TETRA TECH

November 16, 2023

Tami Knight, CHMM
Environmental Specialist SRD-ECO
New Mexico State Land Office
1300 W. Broadway Avenue, Suite A
Bloomfield, NM 87413
(505) 670.1639
tknight@slo.state.nm.us

Re: Release Characterization and Remediation Work Plan
Oriole State Com #001 Flowline Release
ConocoPhillips
Lea County, New Mexico
DOR: 9/06/23
INCIDENT ID: NAPP2326829702
Approximate Release Point 32.713645° -103.538223°
Landowner: Private Agricultural Lease (Pearce Trust) / State Trust Land

Ms. Knight:

Tetra Tech, Inc. (Tetra Tech) was contacted by ConocoPhillips (COP) to evaluate and assess a release that occurred from a flowline associated with the Oriole State Com #001 (API# 30-025-41612). The release footprint is located on State Trust Land in Public Land Survey System (PLSS) Unit Letter M, Section 26, Township 18 South, Range 34 East, in Lea County, New Mexico (Site). The approximate release point occurred at coordinates 32.713647°-103.538222°, as shown on Figures 1 and 2.

BACKGROUND

According to information provided, the release was caused by internal corrosion in a fitting resulting in the release of 1.88 barrels (bbls) of produced water in an off-pad pasture area. The spill calculator provided with the C-141 indicates a release extent of approximately 1,692 square feet in area. The release extent was identified based on information provided by ConocoPhillips representatives, a review of photographs from the release area, and a Site visit conducted by Tetra Tech personnel as indicated on Figure 3. This release footprint is located on State Trust Land. The New Mexico Oil Conservation Division (NMOCD) received the C-141 report form for the release on September 25, 2023, and subsequently assigned the release Incident ID NAPP2326829702. A copy of the C-141 is included in Appendix A.

COP plans to remediate this release in accordance with NMOCD regulations within the allotted time frame provided by the NMOCD. This Work Plan is hereby presented to the NMSLO based on correspondence with the Environmental Compliance Office for the remediation and reclamation of the release site.

LAND OWNERSHIP

According to the NMOCD Oil and Gas Map, the site is located on State Trust Land managed by the NMSLO. A review of the New Mexico State Land Office Land Status Map was completed, and the release site is located within active oil and gas lease L036740002, under EOG Resources Inc. Based on guidance provided by the NMSLO, as the release footprint is located on an active oil and gas lease, and the footprint

is wholly located within the boundaries of the active oil and gas lease, no Remediation Right of Entry (ROE) is required at the Site.

Please note ConocoPhillips has a Surface Use Agreement (SUA) in place between the Pearce Trust that has been effective as of February 1, 2014. The Oriole State Com #001 Flowline Release footprint is within the boundaries of the agreement.

CULTURAL PROPERTIES PROTECTION

Tetra Tech, on behalf of ConocoPhillips, contracted SWCA Environmental Consultants (SWCA) to conduct an Archeological Resources Management Section (ARMS) review in the release area to comply with 19.2.24 NMAC. On September 27, 2023, SWCA completed a literature and file search using the State of New Mexico's New Mexico Cultural Resources Information System online database which included a review of known historic resources, including the built environment, archaeological sites, and State/National Register listed properties.

In the review, SWCA found the area surrounding the site footprint (radius of 500 meters) has been subject to four (4) cultural resource surveys, three (3) of which are qualifying. One previously recorded site with two LA numbers is located within the project area. The project area is entirely located on NMSLO-managed lands within LA 178082 and LA 191722. LA 178082 was last recorded on 7/28/2023 under NMCRIS Activity No. 153645. LA 191722 was last recorded on 7/26/2018 under NMCRIS Activity No. 141048. Both LA numbers are for the Hobbs Air Force Base Auxiliary Field #4, a World War II airstrip composed of concrete runways. Because the spill is within these cultural resource boundaries, SWCA consulted with the NMSLO on 9/21/2023 and confirmed that the completion of an ARMS letter will satisfy the requirements for release remediation.

All remediation work will remain outside of the concrete runways. If cultural materials are identified during ground disturbing activities, work will be stopped and the NMSLO will be contacted. A copy of the ARMS letter is included in Appendix B.

SITE CHARACTERIZATION

A site characterization was performed and no sinkholes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, stream bodies, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the distances specified in 19.15.29 New Mexico Administrative Code (NMAC). The Site is in an area of low karst potential.

A groundwater well search was performed through the New Mexico Office of the State Engineer (NMOSE) system. There are three active water wells within a ½-mile (800-meter) radius of the Site. According to data from one well located approximately 0.20 miles (319 meters) of the Site, the depth to groundwater is 117 feet below ground surface (bgs). The site characterization data is included as Appendix C.

REGULATORY FRAMEWORK

Based upon the release footprint and in accordance with Subsection E of 19.15.29.12 NMAC, per 19.15.29.11 NMAC, the site characterization data was used to determine recommended remedial action levels (RRALs) for benzene, toluene, ethylbenzene, and xylene (collectively referred to as BTEX), total petroleum hydrocarbons (TPH), and chlorides in soil.

Based on the site characterization and in accordance with Table I of 19.15.29.12 NMAC, the proposed RRALs for the Site are as follows:

Constituent	Site RRALs
Chloride	20,000 mg/kg
TPH (GRO+DRO+ORO)	2,500 mg/kg
TPH (GRO+DRO)	1,000 mg/kg
BTEX	50 mg/kg
Benzene	10 mg/kg

Additionally, in accordance with the NMOCD guidance Procedures for Implementation of the Spill Rule (19.15.29 NMAC) (September 6, 2019), the following reclamation requirements for surface soils (0-4 ft bgs) outside of active oil and gas operations are as follows:

Constituent	Reclamation Requirements
Chloride	600 mg/kg
TPH (GRO+DRO+ORO)	100 mg/kg

SITE ASSESSMENT ACTIVITIES

Tetra Tech personnel were onsite to assess the release area on September 29, 2023. Assessment activities included installing seven (7) hand auger borings (AH-1 through AH-7) in the release area to a total depth ranging from 1-1.75 feet below surrounding grade (bgs). Auger refusal was met at roughly 1.75 feet bgs.

Based on the dense subsurface lithology (caprock) beneath the footprint, Tetra Tech remobilized to the site on October 16, 2023, and installed three (3) trenches (T-1 through T-3) using a backhoe to evaluate the vertical extents of the release footprint. Trench T-1 was installed to 5’ ft bgs and trenches T-2 and T-3 were installed to 4’ ft bgs. Sample locations are shown in Figure 3. Photographic documentation of the Site is included in Appendix D.

SAMPLING RESULTS

Results from the September and October 2023 soil sampling events are summarized in Table 1. Analytical results associated with AH-1 through AH-3 and trench locations T-1 throughT-3 exceeded the chloride reclamation requirement of 600 mg/kg in surface soils to 4 feet bgs. All other analytical results from the sampling events were below Site RRALs and reclamation requirements. The release extent is fully delineated, both vertically and horizontally as a result of the soil assessment activities. A copy of the laboratory analytical report and chain-of-custody documentation are included in Appendix E.

REMEDIATION PLAN

Based on the analytical results, ConocoPhillips proposes to remove the impacted material within the release footprint as indicated on Figure 4. Impacted soils in the vicinity of AH-1 through AH-3 and trench locations T-1 through T-3 will be excavated using heavy equipment (backhoes, hoe rams, and track hoes) to a maximum depth of 4 feet below pre-release grade or until a representative sample from the walls and bottom of the excavation is below the applicable reclamation requirements (or RRALs, if applicable). Any area containing pressurized lines will be hand-dug to the proposed depth shown on Figure 4 or to the maximum extent practicable; heavy equipment will come no more than 4 feet from any pressurized lines. The estimated volume of material to be remediated is approximately 385 cubic yards. Excavated soils will be transported offsite and disposed of at an NMOCD-approved or permitted facility.

In accordance with 19.15.29.12(D)(1)(c) NMAC, confirmation floor and sidewall samples will be collected every 200 square feet for verification of remedial activities as indicated in Figure 5, and analyzed for TPH, BTEX, and chlorides. Approximately six (6) confirmation floor samples and eight (8) confirmation sidewall samples are proposed for verification of remedial activities in the proposed excavation area. The proposed excavation encompasses a surface area of approximately 2,838 square feet. Prior to confirmation sampling the NMOCD district office and the NMSLO will be notified via email in accordance with Subsection D of 19.15.29.12 NMAC.

