	09/27/1974	**Drill Finish Date:**	10/17/1974	**Plug Date:**	
Log File Date:	10/25/1974	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	28 GPM
Casing Size:	7.00	**Depth Well:**	497 feet	**Depth Water:**	255 feet

Water Bearing Stratifications:	Top	Bottom	Description
	255	497	Other/Unknown

Casing Perforations:	Top	Bottom
	397	497

Meter Number:	8511	**Meter Make:**	MASTER
Meter Serial Number:	162038091	**Meter Multiplier:**	1.0000
Number of Dials:	9	**Meter Type:**	Diversion
Unit of Measure:	Gallons	**Return Flow Percent:**	
Usage Multiplier:		**Reading Frequency:**	Quarterly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
08/20/2004	2004	42932	A	jw		0	
12/04/2004	2004	52692	A	jw		2.995	
06/06/2014	2014	301111	A	RPT		0	
10/01/2014	2014	42846900	A	RPT	Changeout 6-6-14	0	
12/31/2014	2014	52078300	A	RPT		28.330	
01/01/2015	2015	52078300	A	RPT		0	
02/01/2015	2015	54551900	A	RPT		7.591	
03/27/2015	2015	8539300	A	RPT	Changeout 3-27-15	0	
03/27/2015	2015	58752900	A	RPT		12.892	
04/30/2015	2015	11420700	A	RPT		8.843	
05/31/2015	2015	14304800	A	RPT		8.851	
07/01/2015	2015	17059300	A	RPT		8.453	
08/01/2015	2015	19766900	A	RPT		8.309	
01/01/2016	2016	29255500	A	RPT		29.119	
02/01/2016	2016	29935100	A	RPT		2.086	
03/02/2016	2016	29935100	A	RPT		0	
04/01/2016	2016	29935100	A	RPT		0	
05/01/2016	2016	29935100	A	RPT		0	
06/01/2016	2016	30608200	A	RPT		2.066	
07/01/2016	2016	30608200	A	RPT		0	

08/01/2016	2016	35219100	A	RPT	14.150
09/01/2016	2016	37237600	A	RPT	6.195
10/01/2016	2016	39565700	A	RPT	7.145
11/01/2016	2016	41758893	A	RPT	6.731
12/01/2016	2016	42681000	A	RPT	2.830
12/31/2016	2016	44051528	A	RPT	4.206
01/31/2017	2017	44051556	A	RPT	0
02/28/2017	2017	45103057	A	RPT	3.227
03/31/2017	2017	47434243	A	RPT	7.154
04/30/2017	2017	48896700	A	RPT	4.488
05/31/2017	2017	51591700	A	RPT	8.271
06/30/2017	2017	54128300	A	RPT	7.785
07/31/2017	2017	55958997	A	RPT	5.618
08/14/2017	2017	56239094	A	RPT	0.860
08/14/2017	2017	0	A	RPT	0
08/21/2017	2017	592800	A	RPT	1.819
09/30/2017	2017	593300	A	RPT	0.002
10/31/2017	2017	2259200	A	RPT	5.112
11/30/2017	2017	3589700	A	RPT	4.083
12/31/2017	2017	5014800	A	RPT	4.373
01/31/2018	2018	6071400	A	RPT	3.243
02/28/2018	2018	6484000	A	RPT	1.266
03/31/2018	2018	8664100	A	RPT	6.690
05/31/2018	2018	12408500	A	RPT	11.491
10/31/2018	2018	21487685	A	RPT	27.863
11/30/2018	2018	21487685	A	RPT	0
03/31/2019	2019	21487685	A	RPT	0
04/30/2019	2019	21487685	A	RPT	0

**YTD Meter Amounts:	Year	Amount
	2004	2.995
	2014	28.330
	2015	54.939
	2016	74.528
	2017	52.792
	2018	50.553
	2019	0

New Mexico Office of the State Engineer
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 Number	Q64	Q16	Q4	Sec	Twns	Rng	X	Y
	CP 00872 POD1	1	1	1	08	23S	34E	641225	3577504*

Driller License: 1184 **Driller Company:** WEST TEXAS WATER WELL SERVICE
Driller Name: COLLIS, ROBERT E.

