

Location:	Corral Canyon 8 Sat		
Spill Date:	6/29/2025		
Incident #:			
Area 1			
Approximate Area =	1154	sq. ft.	
Average Saturation (or depth) of spill =	0.50	inches	
Average Porosity Factor =			
VOLUME OF LEAK			
Total Crude Oil =	2.00	bbls	
Total Produced Water =	3.00	bbls	
TOTAL VOLUME OF LEAK			
Total Crude Oil =	2.00	bbls	
Total Produced Water =	3.0	bbls	
TOTAL VOLUME RECOVERED			
Total Crude Oil =	1.50	bbls	
Total Produced Water =	2.5	bbls	



September 29, 2025

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

**Re: Deferral Request
Corral Canyon 8 Sat
Incident Number NAPP2518148302
Eddy County, New Mexico**

To Whom It May Concern:

Ensolum, LLC (Ensolum), on behalf of XTO Energy, Inc. (XTO), has prepared this *Deferral Request*, describing delineation activities and the results of an engineering evaluation and karst survey at the Corral Canyon 8 Sat (Site). The purpose of the report is to describe release response activities following a release of crude oil and produced water at the Site and support deferral of final remediation of Incident Number NAPP2518148302 until the Site is reconstructed and/or the facility pad is abandoned.

SITE DESCRIPTION AND RELEASE SUMMARY

The Site is located in Unit K, Section 08, Township 25 South, Range 29 East, in Eddy County, New Mexico (32.14281°, -104.006918°) and is associated with oil and gas exploration and production operations on Federal Land managed by the Bureau of Land Management (BLM).

On June 29, 2025, corrosion on a gasket of a transfer pump resulted in the release of 2 barrels (bbls) of crude oil and 3 bbls of produced water within an impermeable containment and onto the surrounding facility pad surface, adjacent to and underneath active production equipment and surface lines. A vacuum truck was immediately dispatched to the Site to recover free-standing fluids. Approximately 1 bbl of crude oil and 2 bbls of produced water were recovered. XTO reported the release to the New Mexico Oil Conservation Division (NMOCD) via Notification of Release (NOR) and an Initial Release C-141 Application (C-141) on June 30, 2025. The release was assigned Incident Number NAPP2518148302.

The release location was initially reported to the NMOCD in Unit J of Section 08, Township 25 South, Range 29 East, but after review of release location coordinates and photographs provided by XTO, it was confirmed that the release occurred in Unit K of Section 08, Township 25 South, Range 29 East.

SITE CHARACTERIZATION AND CLOSURE CRITERIA

The Site was characterized to assess the applicability of Table I, Closure Criteria for Soils Impacted by a Release, of Title 19, Chapter 15, Part 29 (19.15.29) of the New Mexico Administrative Code (NMAC).

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Results from the characterization desktop review are presented below and potential Site receptors are identified on Figure 1.

Depth to groundwater at the Site is estimated to be greater than 100 feet below ground surface (bgs) based on the nearest groundwater well data. On June 2, 1997, New Mexico Office of State Engineer (OSE) permitted well C-02518 was advanced to a depth of 462 feet below ground surface (bgs) approximately 0.26 miles southeast of the Site. No moisture or groundwater was encountered during drilling activities. Although there is evidence of shallow groundwater to the north of the Site, the next closest data point was acquired on April 19, 2021. A soil boring (C-04503 POD 1) was drilled to a depth of 110 feet bgs approximately 0.80 miles southeast of the Site. The soil boring was dry, which provides additional support that groundwater beneath the Site is greater than 100 feet bgs. The referenced well records are included in Appendix A.

The closest continuously flowing or significant watercourse to the Site is a riverine, located approximately 780 feet south of the Site. The Site is greater than 200 feet from a lakebed, sinkhole, or playa lake and greater than 300 feet from an occupied residence, school, hospital, institution, church, or wetland. The Site is greater than 1,000 feet to a freshwater well or spring and is not within a 100-year floodplain or overlying a subsurface mine. The Site is underlain by unstable geology (medium potential karst designation area).

Based on the results of the Site Characterization, the following NMOCD Table I Closure Criteria (Closure Criteria) apply:

- Benzene: 10 milligrams per kilogram (mg/kg)
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX): 50 mg/kg
- Total petroleum hydrocarbons (TPH): 100 mg/kg
- Chloride: 600 mg/kg

LINER INTEGRITY INSPECTION

The lined containment overflowed as a result of the June 29, 2025, release of crude oil and produced water. A 48-hour advance notice of the liner inspection was submitted to the NMOCD on July 7, 2025. The liner was cleared of all debris and fluids. A liner integrity inspection was conducted by Ensolum personnel on July 8, 2025. No rips, tears, holes, or damage was observed. The liner was determined to be sufficient, and all released fluids from the containment were recovered. NMOCD correspondence for approval of the liner inspection is included in Appendix B. Photographic documentation of the inspection is included in Appendix C.

DELINEATION AND HAND SCRAPE ACTIVITIES

Between June 4 and June 15, 2025, Ensolum personnel visited the Site to evaluate the release extent based on information provided on the C-141, information provided by XTO, and visual observations. Six delineation soil samples (SS01 through SS06) were collected around the release extent from a depth of 0.25 feet bgs to assess the lateral extent of the release. Two boreholes (BH01 through BH02) were advanced via core drill to depths ranging from 1 foot to 2 feet bgs to assess the vertical extent of the release. Discrete soil samples were collected from each delineation borehole at depths ranging from 0.25 feet to 2 feet bgs. All soil samples were field screened for volatile organic compounds (VOCs) and chloride utilizing a calibrated photoionization detector (PID) and Hach® chloride QuanTab® test strips, respectively. The release extent and delineation soil sample locations were mapped utilizing a handheld

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Global Positioning System (GPS) unit and are depicted on Figure 2. Field screening results and observations for all boreholes advanced were logged on lithologic/soil sampling logs, which are included in Appendix D.