SITE RECLAMATION AND MONITORING PLAN

Based on 19.15.29.13 NMAC, all areas disturbed by the remediation and closure will be reclaimed once confirmation sampling results below the reclamation requirements (or RRALs, respectively, for areas below 4' bgs) are received. Once acceptable confirmation sample results are received, the excavation will be backfilled with clean material to pre-release grade. In accordance with 19.15.29.12 NMAC, the reclaimed area will contain a minimum of four feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0 or Method 4500. The soil cover will include a top layer consisting of one foot of suitable material to establish vegetation at the site.

The backfilled areas in the pasture will be seeded following backfilling, to aid in revegetation. Based on the soils of the site (predominantly KU - Kimbrough-Lea complex), the NMSLO Coarse Sites (CS) Seed Mixture will be used for seeding and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a drill equip with a depth regulator or a hand-held broadcaster and raked. If a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled.

Site inspections will be performed annually to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the NMSLO will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The NMSLO seed mixture details in corresponding pounds per live seed per acre are included in Appendix F.

Reclamation activities will be implemented in consultation with the State Land Office in accordance with 19.2.100.67 NMAC for surface reclamations on State Oil and Gas Leases. COP will notify the NMSLO when reclamation and revegetation are complete.

CONCLUSION

Remediation activities at the Site are proposed to begin immediately upon receipt of NMSLO plan approval. Remediation efforts will meet 19.15.29.13 NMAC closure criteria. Upon completion of the proposed work, a final closure report detailing the remediation activities and the results of the confirmation sampling will be submitted to both NMSLO and NMOCD.

If you have any questions concerning the soil assessment or the proposed remediation activities for the Site, please call me at (512) 338-2861.

Sincerely,
Tetra Tech, Inc.

Lisbeth Chavira
Staff Geoscientist

Christian M. Llull, P.G.
Program Manager

cc:
Mr. Jacob Laird, GPBU - ConocoPhillips

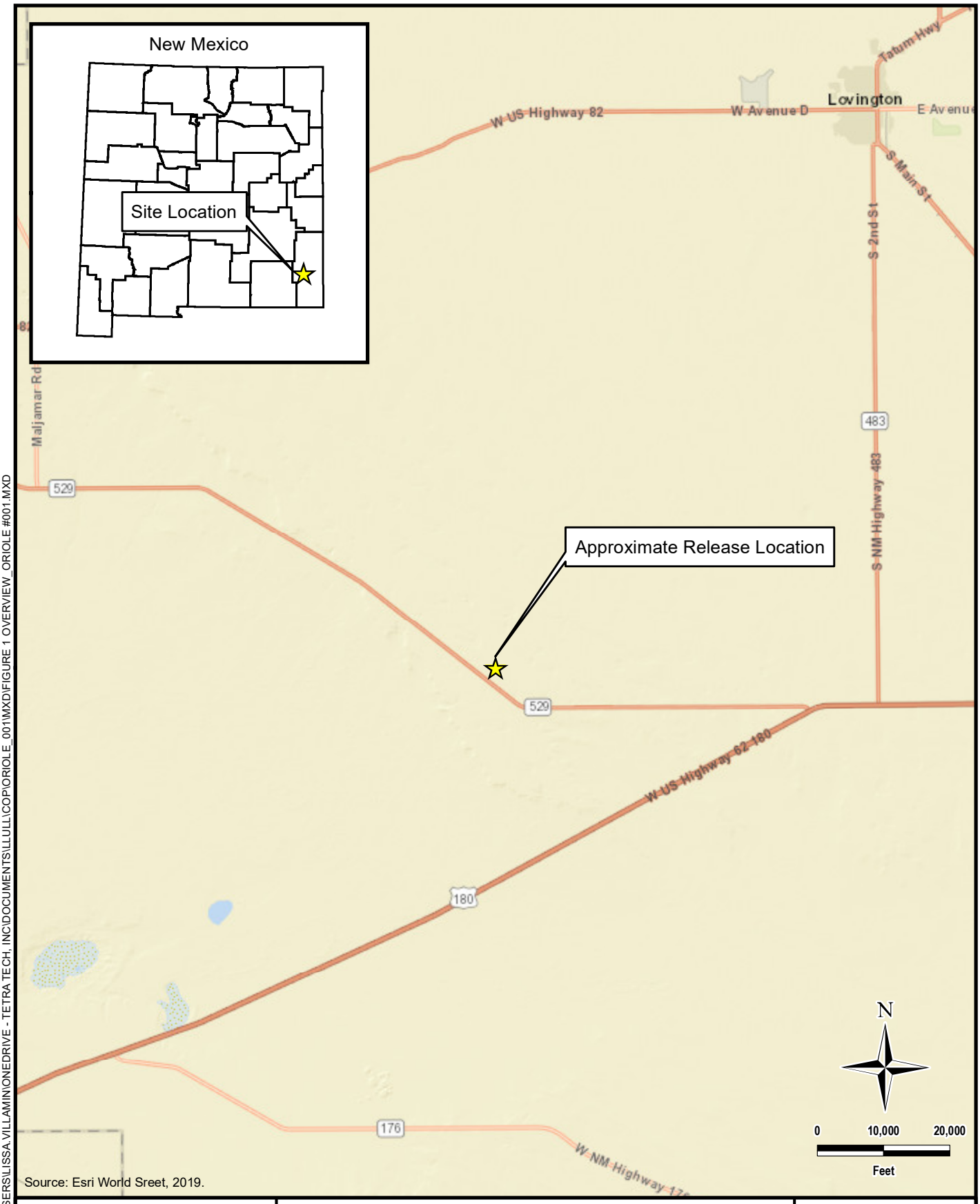
LIST OF ATTACHMENTS

Figures:

Tables:

Appendices:

FIGURES



DOCUMENT PATH: C:\USERS\LISSA.VILLAMIN\ONEDRIVE - TETRA TECH, INC\DOCUMENTS\LLULL\COP\ORIOLE_001\MXD\FIGURE 1 OVERVIEW_ORIOLE #001.MXD

TETRA TECH
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Midland, Texas 79701
Phone: (432) 682-4559
Fax: (432) 682-3946