Drill Start Date: 09/29/1997 **Drill Finish Date:** 10/03/1997 **Plug Date:**
Log File Date: 12/01/1997 **PCW Rcv Date:** 03/01/1999 **Source:** Shallow
Pump Type: SUBMER **Pipe Discharge Size:** 1.5 **Estimated Yield:** 30 GPM
Casing Size: 7.00 **Depth Well:** 494 feet **Depth Water:** 305 feet

Water Bearing Stratifications:

Top	Bottom	Description
350	415	Sandstone/Gravel/Conglomerate
418	460	Other/Unknown
461	481	Other/Unknown

Casing Perforations:

Top	Bottom
350	494

Meter Number: 8472 **Meter Make:** SEAMETRICS
Meter Serial Number: 042018001243 **Meter Multiplier:** 1.0000
Number of Dials: 8 **Meter Type:** Diversion
Unit of Measure: Barrels 42 gal. **Return Flow Percent:**
Usage Multiplier: **Reading Frequency:** Quarterly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
12/11/1999	1999	653040	A	jw		0	
04/04/2000	2000	653040	A	jw		0	
07/03/2000	2000	825869	A	jw		5.304	
12/31/2000	2000	1142618	A	jw		9.721	
03/31/2001	2001	1170037	A	jw		0.841	
06/30/2001	2001	1347781	A	jw		5.455	
09/30/2001	2001	1480212	A	jw		4.064	
12/31/2001	2001	1697970	A	jw		6.683	
03/31/2002	2002	1707596	A	jw		0.295	
07/14/2002	2002	1785094	A	jw		2.378	
09/30/2002	2002	1844508	A	jw		1.823	
01/01/2003	2003	1934739	A	jw		2.769	
03/31/2003	2003	2051807	A	jw		3.593	

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

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
06/30/2003	2003	2197495	A	jw		4.471	
09/30/2003	2003	2346900	A	jw		4.585	
01/01/2004	2004	33991	R	jw	Meter has been replaced	235.908	
04/01/2004	2004	315287	A	jw		8.633	
06/29/2004	2004	585026	A	jw		8.278	
08/16/2004	2004	716546	A	jw		4.036	
09/30/2004	2004	125830	R	jw	New Meter	288.760	
01/01/2005	2005	735508	A	jw		0	
01/18/2005	2005	387193	A	jw		8.021	
04/06/2005	2005	756024	A	jw		0.630	
07/11/2005	2005	170600	A	jw		0	
10/14/2005	2005	363300	A	jw		5.914	
12/29/2005	2005	509100	A	RPT		4.474	
05/16/2006	2006	793630	A	RPT		8.732	
08/05/2006	2006	1071018	A	RPT		8.513	
10/31/2006	2006	1380530	A	RPT		9.499	
01/07/2019	2019	0	A	RPT	New Meter	0	
03/31/2019	2019	105049	A	RPT		13.540	
07/01/2019	2019	175266	A	RPT		9.051	
10/01/2019	2019	266350	A	RPT		11.740	
01/07/2020	2019	266350	A	RPT		0	
04/01/2020	2020	335809	A	RPT		8.953	
07/02/2020	2020	430850	A	RPT		12.250	
10/09/2020	2020	430850	A	RPT		0	
01/07/2021	2020	553593	A	WEB		15.821	X

**YTD Meter Amounts:	Year	Amount
	1999	0
	2000	15.025
	2001	17.043
	2002	4.496
	2003	15.418
	2004	545.615
	2005	19.039
	2006	26.744
	2019	34.331
	2020	37.024

New Mexico Office of the State Engineer
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 Number	Q64	Q16	Q4	Sec	Twn	Rng	X	Y
NA	CP 01502 POD1	4	3	3	05	23S	34E	641316	3577635

Driller License: 1626 **Driller Company:** TAYLOR, ROY ALLEN

Driller Name: TAYLOR, ROY A.

Drill Start Date: 08/10/2017 **Drill Finish Date:** 08/19/2017 **Plug Date:**

Log File Date: 09/06/2017 **PCW Rcv Date:** 02/07/2019 **Source:** Shallow

Pump Type: SUBMER **Pipe Discharge Size:** 3 **Estimated Yield:** 100 GPM

Casing Size: 10.00 **Depth Well:** 648 feet **Depth Water:** 200 feet

Water Bearing Stratifications:	Top	Bottom	Description
	17	207	Sandstone/Gravel/Conglomerate
	219	257	Sandstone/Gravel/Conglomerate
	261	375	Sandstone/Gravel/Conglomerate
	630	646	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	225	648