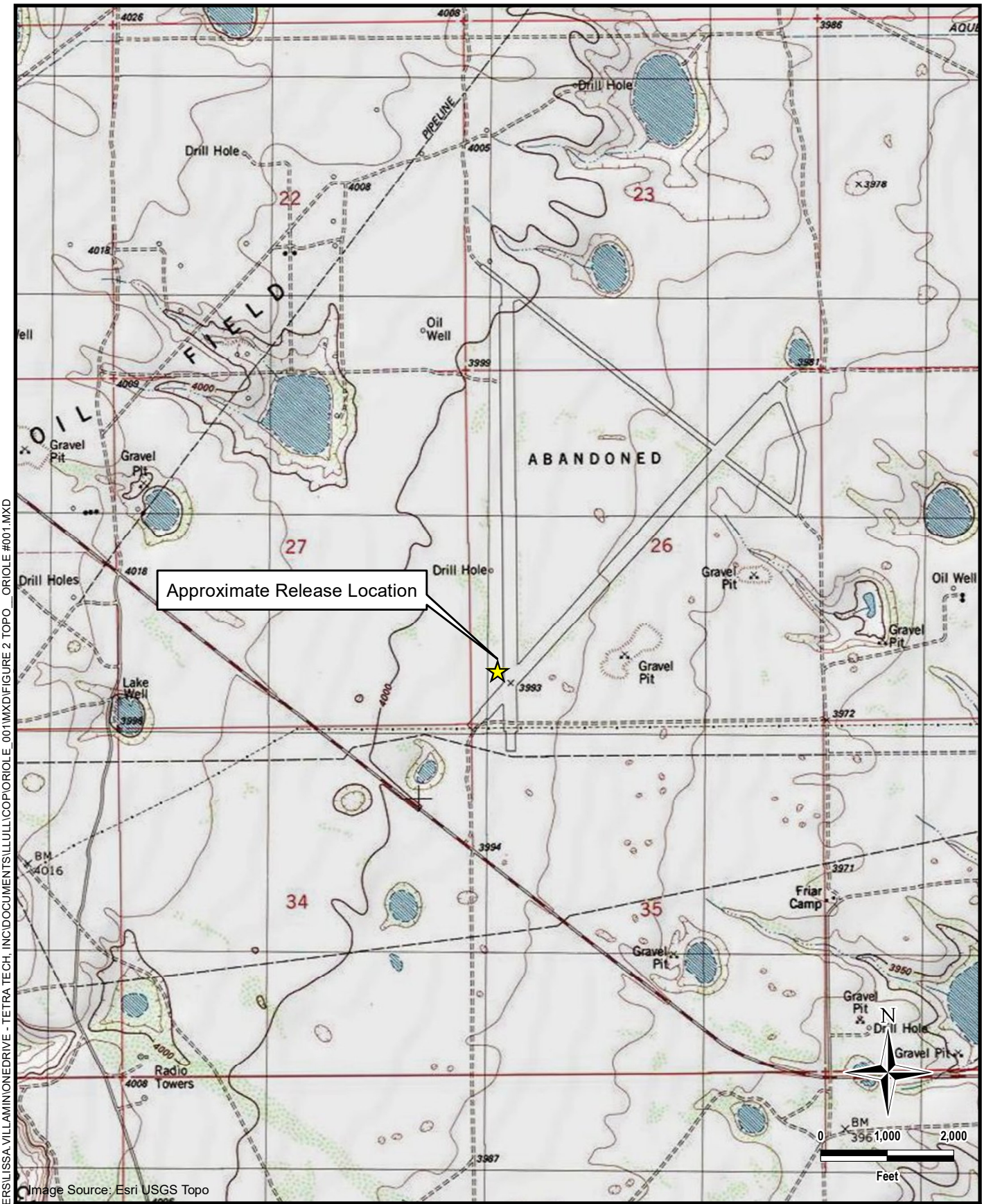
CONOCOPHILLIPS

NMLB1011352696
LEA COUNTY, NEW MEXICO
(32.713647°, -103.538222°)

ORIOLE STATE COM #001 FLOWLINE RELEASE
OVERVIEW MAP

PROJECT NO.:	212C-MD-03236
DATE:	OCTOBER 03, 2023
DESIGNED BY:	LMV

Figure No.
1



DOCUMENT PATH: C:\USERS\LISSA.VILLAMIN\ONEDRIVE - TETRA TECH, INC\DOCUMENTS\LLULL\COP\ORIOLE_001\MXD\FIGURE 2 TOPO__ORIOLE #001.MXD

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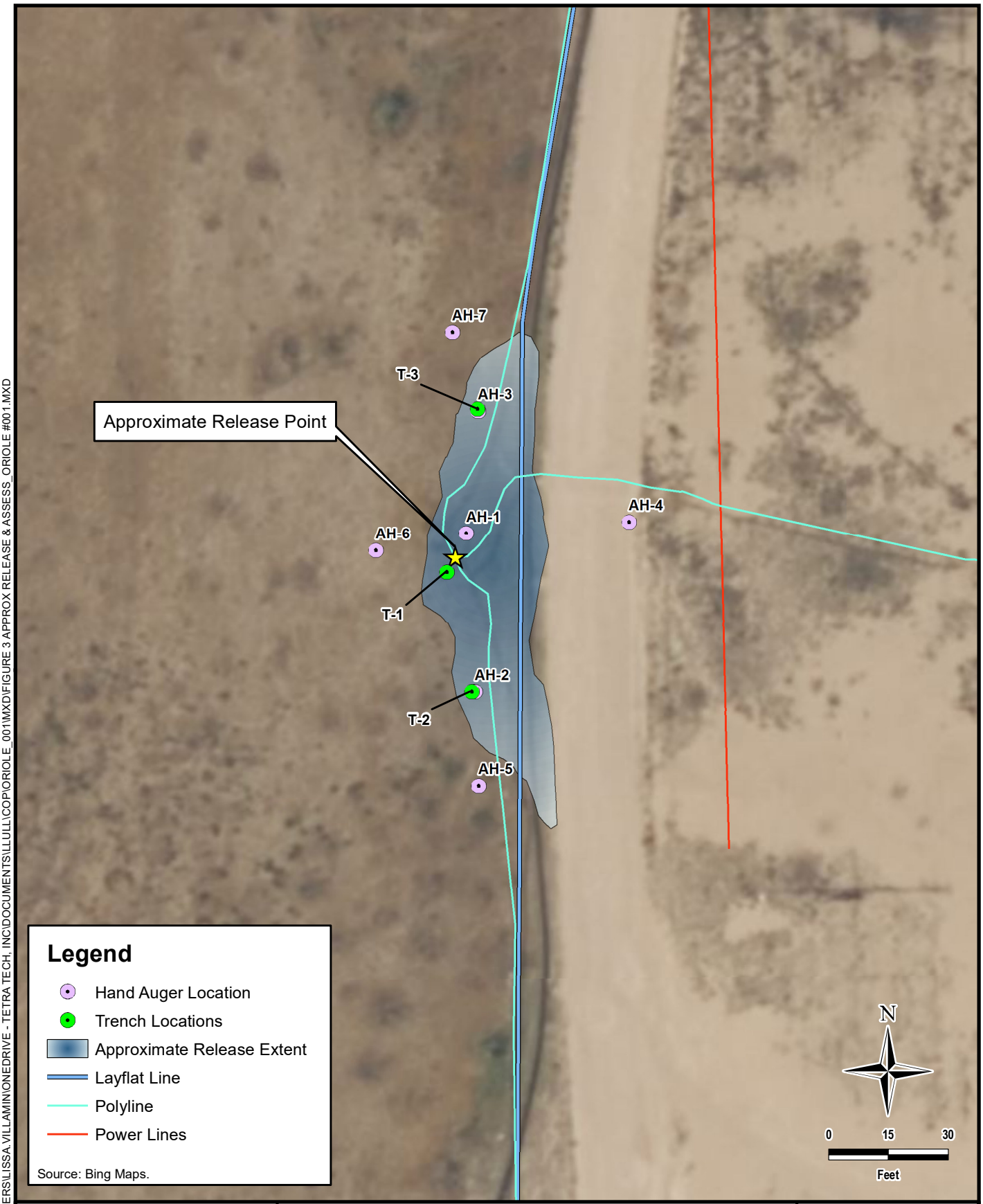
CONOCOPHILLIPS

NMLB1011352696
LEA COUNTY, NEW MEXICO
(32.713647°, -103.538222°)

ORIOLE STATE COM #001 FLOWLINE RELEASE
TOPOGRAPHIC MAP

PROJECT NO.:	212C-MD-03236
DATE:	OCTOBER 03, 2023
DESIGNED BY:	LMV

Figure No.
2



DOCUMENT PATH: C:\USERS\LISSA.VILLAMIN\ONEDRIVE - TETRA TECH, INC\DOCUMENTS\LLULL\COP\ORIOLE_001\MXD\FIGURE 3 APPROX RELEASE & ASSESS_ORIOLE #001.MXD

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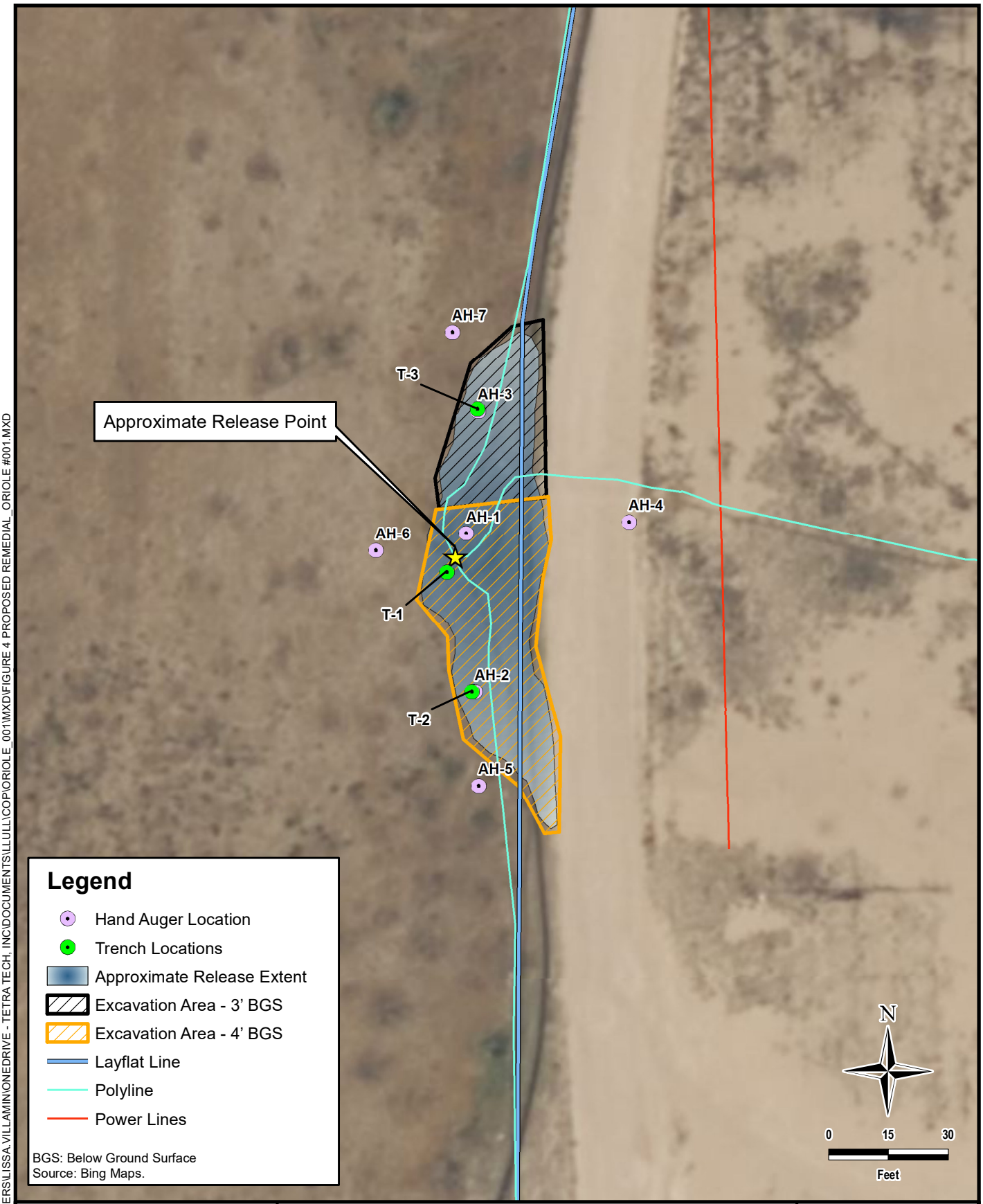
CONOCOPHILLIPS

NMLB1011352696
LEA COUNTY, NEW MEXICO
(32.713647°, -103.538222°)

ORIOLE STATE COM #001 FLOWLINE RELEASE
APPROXIMATE RELEASE EXTENT AND SITE ASSESSMENT

PROJECT NO.:	212C-MD-03236
DATE:	OCTOBER 30, 2023
DESIGNED BY:	LMV

Figure No.
3



DOCUMENT PATH: C:\USERS\LISSA.VILLAMIN\ONEDRIVE - TETRA TECH, INC\DOCUMENTS\LLULL\COP\ORIOLE_001\MXD\FIGURE 4 PROPOSED REMEDIAL_ORIOLE #001.MXD

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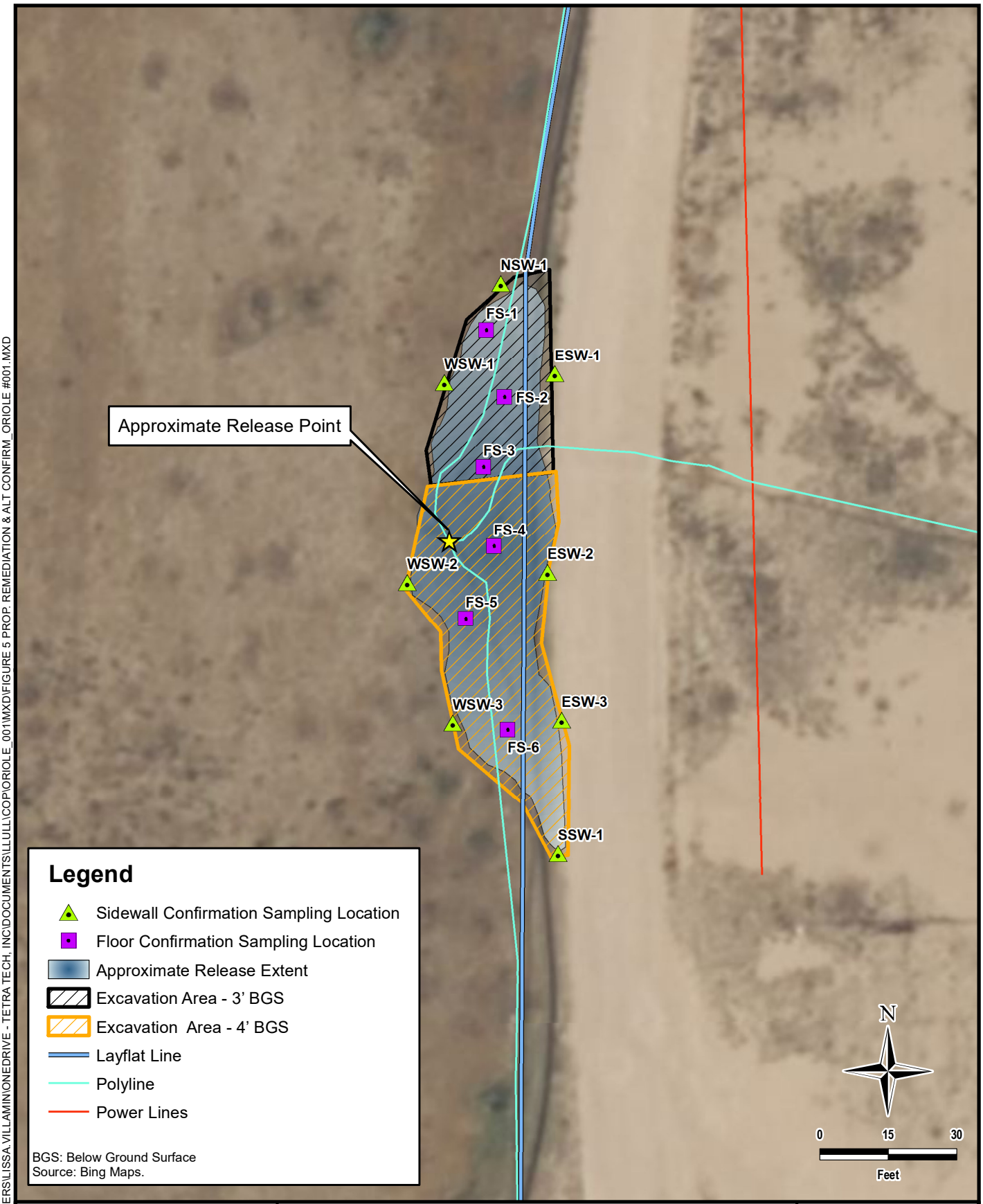
CONOCOPHILLIPS

NMLB1011352696
LEA COUNTY, NEW MEXICO
(32.713647°, -103.538222°)

ORIOLE STATE COM #001 FLOWLINE RELEASE
PROPOSED REMEDIAL EXTENTS

PROJECT NO.:	212C-MD-03236
DATE:	OCTOBER 30, 2023
DESIGNED BY:	LMV

Figure No.
4



DOCUMENT PATH: C:\USERS\LISSA.VILLAMIN\ONEDRIVE - TETRA TECH, INC\DOCUMENTS\LLULL\COP\ORIOLE_001\MXD\FIGURE 5 PROP. REMEDIATION & ALT CONFIRM_ORIOLE #001.MXD

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CONOCOPHILLIPS

NMLB1011352696
LEA COUNTY, NEW MEXICO
(32.713647°, -103.538222°)

ORIOLE STATE COM #001 FLOWLINE RELEASE
PROPOSED REMEDIATION AND ALTERNATIVE CONFIRMATION SAMPLING PLAN

PROJECT NO.:	212C-MD-03236
DATE:	NOVEMBER 10, 2023
DESIGNED BY:	LMV

Figure No.
5

TABLES

TABLE 1
SUMMARY OF ANALYTICAL RESULTS
SOIL ASSESSMENT- nMLB1011352696
CONOCOPHILLIPS
ORIOLE STATE COM #001 FLOWLINE RELEASE
LEA CPUNTY, NM