Meter Number: 17821 **Meter Make:** TURBINES INC

Meter Serial Number: 1645755 **Meter Multiplier:** 1.0000

Number of Dials: 7 **Meter Type:** Diversion

Unit of Measure: Barrels 42 gal. **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Monthly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
11/01/2018	2018	803307	A	RPT		0	
06/01/2020	2020	1767143	A	RPT		124.232	
07/01/2020	2020	1767143	A	ca		0	
09/01/2020	2020	1806080	A	RPT	This is not an approved meter	5.019	
10/01/2020	2020	1808538	A	RPT		0.317	
12/01/2020	2020	1823042	A	RPT		1.869	
01/01/2021	2020	1832918	A	RPT		1.273	
02/01/2021	2021	1832918	A	RPT		0	
03/01/2021	2021	1846831	A	RPT		1.793	
06/01/2021	2021	1911738	A	ad		8.366	

**YTD Meter Amounts:	Year	Amount
	2018	0
	2020	132.710
	2021	10.159

8/25/21 6:46 AM POINT OF DIVERSION SUMMARY

New Mexico Office of the State Engineer
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 Number	Q64	Q16	Q4	Sec	Twn	Rng	X	Y
NA	CP 01502 POD2	4	3	3	05	23S	34E	642074	3577676

Driller License: 1626 **Driller Company:** TAYLOR, ROY ALLEN

Driller Name: TAYLOR, ROY A.

Drill Start Date: 11/22/2017 **Drill Finish Date:** 12/09/2017 **Plug Date:**

Log File Date: 12/21/2017 **PCW Rcv Date:** 02/07/2019 **Source:** Shallow

Pump Type: SUBMER **Pipe Discharge Size:** 3 **Estimated Yield:** 100 GPM

Casing Size: 9.58 **Depth Well:** 680 feet **Depth Water:** 300 feet

Water Bearing Stratifications:

Top	Bottom	Description
225	377	Sandstone/Gravel/Conglomerate
391	478	Sandstone/Gravel/Conglomerate
489	674	Sandstone/Gravel/Conglomerate

Casing Perforations:

Top	Bottom
225	680

Meter Number: 17822 **Meter Make:** TURBINES INC

Meter Serial Number: 1721046 **Meter Multiplier:** 1.0000

Number of Dials: 7 **Meter Type:** Diversion

Unit of Measure: Barrels 42 gal. **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Monthly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
11/01/2018	2018	1187267	A	RPT		0	
06/01/2020	2020	2859834	A	RPT		215.583	
07/01/2020	2020	2926718	A	RPT		8.621	
09/01/2020	2020	3051907	A	RPT	Not an Approved Meter	16.136	
10/01/2020	2020	3141874	A	RPT		11.596	
11/01/2020	2020	3238147	A	RPT		12.409	
12/01/2020	2020	3300990	A	RPT		8.100	
01/01/2021	2020	3359045	A	RPT		7.483	
02/01/2021	2021	3435195	A	RPT		9.815	
03/01/2021	2021	3511183	A	RPT		9.794	

****YTD Meter Amounts:**

Year	Amount
2018	0
2020	279.928
2021	19.609

New Mexico Office of the State Engineer
Wells with Well Log Information

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right)

(R=POD has been replaced, O=orphaned, C=the file is closed)

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

(NAD83 UTM in meters)

(in feet)