19.15.29.12 NMAC Closure Criteria for Soils Impacted by a Release (> 100 ft):					Chlorides[1]		BTEX[2]										TPH[3]							
					< 20,000 mg/kg		< 10 mg/kg		Toluene		Ethylbenzene		Total Xylenes		< 50 mg/kg		GRO		DRO		EXT DRO		< 2,500 mg/kg	<1,000 mg/kg
Sample ID	Sample Date	Sample Depth Interval	Field Screening Results		Chloride		Benzene								Total BTEX		C_6 - C_{10}		> C_{10} - C_{28}		> C_{28} - C_{36}		Total TPH (GRO+DRO+EXT DRO)	GRO+DRO
			Chlorides	PID																				
		ft. bgs	ppm		mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	Q	mg/kg	mg/kg
AH-1	9/29/2023	0-1			***6,400***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		1.5-1.75			***8,400***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
T-1	10/16/2023	0-1			***7,440***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		2-3			***3,920***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		3-4			***2,280***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		4-5			384		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-2/ T2	9/29/2023	0-1			***7,200***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
	10/16/2023	2-3			***2,400***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		3-4			***992***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-3/ T3	9/29/2023	0-1			***1,540***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		15.5		<10.0		15.5	15.5
		1.5-1.75			***3,400***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		10.7		<10.0		10.7	10.7
	10/16/2023	2-3			***1,020***		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
		3-4			544		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-4	9/29/2023	0-1			32.0		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-5	9/29/2023	0-1			32.0		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-6	9/29/2023	0-1			48.0		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		-	-
AH-7	9/29/2023	0-1			32.0		<0.050		<0.050		<0.050		<0.150		<0.300		<10.0		<10.0		<10.0		10.1	10.1

NOTES:

ft. Feet
bgs Below ground surface
mg/kg Milligrams per kilogram
TPH Total Petroleum Hydrocarbons
GRO Gasoline range organics
DRO Diesel range organics
1 Method SM4500Cl-B
2 Method 8021B
3 Method 8015M

Bold and italicized values indicate exceedance of proposed Remediation RRALs and Reclamation Requirements.

Shaded rows indicate intervals proposed for excavation.

QUALIFIERS:

APPENDIX A
C-141 Forms

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	NAPP2326829702
District RP	
Facility ID	fAPP2203830839
Application ID	

Release Notification

Responsible Party

Responsible Party	COG Operating, LLC.	OGRID	229137
Contact Name	Jacob Laird	Contact Telephone	(575) 703-5482
Contact email	Jacob.Laird@ConocoPhillips.com	Incident # *(assigned by OCD)*	NAPP2326829702
Contact mailing address	600 West Illinois Avenue, Midland, Texas 79701		

Location of Release Source

Latitude 32.7136 Longitude -103.5381

(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Oriole State 001H	Site Type	Flowline
Date Release Discovered	September 6, 2023	API# *(if applicable)*	

Unit Letter	Section	Township	Range	County
M	26	18S	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) 1.88	Volume Recovered (bbls) 0
	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

This release was caused by a pinhole in a swedge due to internal corrosion.
The release was off pad.
Evaluation will be made of the site to determine if we may commence remediation immediately or delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

State of New Mexico
Oil Conservation Division

Incident ID	NAPP2326829702
District RP	
Facility ID	fAPP2203830839
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ■ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

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: Brittany N. Esparza Title: Environmental Technician

Signature: Brittany Esparza Date: 9/25/2023

email: Brittany.Esparza@ConocoPhillips.com Telephone: (432) 221-0398

OCD Only

Received by: Scott Rodgers Date: 09/25/2023

Convert Irregular shape into a series of rectangles	Length (ft.)	Width (ft.)	Average Depth (in.)	On/Off Pad (dropdown)	Soil Spilled-Fluid Saturation (%.)	Estimated volume of each area (bbl.)	Total Estimated Volume of Spill (bbl.)
Rectangle A	45.0	21.0	0.5	Off-Pad	15.02%	7.01	1.05
Rectangle B	24.0	18.0	0.5	Off-Pad	15.02%	3.20	0.48
Rectangle C	21.0	15.0	0.5	Off-Pad	15.02%	2.34	0.35
Rectangle D						0.00	
Rectangle E						0.00	
Rectangle F						0.00	
Rectangle G						0.00	
Rectangle H						0.00	
Rectangle I						0.00	
Rectangle J						0.00	
						Total Subsurface Volume Released:	1.8849

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

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

CONDITIONS

Action 268488

CONDITIONS

Operator: COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701	OGRID: 229137
	Action Number: 268488
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
scott.rodgers	None	9/25/2023

APPENDIX B
ARMS Review Letter

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

7770 Jefferson Street NE, Suite 410
Albuquerque, New Mexico 87109
Tel 505.254.1115 Fax 505.254.1116
www.swca.com

October 4, 2023

TO: Ethan Ortega, Division Director & Archaeologist, New Mexico State Land Office, Santa Fe, New Mexico

FROM: SWCA Environmental Consultants

SUBJECT: Completion of an Archaeological Records Management Section (ARMS) Review for the Oriole St Com 1 Flowline Release Remediation Project on New Mexico State Land Office (SLO) lands in Lea County, NM

Company Ref No: None-Provided

PROJECT DESCRIPTION:

Tetra Tech, Inc. has requested that SWCA Environmental Consultants (SWCA) conduct an Archaeological Resources Management Section (ARMS) review for an inadvertent release in Lea County, New Mexico. The proposed project is located on lands managed by the New Mexico State Land Office (NMSLO) approximately 32.18 kilometers (20 miles) southwest of Lovington, NM in T18S R34E, Section 26.

A literature and file search were conducted on September 27, 2023, using the New Mexico Cultural Resources Information System online database which included a review of known cultural resources, such as the built environment, archaeological sites, and State/National Register listed properties. Other sources reviewed include the BLM GLO Records web site, http://www.glorecords.blm.gov, which include land patent and general land office survey data. As this area was not settled by Spain, land grant records were not reviewed. The review was conducted for the Area of Potential Effect (APE) and 500 meters (0.31 mile) surrounding the APE. The land the proposed project is located on is part of the June 20, 1910: New Mexico Enabling Act (36 Stat. 557) patented on January 17, 1921.

Recommendation:

The project area and surrounding 500 m have been subject to four (4) cultural resource surveys, three (3) of which are qualifying. One previously recorded site with two LA numbers is located within the project area. The project area is entirely located on NMSLO-managed lands within LA 178082 and LA 191722. LA 178082 was last recorded on 7/28/2023 under NMCRIS Activity No. 153645. LA 191722 was last recorded on 7/26/2018 under NMCRIS Activity No. 141048. Both LA numbers are for the Hobbs Air Force Base Auxiliary Field #4, a World War II airstrip composed of concrete runways. Because the spill is within these cultural resource boundaries, SWCA consulted with the NMSLO on 9/21/2023 and confirmed that the completion of an ARMS letter will satisfy the requirements for release remediation. All remediation work will remain outside of the concrete runways. If cultural materials are identified during ground disturbing activities, work must stop and the NMSLO must be contacted.

Information regarding the findings can be found in Tables 1-2 and Figure 1.

Archaeologist
Paisley DeFreese
Attached: (2) Review Results, (1) ARMS Map

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Albuquerque, New Mexico 87109
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Archaeological Resources Management Section (ARMS) Review Results

Table 1. Cultural surveys within 500 meters (0.31 miles) of proposed project.

NMCRIS No.	Performing Organization	Date of Investigation	Acres Surveyed	Sites Visited
28500	Agency for Conservation Archaeology Eastern New Mexico University	6/9/1975	169.7	18
132584	Cibola Research Consultants	1/22/2015	60	2
141048	Lone Mountain Archaeological Services	4/23/2018	29,148.32	247
153645	J. T. Rein Archaeology, LLC.	7/14/2023	118.77	1

Table 2. Cultural resources within 500 meters (0.31 mile) of the proposed project area.

LA No.	Discovering NMCRIS No.	Site Type/Cultural Affiliation and Age	Eligibility	Relationship to APE
178082	129546	Artifact scatter with features/Anglo (A.D. 1944–1966)	Eligible, Criterion D (9/25/2023 No HPD Log No.)	Inside
191722	141048	Feature/Anglo (A.D. 1942–1966)	Unevaluated (2/19/2019 HPD Log No. 109822)	Inside

*Redacted

Figure 1. Screenshot showing location of the Oriole St Com 1 Flowline inadvertent release (white dots) with a 500-m (0.31-mile) buffer area surrounding the location. Previously recorded sites are red and tan polygons. Previously recorded surveys are brown and yellow polygons.