POD Number	Code	POD Subbasin	County	Source	q 64	q 16	q 4	Sec	Twn	Rng	X	Y	Distance	Start Date	Finish Date	Log File Date	Depth Well	Depth Water	Driller	License Number
CP 00556 POD1		CP	LE	Shallow	4	4	3	08	23S	34E	641762	3576206	403	09/27/1974	10/17/1974	10/25/1974	497	255	ABBOTT, MURRELL	46
CP 01075 POD1		CP	LE	Shallow	1	1	1	08	23S	34E	641278	3577525	1026	05/21/2012	05/26/2012	06/08/2012	430	20	NORRIS, JOHN D.	1682
CP 00872 POD1		CP	LE	Shallow	1	1	1	08	23S	34E	641225	3577504*	1032	09/29/1997	10/03/1997	12/01/1997	494	305	COLLIS, ROBERT E.	1184
CP 01502 POD1		CP	LE	Shallow	4	3	3	05	23S	34E	641316	3577635	1110	08/10/2017	08/19/2017	09/06/2017	648	200	TAYLOR, ROY A.	1626
CP 01502 POD2		CP	LE	Shallow	4	3	3	05	23S	34E	642074	3577676	1118	11/22/2017	12/09/2017	12/21/2017	680	300	TAYLOR, ROY A.	1626
CP 01130 POD2		CP	LE		2	1	2	07	23S	34E	640674	3577549	1421	12/19/2012	12/19/2012	12/31/2012	27			1478
CP 01130 POD1		CP	LE		2	1	2	07	23S	34E	640662	3577558	1436	12/19/2012	12/19/2012	12/31/2012	27			1478
CP 01622 POD1		CP	LE	Shallow	1	3	3	04	23S	34E	642830	3577872	1667	09/20/2019	10/02/2019	10/17/2019	575	285	BRYCE WALLACE	1706
CP 01730 POD1		CP	LE	Artesian	2	2	1	16	23S	34E	643549	3575824	1971	10/31/2018	11/05/2018	12/13/2018	594	200	WALLACE, BRYCE J.	1706
CP 01760 POD1		CP	LE	Artesian	3	1	2	16	23S	34E	643627	3575897	2016	02/01/2020	03/15/2020	04/09/2020	767	290	WALLACE, BRYCE J.LEE.NER	1706
C 04353 POD1		CUB	ED	Shallow	4	2	2	24	23S	33E	639474	3574098	3382	11/04/2019	11/13/2019	01/29/2020	603	330	JUSTIN MULLINS	1737
CP 01829 POD1		CP	LE	Artesian	4	4	2	32	22S	34E	642559	3580172	3655	08/25/2020	10/31/2020	11/17/2020	1410	1150	WALLACE, BRYCE J.LEE.NER	1706
CP 01705 POD1		CP	LE	Shallow	4	4	2	32	22S	34E	642588	3580179	3668	04/02/2018	05/01/2018	05/23/2018	700	305	KEY, CASEY	1058
CP 01706 POD1		CP	LE	Shallow	4	4	2	32	22S	34E	642603	3580185	3678	01/06/2020	01/07/2020	01/13/2020	340	282	BRYCE WALLACE	1706
CP 00637		CP	LE	Shallow	3	3	4	15	23S	34E	645293	3574541*	4110	07/06/1981	07/09/1981	07/16/1981	430	430	WHEELER, RONALD R	729
CP 01258 POD1		CP	LE		1	4	3	22	23S	34E	645015	3573221	4711	12/04/2013	12/04/2013	12/23/2013	25		BRYAN, EDWARD (LD)	1711
E 07616 POD1		E	TO	Shallow							646466	3576970	4739	08/10/1999	08/20/2000	12/07/2000	500	300	GARCIA, RAYMOND, JR.	539
CP 01785 POD1		CP	LE	Shallow	4	1	3	14	23S	34E	646203	3575003	4742	04/21/2019	04/23/2019	06/03/2019	488	245	WALLACE, BRYCE J.LEE.NER	1706
CP 01258 POD3		CP	LE		1	4	3	22	23S	34E	644938	3573097	4749	12/04/2013	12/04/2013	12/23/2013	25		BRYAN, EDWARD (LD)	1711
CP 01258 POD2		CP	LE		1	4	3	22	23S	34E	644941	3572883	4911	12/04/2013	12/04/2013	12/23/2013	65		BRYAN, EDWARD (LD)	1711
CP 01803 POD1		CP	LE	Shallow	1	1	1	34	22S	34E	644357	3580786	4928	11/04/2019	11/06/2019	02/03/2020	240	180	WALLACE, BRYCE J.LEE.NER	1706
CP 01826 POD1		CP	LE	Artesian	1	1	1	34	22S	34E	644379	3580778	4933	12/12/2019	05/20/2020	06/22/2020	698	180	BRYCE WALLACE	1706
CP 01740 POD1		CP	LE	Artesian	1	1	1	34	22S	34E	644402	3580765	4935	03/15/2019	09/26/2019	10/17/2019	600	560	BRYCE WALLCE	1706
CP 01120 POD1		CP	LE	Shallow	2	3	3	14	23S	34E	646366	3574753	4984	01/09/2013	04/06/2013	04/24/2013	397	318	BENTLE, BILLY L.	1292

Record Count: 24

UTMNAD83 Radius Search (in meters):

Easting (X): 641740.64 **Northing (Y):** 3576609.38 **Radius:** 5000

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

Attachment D

Closure Criteria Research

U.S. Fish and Wildlife Service

National Wetlands Inventory

4-15 SWD - Riverine 4,111.2 ft.

June 18, 2021

Wetlands

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

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

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

U.S. Fish and Wildlife Service

National Wetlands Inventory

4-15 SWD - FW Pond 10,365.5 ft.

June 18, 2021

Wetlands

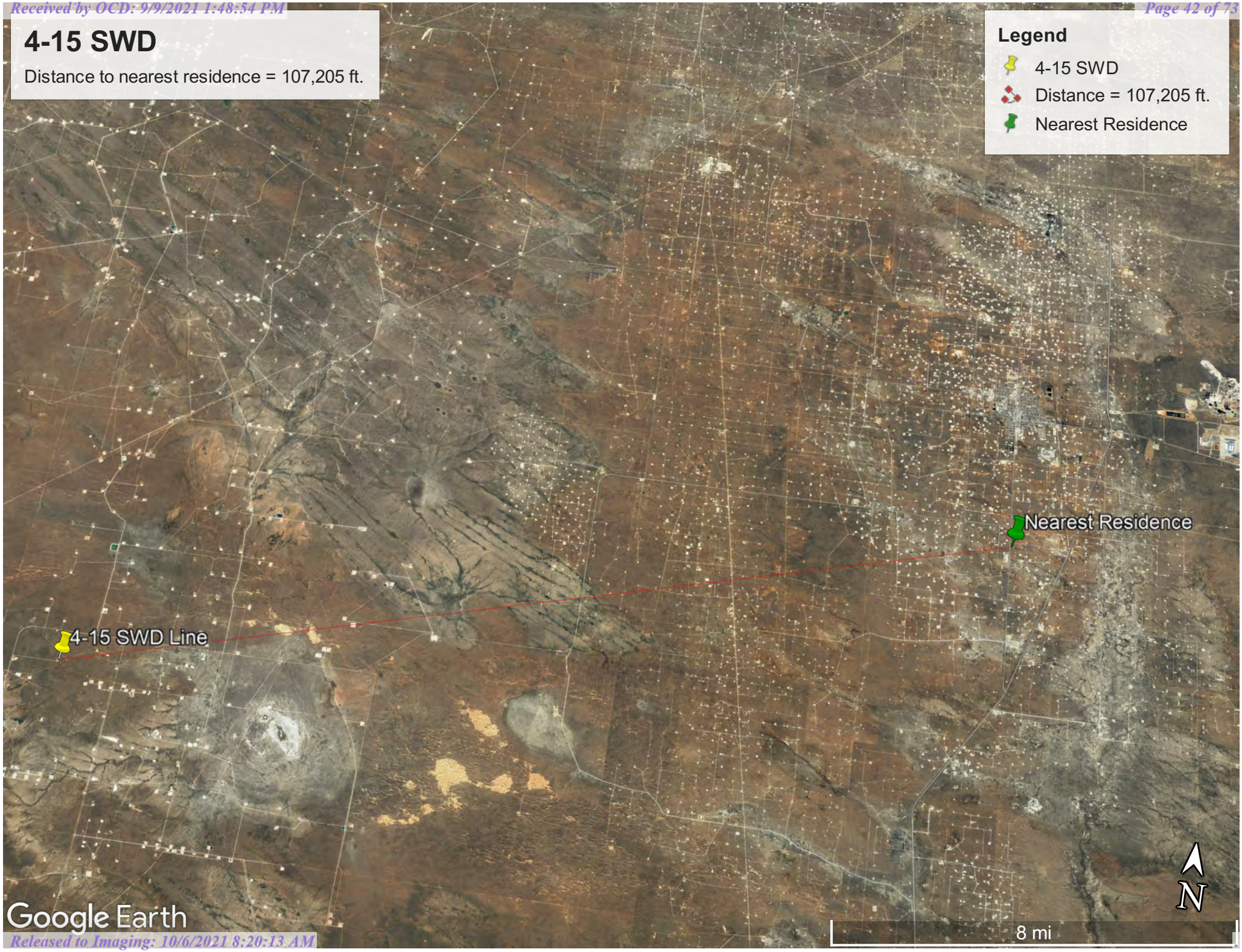
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

4-15 SWD

Distance to nearest residence = 107,205 ft.



U.S. Fish and Wildlife Service

National Wetlands Inventory

4-15 SWD - Wetland 4,561.6 ft.