APPENDIX C
Site Characterization Data

National Flood Hazard Layer FIRMette

FEMA

103°32'36"W 32°43'4"N

103°31'59"W 32°42'34"N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

N

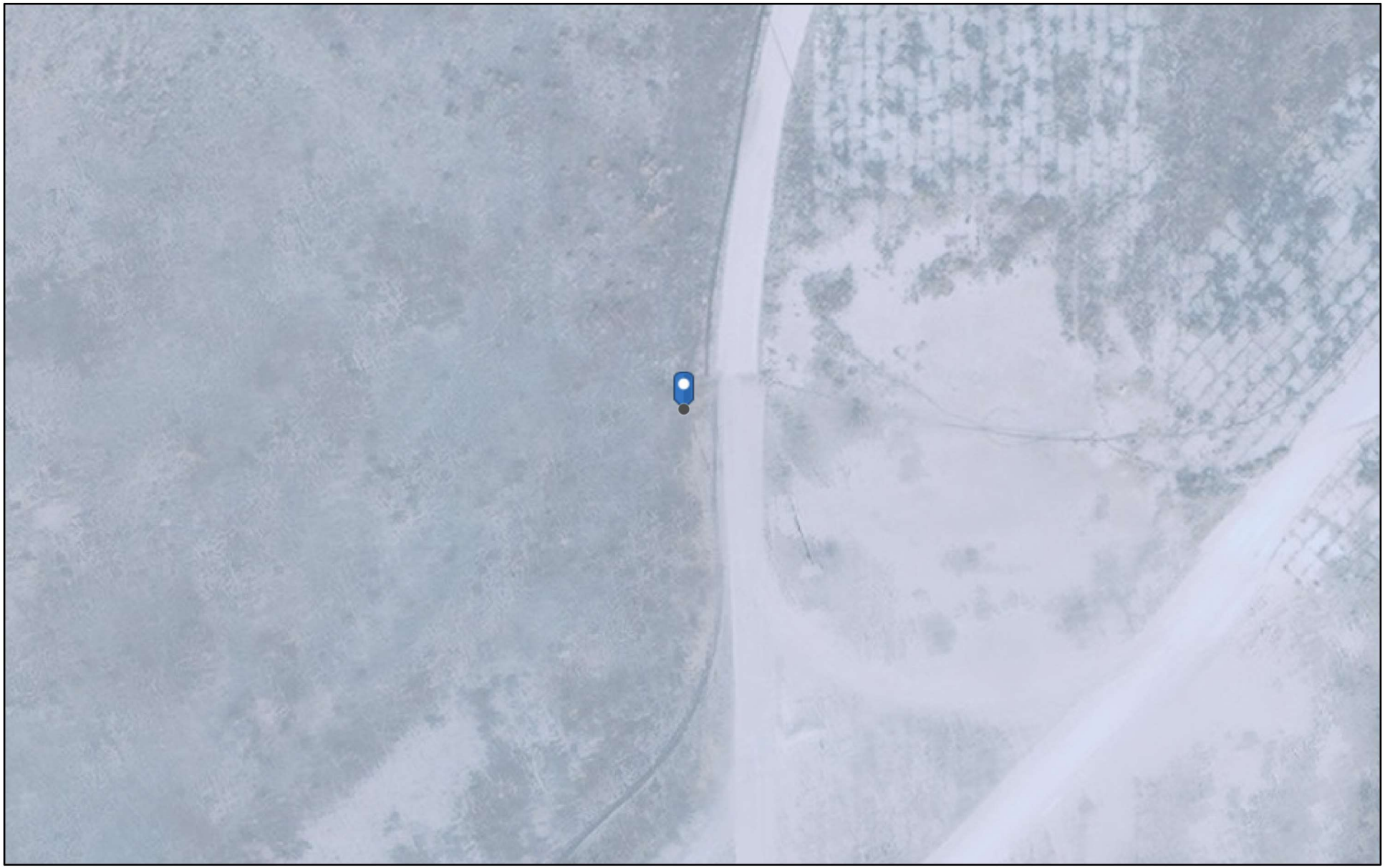
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/22/2023 at 12:20 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.

OCD Karst Potential Map



9/22/2023, 12:08:15 PM

Karst Occurrence Potential

Low

1:1,128

0 0.01 0.01 0.03 mi

0 0.01 0.03 0.05 km

BLM, OCD, New Mexico Tech, Maxar, Microsoft, OCD, Esri, HERE, Garmin, iPC

New Mexico Oil Conservation Division

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

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 12633 POD1	L	LE	2	2	2	34	18S	34E	636852	3620203	319	180	117	63
L 09576	L	LE		1	1	35	18S	34E	637082	3620041*	453	180	130	50
L 14650 POD5	L	LE	4	4	2	27	18S	34E	636738	3621101	667	200	75	125

Average Depth to Water: **107 feet**

Minimum Depth: **75 feet**

Maximum Depth: **130 feet**

Record Count: 3

UTMNAD83 Radius Search (in meters):

Easting (X): 636998.82 **Northing (Y):** 3620487.14 **Radius:** 800

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

OCD - Mineral and Surface Ownership

9/22/2023, 12:10:30 PM

1:1,128

0 0.01 0.01 0.03 mi

0 0.01 0.03 0.05 km

U.S. BLM, Maxar, Microsoft, OCD, Esri, HERE, Garmin, iPC

Mineral Ownership

N-No minerals are owned by the U.S.

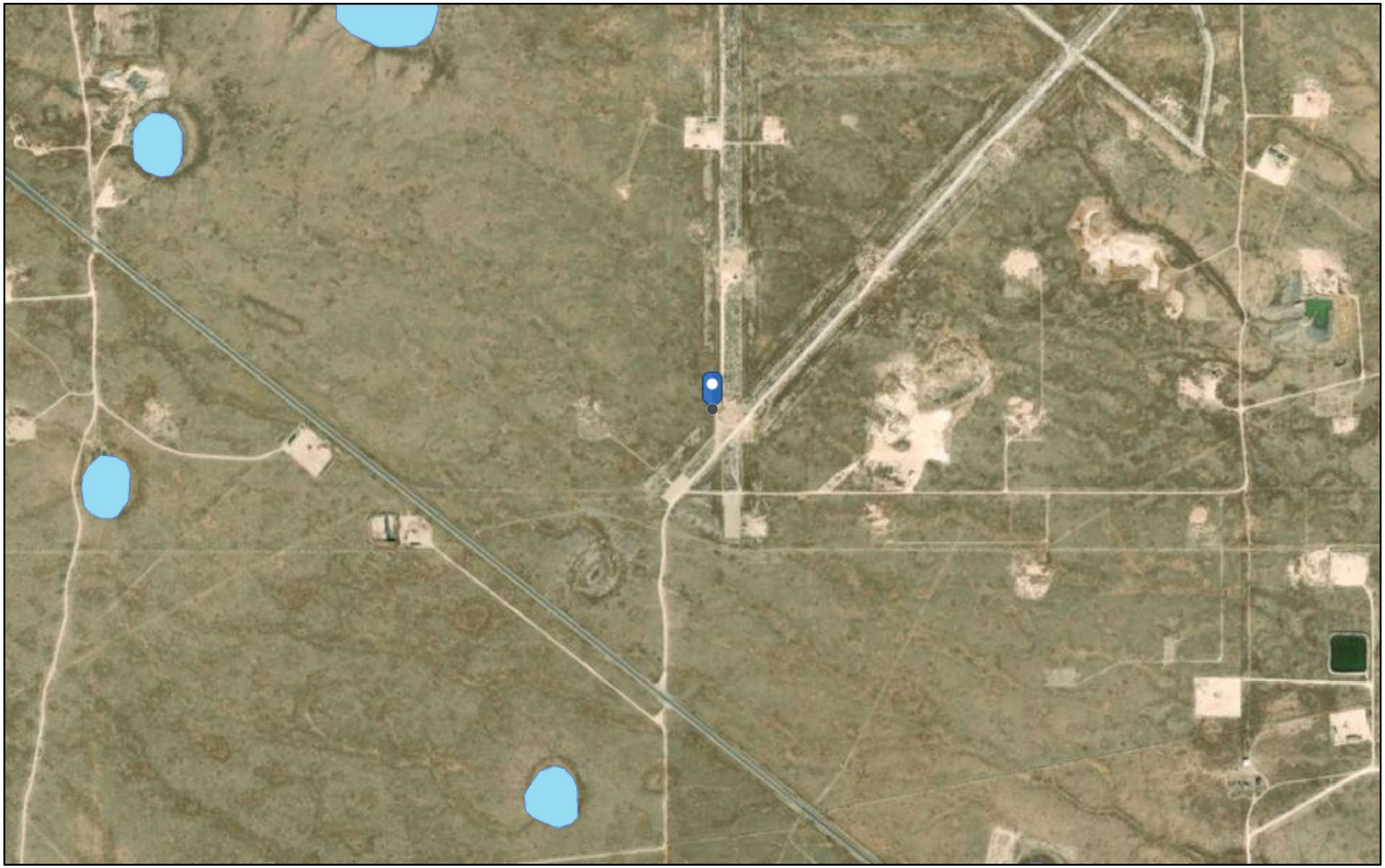
Land Ownership

S

New Mexico Oil Conservation Division

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

OCD Water Bodies Map



9/22/2023, 12:19:54 PM

OSW Water Bodys

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

OCD, Esri, HERE, Garmin, iPC, Maxar, NM OSE

New Mexico Oil Conservation Division

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

APPENDIX D
Photographic Documentation

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View of approximate release point.	1
	SITE NAME	ORIOLE STATE COM 1 Release	UNK