June 18, 2021

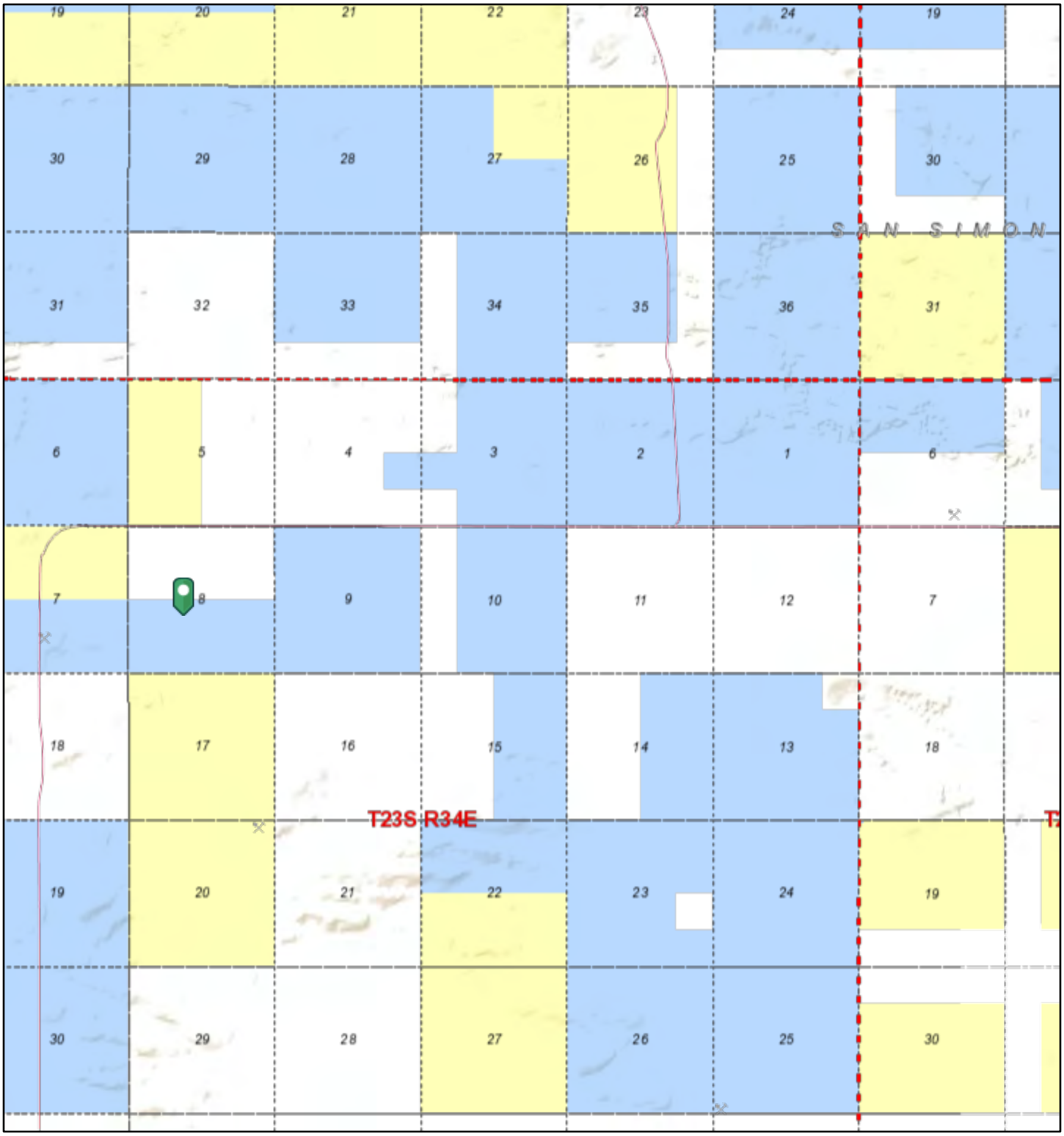
Wetlands

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

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

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

Active Mines Near 4-15 SWD



6/18/2021, 10:46:15 AM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Township / Range
Sections

Land Ownership
Bureau of Land Management
Bureau of Reclamation
Department of Agriculture
Department of Defense
Department of Energy
National Park Service
Private Land
State Game and Fish
State Land
State Parks
Tribal

U.S. Bureau of Land Management - New Mexico State Office, Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS

EMNRD MMD GIS Coordinator

National Flood Hazard Layer FIRMette

FEMA

103°29'59"W 32°19'18"N

103°29'22"W 32°18'48"N

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

1:6,000

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

Legend

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

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

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

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

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

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 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 6/18/2021 at 12:52 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.

Attachment E

Karst Map

4-15 SWD

Karst Potential = Low

Attachment F

VSP Sampling Plan

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary

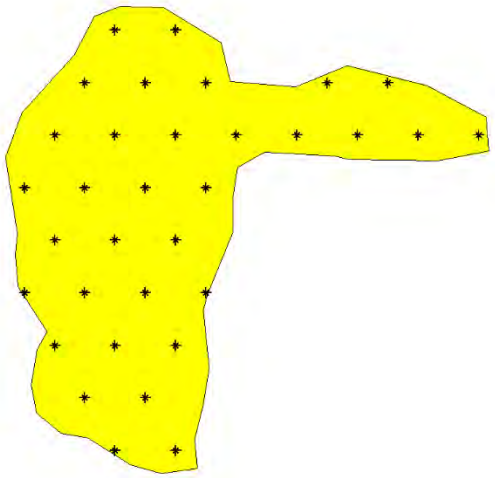
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated number of samples	22
Number of samples adjusted for EMC	22
Number of samples with MARSSIM Overage	27
Number of samples on map [a]	33
Number of selected sample areas [b]	1
Specified sampling area [c]	20101.12 ft^2
Size of grid / Area of grid cell [d]	27.1481 feet / 638.277 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid gives the linear and square dimensions of the grid used to systematically place samples. If there was more than one sample area, this represents the largest dimensions used.

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



Area: Area 1						
X Coord	Y Coord	Label	Value	Type	Historical	Sample Area
2105272.6258	11734242.4905			Systematic		
2105299.7739	11734242.4905			Systematic		
2105259.0518	11734266.0014			Systematic		
2105286.1998	11734266.0014			Systematic		
2105245.4777	11734289.5124			Systematic		
2105272.6258	11734289.5124			Systematic		
2105299.7739	11734289.5124			Systematic		
2105231.9037	11734313.0233			Systematic		
2105259.0518	11734313.0233			Systematic		
2105286.1998	11734313.0233			Systematic		
2105313.3479	11734313.0233			Systematic		
2105245.4777	11734336.5342			Systematic		
2105272.6258	11734336.5342			Systematic		
2105299.7739	11734336.5342			Systematic		
2105231.9037	11734360.0451			Systematic		
2105259.0518	11734360.0451			Systematic		
2105286.1998	11734360.0451			Systematic		
2105313.3479	11734360.0451			Systematic		
2105245.4777	11734383.5561			Systematic		
2105272.6258	11734383.5561			Systematic		
2105299.7739	11734383.5561			Systematic		
2105326.9220	11734383.5561			Systematic		
2105354.0700	11734383.5561			Systematic		
2105381.2181	11734383.5561			Systematic		
2105408.3662	11734383.5561			Systematic		
2105435.5143	11734383.5561			Systematic		
2105259.0518	11734407.0670			Systematic		

2105286.1998	11734407.0670			Systematic		
2105313.3479	11734407.0670			Systematic		
2105367.6441	11734407.0670			Systematic		
2105394.7922	11734407.0670			Systematic		
2105272.6258	11734430.5779			Systematic		
2105299.7739	11734430.5779			Systematic		

Primary Sampling Objective
The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach
A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

VSP offers many options to determine the locations at which measurements are made or samples are collected and subsequently measured. For this design, systematic grid point sampling was chosen. Locating the sample points systematically provides data that are all equidistant apart. This approach does not provide as much information about the spatial structure of the potential contamination as simple random sampling does. Knowledge of the spatial structure is useful for geostatistical analysis. However, it ensures that all portions of the site are equally represented. Statistical analyses of systematically collected data are valid if a random start to the grid is used.

Number of Total Samples: Calculation Equation and Inputs
The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{S_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

For each nuclide in the table, the values of these inputs that result in the calculated number of sampling locations are:

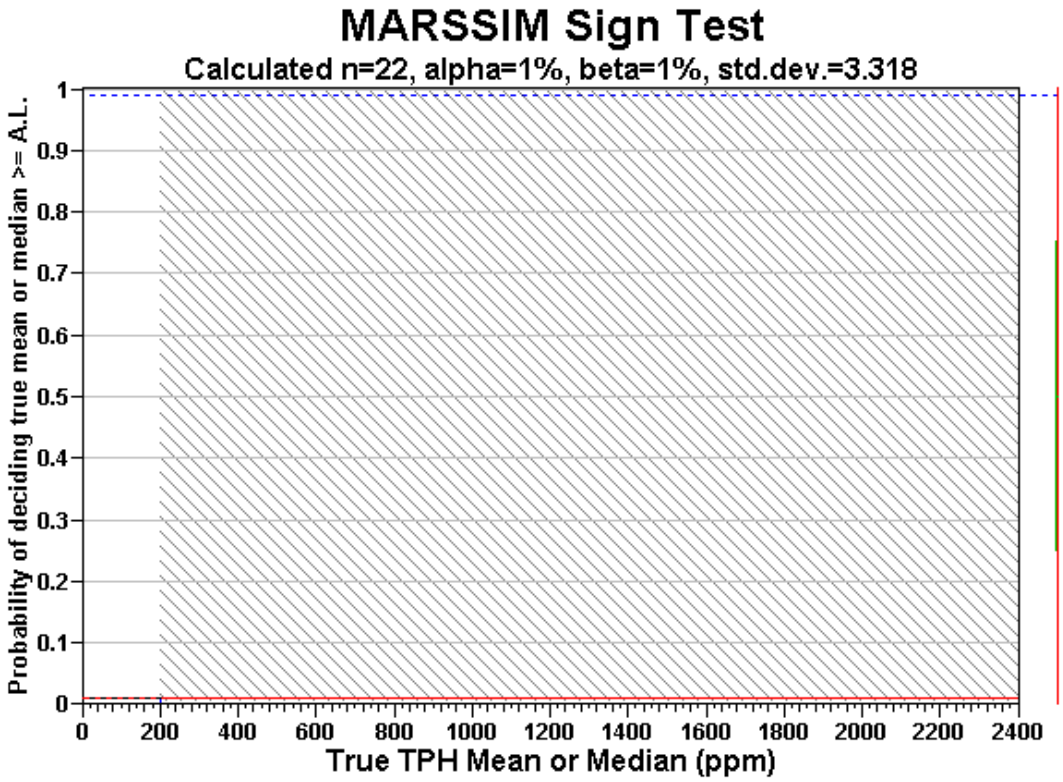
Nuclide	n[a]	n[b]	n[c]	Parameter					
				S_{total}	Δ	α	β	$Z_{1-\alpha}$ [d]	$Z_{1-\beta}$ [e]
TPH	22	22	27	3.318	2300	0.01	0.01	2.32635	2.32635
Chloride	22	22	27	4.66	19313	0.01	0.01	2.32635	2.32635
BTEX	0	0	0						
Benzene	0	0	0						