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View of approximate release Extent.	2
	SITE NAME	ORIOLE STATE COM 1 Release	UNK

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View west of approximate release extent. Surface polylines present.	3
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View southwest of release. Surface polylines and lay flat.	4
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View south-southwest of approximate release extent. Surface polylines and lay flat.	5
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View north of approximate release extent. Surface polylines and lay flat. Staining observed.	6
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View south-southwest of approximate release extent. Surface polylines and lay flat. Staining observed.	7
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

TETRA TECH, INC. PROJECT NO. 212C-MD-03236	DESCRIPTION	View north-northeast of approximate release extent. Surface polylines and lay flat.	8
	SITE NAME	ORIOLE STATE COM 1 Release	9/19/2023

APPENDIX E
Laboratory Analytical Data

CARDINAL Laboratories

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

October 05, 2023

CHRISTIAN LLULL

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: ORIOLE STATE COM #001 FLOWLINE RELEASE

Enclosed are the results of analyses for samples received by the laboratory on 09/29/23 15:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-22-15. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 1 (0'-1') (H235332-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *118 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**6400**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

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

Surrogate: 1-Chlorooctadecane *105 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 1 (1.5'-1.75') (H235332-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *115 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**8400**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *91.6 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *96.4 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 2 (0'-1') (H235332-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *118 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**7200**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *92.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *96.1 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 3 (0'-1') (H235332-04)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *118 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1540**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	**15.5**	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *92.3 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *97.6 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 3 (1.5'-1.75') (H235332-05)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *116 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3400**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	**10.7**	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *87.8 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *90.8 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 4 (H235332-06)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *117 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *81.5 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *84.1 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 5 (H235332-07)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *117 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *83.6 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *87.1 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 6 (H235332-08)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *117 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	<10.0	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *89.6 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *93.0 %* *49.1-148*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CHRISTIAN LLULL
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	09/29/2023	Sampling Date:	09/29/2023
Reported:	10/05/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: AH - 7 (H235332-09)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/03/2023	ND	2.14	107	2.00	4.20	
Toluene*	<0.050	0.050	10/03/2023	ND	2.21	110	2.00	1.80	
Ethylbenzene*	<0.050	0.050	10/03/2023	ND	2.18	109	2.00	1.98	
Total Xylenes*	<0.150	0.150	10/03/2023	ND	6.32	105	6.00	3.92	
Total BTEX	<0.300	0.300	10/03/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *115 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/02/2023	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/02/2023	ND	180	90.0	200	1.86	
DRO >C10-C28*	**10.1**	10.0	10/02/2023	ND	213	107	200	0.789	
EXT DRO >C28-C36	<10.0	10.0	10/02/2023	ND					

Surrogate: 1-Chlorooctane *84.0 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *87.6 %* *49.1-148*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Conoco Phillips
Project Manager:	Christian Llull
Address:	
City:	State: Zip:
Phone #:	Fax #:
Project #:	212C-MD-03236 Project Owner:
Project Name:	Oriole State Com #001 Flowline Release
Project Location:	Lea Co, NM
Sampler Name:	Andrew Garcia

BILL TO

P.O. #:	
Company:	Tetratech
Attn:	Christian Llull
Address:	
City:	
State: Zip:	
Phone #:	
Fax #:	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: 2023 DATE	TIME	TPH	BTEX	Chlorides 4500
H235332-1	AH-1 (0'-1')	G	1			X					X		29 Sept	900	X	X	X
2	AH-1 (1.5'-1.75')													930			
3	AH-2 (0'-1')													1000			
4	AH-3 (0'-1')													1030			
5	AH-3 (1.5'-1.75')													1100			
6	AH-4													1130			
7	AH-5													1200			
8	AH-6													1215			
9	AH-7													1230			
10																	

Relinquished By:	Date: 29 Sept 23	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
Andrew Garcia	Time: 1530		All Results are emailed. Please provide Email address:
Relinquished By:	Date:	Received By:	Christian.Llull@tetratech.com
	Time:		REMARKS: Lisbeth.Chavira@tetratech.com

Delivered By: (Circle One)	Observed Temp. °C 24	Sample Condition: Cool ☑ Yes ☐ No / Intact ☑ Yes ☐ No	CHECKED BY: (Initials) TO	Turnaround Time: Standard ☒ / Rush ☐
Sampler - UPS - Bus - Other:	Corrected Temp. °C			Thermometer ID #140 Correction Factor 0°C

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

FORM-006 R 3.4 07/11/23

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

CARDINAL Laboratories

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

October 20, 2023

SAM ABBOTT

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: ORIOLE STATE COM #001 FLOWLINE RELEASE

Enclosed are the results of analyses for samples received by the laboratory on 10/17/23 14:28.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-22-15. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 1 (0-1') (H235670-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.05	102	2.00	3.85	
Toluene*	<0.050	0.050	10/19/2023	ND	2.15	107	2.00	1.23	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.12	106	2.00	1.41	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.28	105	6.00	1.83	
Total BTEX	<0.300	0.300	10/19/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *124 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**7440**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

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

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 1 (2'-3') (H235670-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.05	102	2.00	3.85	
Toluene*	<0.050	0.050	10/19/2023	ND	2.15	107	2.00	1.23	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.12	106	2.00	1.41	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.28	105	6.00	1.83	
Total BTEX	<0.300	0.300	10/19/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *121 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3920**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

Surrogate: 1-Chlorooctane *92.4 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *104 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 1 (3'-4') (H235670-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.05	102	2.00	3.85	
Toluene*	<0.050	0.050	10/19/2023	ND	2.15	107	2.00	1.23	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.12	106	2.00	1.41	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.28	105	6.00	1.83	
Total BTEX	<0.300	0.300	10/19/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *121 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2280**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

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

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 1 (4'-5') (H235670-04)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.08	104	2.00	1.13	
Toluene*	<0.050	0.050	10/19/2023	ND	2.14	107	2.00	1.79	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.29	115	2.00	2.30	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.92	115	6.00	2.51	
Total BTEX	<0.300	0.300	10/19/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID *110 %* *71.5-134*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**384**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

Surrogate: 1-Chlorooctadecane *99.9 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 2 (2'-3') (H235670-05)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.08	104	2.00	1.13	
Toluene*	<0.050	0.050	10/19/2023	ND	2.14	107	2.00	1.79	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.29	115	2.00	2.30	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.92	115	6.00	2.51	
Total BTEX	<0.300	0.300	10/19/2023	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2400**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

Surrogate: 1-Chlorooctadecane *110 %* *49.1-148*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 2 (3'-4') (H235670-06)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.08	104	2.00	1.13	
Toluene*	<0.050	0.050	10/19/2023	ND	2.14	107	2.00	1.79	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.29	115	2.00	2.30	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.92	115	6.00	2.51	
Total BTEX	<0.300	0.300	10/19/2023	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**992**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

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

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 3 (2'-3') (H235670-07)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.08	104	2.00	1.13	
Toluene*	<0.050	0.050	10/19/2023	ND	2.14	107	2.00	1.79	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.29	115	2.00	2.30	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.92	115	6.00	2.51	
Total BTEX	<0.300	0.300	10/19/2023	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1020**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