[a] The number of samples calculated by the formula.
[b] The number of samples increased by EMC calculations.
[c] The final number of samples increased by the MARSSIM Overage of 20%.
[d] This value is automatically calculated by VSP based upon the user defined value of α.
[e] This value is automatically calculated by VSP based upon the user defined value of β.

Performance
The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at $1-\alpha$ on the vertical axis; the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at $1-\alpha$. If any of the inputs change, the number of samples that result in the correct curve changes.

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected probabilistically.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the gridded sample locations were selected based on a random start.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that $\mu >$ action level and alpha (%), probability of mistakenly concluding that $\mu <$ action level. The following table shows the results of this analysis.

Number of Samples							
AL=20000		α=5		α=10		α=15	
		s=6.636	s=3.318	s=6.636	s=3.318	s=6.636	s=3.318
LBGR=90	β=5	14	14	11	11	10	10
	β=10	11	11	9	9	8	8
	β=15	10	10	8	8	6	6
LBGR=80	β=5	14	14	11	11	10	10
	β=10	11	11	9	9	8	8
	β=15	10	10	8	8	6	6

North Bell Lake 4-15 SWD
Incident ID: NAPP2116429491

LBGR=70	**β=5**	14	14	11	11	10	10
	β=10	11	11	9	9	8	8
	β=15	10	10	8	8	6	6

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that μ > action level
α = Alpha (%), Probability of mistakenly concluding that μ < action level
AL = Action Level (Threshold)

Note: Values in table are not adjusted for EMC.

Total Dose Calculation
The total dose from all sources was calculated based on the user-entered values below.

Total Dose From All Sources		
Area	**Average**	**DCGL**
Survey Unit	0	10
Total Dose Sum of Fractions:		0
Total dose from all sources is below release criteria. 0 < 1		

This report was automatically produced* by Visual Sample Plan (VSP) software version 7.15.
This design was last modified 8/19/2021 1:06:31 PM.
Software and documentation available at http://vsp.pnnl.gov

* - The report contents may have been modified or reformatted by end-user of software.

Attachment G

USDA Custom Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Lea County, New Mexico

4-15 SWD - 6.12.2021 Spill

August 19, 2021

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map (4-15 SWD - 6.12.2021 Spill)

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 17, Jun 8, 2020

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 (4-15 SWD - 6.12.2021 Spill)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PU	Pyote and Maljamar fine sands	1.1	100.0%
Totals for Area of Interest		**1.1**	**100.0%**

Map Unit Descriptions (4-15 SWD - 6.12.2021 Spill)

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

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

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

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

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Lea County, New Mexico

PU—Pyote and Maljamar fine sands

Map Unit Setting

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

Map Unit Composition

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

Description of Pyote

Setting

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

Typical profile

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

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Description of Maljamar

Setting

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

Typical profile

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

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 10 percent
Ecological site: R042XC022NM - Sandhills
Hydric soil rating: No

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4-15 SWD

Karst Potential = Low

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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 47446

CONDITIONS

Operator: KAISER-FRANCIS OIL CO P.O. Box 21468 Tulsa, OK 74121	OGRID: 12361
	Action Number: 47446
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
chensley	None	10/6/2021