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

Surrogate: 1-Chlorooctadecane *97.0 %* *49.1-148*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
SAM ABBOTT
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	10/17/2023	Sampling Date:	10/16/2023
Reported:	10/20/2023	Sampling Type:	Soil
Project Name:	ORIOLE STATE COM #001 FLOWLINE RE	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-03236	Sample Received By:	Tamara Oldaker
Project Location:	COP LEA CO. , NM		

Sample ID: T - 3 (3'-4') (H235670-08)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/19/2023	ND	2.08	104	2.00	1.13	
Toluene*	<0.050	0.050	10/19/2023	ND	2.14	107	2.00	1.79	
Ethylbenzene*	<0.050	0.050	10/19/2023	ND	2.29	115	2.00	2.30	
Total Xylenes*	<0.150	0.150	10/19/2023	ND	6.92	115	6.00	2.51	
Total BTEX	<0.300	0.300	10/19/2023	ND					

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

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**544**	16.0	10/18/2023	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2023	ND	172	86.0	200	3.60	
DRO >C10-C28*	<10.0	10.0	10/18/2023	ND	191	95.4	200	4.82	
EXT DRO >C28-C36	<10.0	10.0	10/18/2023	ND					

Surrogate: 1-Chlorooctane *95.5 %* *48.2-134*

Surrogate: 1-Chlorooctadecane *107 %* *49.1-148*

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Celey D. Keene, Lab Director/Quality Manager

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Notes and Definitions

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

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Tetra Tech		BILL TO	
Project Manager: Sam Abbott		P.O. #:	
Address: 8911 Capital o Texas Hwy, Suite 2310		Company: Tetra Tech	
City: Austin	State: TX Zip:	Attn: Sam Abbott	
Phone #: (512)565-0190	Fax #:	Address: EMAIL	
Project #: 212C-MD-03236	Project Owner: ConocoPhillips	City:	
Project Name: Oriole State Com #001 Flowline Release		State: Zip:	
Project Location: Lea County, New Mexico		Phone #:	
Sampler Name: Colton Bickerstaff		Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	TPH 8015M	BTEX 8021B	Chloride SM4500CI-B
H235670																	
1	T-1 (0-1')	G	1			X					X		10/16/2023		X	X	X
2	T-1 (2'-3')	G	1			X					X		10/16/2023		X	X	X
3	T-1 (3'-4')	G	1			X					X		10/16/2023		X	X	X
4	T-1 (4'-5')	G	1			X					X		10/16/2023		X	X	X
5	T-2 (2'-3')	G	1			X					X		10/16/2023		X	X	X
6	T-2 (3'-4')	G	1			X					X		10/16/2023		X	X	X
7	T-3 (2'-3')	G	1			X					X		10/16/2023		X	X	X
8	T-3 (3'-4')	G	1			X					X		10/16/2023		X	X	X

Relinquished By: Colton Bickerstaff	Date: 10/17/23 Time: 1428	Received By: Tamara Oldaker	Verbal Result: ☐ Yes ☐ No Add'l Phone #: All Results are emailed. Please provide Email address: Sam.Abbott@tetratech.com
Relinquished By:	Date: Time:	Received By:	REMARKS:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Observed Temp. °C 1.7 Corrected Temp. °C	Sample Condition Cool Intact ☑ Yes ☑ Yes ☐ No ☐ No	CHECKED BY: (Initials) T.O.

Turnaround Time: Standard ☒ Bacteria (only) Sample Condition
Rush: NO, N/A ☐ Cool Intact Observed Temp. °C
Thermometer ID ~~#113~~ #140
Correction Factor ~~0.5°C~~ T.O. 10/17/23
☐ Yes ☐ Yes ☐ No ☐ No Corrected Temp. °C

FORM-006 R 3.2 10/07/21

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

APPENDIX F
Seed Mixture Details

Custom Soil Resource Report
Soil Map

Map Scale: 1:284 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 4 8 16 24

Feet: 0 10 20 40 60

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	0.1	100.0%
Totals for Area of Interest		**0.1**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Lea County, New Mexico

KU—Kimbrough-Lea complex, dry, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tw46
Elevation: 2,500 to 4,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Kimbrough and similar soils: 45 percent
Lea and similar soils: 25 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimbrough

Setting

Landform: Playa rims, plains
Down-slope shape: Convex, linear
Across-slope shape: Concave, linear
Parent material: Loamy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 3 inches: gravelly loam
Bw - 3 to 10 inches: loam
Bkkm1 - 10 to 16 inches: cemented material
Bkkm2 - 16 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 4 to 18 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 95 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
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Hydric soil rating: No

Description of Lea

Setting

Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous, loamy eolian deposits from the blackwater draw formation of pleistocene age over indurated caliche of pliocene age

Typical profile

A - 0 to 10 inches: loam
Bk - 10 to 18 inches: loam
Bkk - 18 to 26 inches: gravelly fine sandy loam
Bkkm - 26 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 22 to 30 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: 90 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R077DY047TX - Sandy Loam 12-17" PZ
Hydric soil rating: No

Minor Components

Kenhill

Percent of map unit: 12 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077DY038TX - Clay Loam 12-17" PZ
Hydric soil rating: No

Douro

Percent of map unit: 12 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077DY047TX - Sandy Loam 12-17" PZ
Other vegetative classification: Unnamed (G077DH000TX)
Hydric soil rating: No

Spraberry

Percent of map unit: 6 percent
Landform: Playa rims, plains
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Other vegetative classification: Unnamed (G077DH000TX)
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

1 REVEGETATION PLANS

The following Revegetation Plans were developed for revegetation of sites in southeastern New Mexico. To determine which revegetation plan is appropriate follow procedures in the section titled Determining the Revegetation Plan.

Revegetation Plans contain seed mixtures, as well as seed bed preparation and planting requirements. The detailed instructions for seedbed preparation and planting can be found in the section Revegetation Techniques.

Table 3 - Revegetation Plans, Codes, and Soil Types for Southeastern New Mexico

REVEGTATION PLANS	CODE	SOIL TEXTURES
Clay	C	Clay, Silty Clay, Stony Silty Clay, Clay Loam, Silty Clay Loam (including saline and sodic Clay soils)
Loam	L	Silty Loam, Cobbly Silt Loam, Stony Silt Loam, Silt, Loam, Sandy, Clay Loam
Sandy Loam	SL	Very Fine Sandy Loam, Fine Sandy Loam, Cobbly Fine Sandy Loam, Sandy Loam, Cobbly Sandy Loam, Gravelly Fine Sandy Loam, Very Gravelly Fine Sand Loam, Stony Fine Sandy Loam, Stony Sandy Loam
Shallow	SH	Rocky Loam, Cobbly Loam
Course	CS	Gravelly Loam, very Gravelly Loam, Gravelly Sandy Loam, Very Gravelly Sandy Loam, Stony Loam, Stony Sandy Loam
Sandy	S	Loamy Fine Sand, Loam Sand, Very Gravelly Loamy Fine Sand
Blow Sand	BS	Fine Sand, Sand, Coarse Sand
Mountain Meadow	MM	Clay, Loam
Mountain Upland	MU	Clay Loam, Loam

NMSLO Seed Mix Coarse (CS)

COARSE (CS) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sand bluestem	VNS, Southern	2.0	F
Sideoats grama	Vaughn, El Reno	2.0	F
Blue grama	Hachita, Lovington	1.5	D
Little bluestem	Cimmaron, Pastura	1.5	F
Sand dropseed	VNS, Southern	1.0	S
Plains bristlegrass	VNS, Southern	0.75	D
Forbs:			
Parry penstemon	VNS, Southern	1.0	D
Desert globemallow	VNS, Southern	1.0	D
White prairieclover	Kaneb, VNS	0.5	D
Sulfur buckwheat	VNS, Southern	0.5	D
Shrubs:			
Fourwing saltbush	VNS, Southern	1.0	D
Skunkbush sumac	VNS, Southern	1.0	D
Common winterfat	VNS, Southern	1.0	F
Fringed sagewort	VNS, Southern	0.5	F
	Total PLS/acre	**18.25**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box

- VNS, Southern – No Variety Stated, seed should be from a southern latitude collection of this species.
- Double above seed rates for broadcast or hydroseeding.
- If Parry is not available, substitute firecracker penstemon.
- If desert globemallow is not available, substitute scarlet globemallow.
- If one species is not available, provide a suggested substitute to the New Mexico Land Office for approval. Increasing all other species proportionately may be acceptable.

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

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

CONDITIONS

Action 289511

CONDITIONS

Operator: COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701	OGRID: 229137
	Action Number: 289511
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
bhall	None	3/8/2024