The delineation soil samples were placed directly into pre-cleaned glass jars, labeled with the location, date, time, sampler name, method of analysis, and immediately placed on ice. The soil samples were transported under strict chain-of-custody procedures to Cardinal Laboratories (Cardinal) in Hobbs, New Mexico, for analysis of the following constituents of concern (COCs): BTEX following United States Environmental Protection Agency (EPA) Method 8021B; TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), and TPH-oil range organics (ORO) following EPA Method 8015M/D; and chloride following EPA Method SM4500. Soil samples delivered to the laboratory the same day they were collected may not have equilibrated to the 6 degrees Celsius required for shipment and long-term storage but are considered to have been received in acceptable condition by the laboratory.

The entirety of the release extent was inaccessible to heavy equipment due to the presence of surface piping, beam supports, electrical boxes, LACT units, compressor equipment, concrete pads, and supports. The release extent was scraped to remove impacted soil to the maximum extent practicable (MEP) utilizing hand tools. The hand excavation occurred on the facility pad and around active production equipment and pipelines. The excavation extended vertically until refusal with hand tools was encountered, and laterally, with consideration of the multiple health and safety hazards associated with removing impacted soil in the vicinity of production equipment and flowlines. These hazards included but were not limited to; active electrical lines, active buried pipelines, immediately adjacent production equipment, production equipment footings and supports, and active surface pipelines (Photographs 13 through 16). These structures and conditions limit the available footprint for working with heavy machinery safely.

LABORATORY ANALYTICAL RESULTS

Laboratory analytical results for delineation soil samples SS01 through SS06 indicated all COC concentrations were in compliance with the strictest Table I Closure Criteria, successfully defining the lateral extent of the release. Additionally, BH01 indicated chloride and/or TPH concentrations exceeded the Closure Criteria at a depth of 0.25 feet bgs and 1-foot bgs, but were in compliance with the strictest Table I Closure Criteria at 2 feet bgs, successfully defining the vertical extent of the release. Laboratory analytical results for delineation borehole BH02 indicated total BTEX, TPH, and chloride concentrations exceeded the Closure Criteria at 0.5-feet bgs, but all COC concentrations were in compliance with the strictest Table I Closure Criteria at 1-foot bgs. Laboratory analytical results are summarized in Table 1, and the complete laboratory analytical reports are included as Appendix E.

ENGINEERING REVIEW

The Site was assessed by a person trained in Occupational Safety and Health Administration (OSHA) excavation and trench safety (Competent Person) under the consultation of a Registered Professional Engineer (RPE) licensed in the State of New Mexico. Soil type B was observed in the inaccessible area, a 47-foot by 35-foot section directly adjacent to and beneath active production piping and footings, and a central circulation pump lined containment. Immediately adjacent to the impacted soil is an electrical panel structure, additional surface piping and footings of varying dimensions, additional engineered pipe racks and platforms, and a lined containment containing three 300-bbl steel crude oil tanks.

Based on the Site conditions and following OSHA Excavation Standards, the RPE recommendation indicates excavation should not be completed within 2 feet of the edge of the lined containment or within 16 feet of the edge of the pipe rack footings. The RPS recommendation indicates excavation should not be completed within 10 feet of active lines with pressure and/or fluids. Based on the dimensions of the

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requested excavation and presence of adjacent structures, there is inadequate structure support to conduct excavation of the identified impacted soil in a manner that protects both personnel health and equipment stability.

A detailed description of the review and calculations is included in the *Excavation Guidance Document* in Appendix F. The *Excavation Guidance Document* is stamped by an RPE licensed in the state of New Mexico.

KARST SURVEY RESULTS

Southwest Geophysical Consulting, a BLM-approved third-party cave/karst contractor, conducted a desktop survey, aerial survey, and geophysical survey of the Site. In summary, no surface karst features within the 200-foot survey area surrounding the release extent were identified in the desktop or surface karst surveys. Results of the geophysical study indicated a well-layered geologic system is present beneath the Site with no anomalies in the data that would be consistent with air-filled subsurface voids or a pathway to groundwater. The *Environmental Karst Study Report* is presented in Appendix G.

DISCUSSION AND DEFERRAL REQUEST

The results of the karst survey confirm the impacted soil does not pose an imminent risk to deep groundwater at the Site based on the absence of any visible karst features through desktop and pedestrian surveys and absence of any anomalies observed through the geophysical survey to indicate voids. The absence of karst features beneath the Site indicates the subsurface is stable. Impacted soil was removed to the MEP via manual scraping and the engineering review indicates additional excavation would require major facility deconstruction. The remaining impacted soil has been fully delineated vertically and laterally to the strictest Closure Criteria. The proposed deferral area and all delineation soil samples used to define this area is depicted on Figure 3. As such, XTO requests deferral of final remediation for Incident Number nAPP2518148302. Waste-containing soil identified in the inaccessible area will be removed at the time of final reclamation of the well pad or major construction, whichever comes first.

If you have any questions or comments, please contact Ms. Tacoma Morrissey at (337) 257-8307 or tmorrissey@ensolum.com.

Sincerely,
Ensolum, LLC



Jeremy Reich
Project Geologist



Daniel R. Moir, PG (licensed in WY & TX)
Senior Managing Geologist

cc: Robbert Woodall, XTO
Kaylan Dirkx, XTO
BLM

Appendices:

Figure 1 Site Receptor Map

XTO Energy, Inc
Deferral Request
Corral Canyon 8 Sat

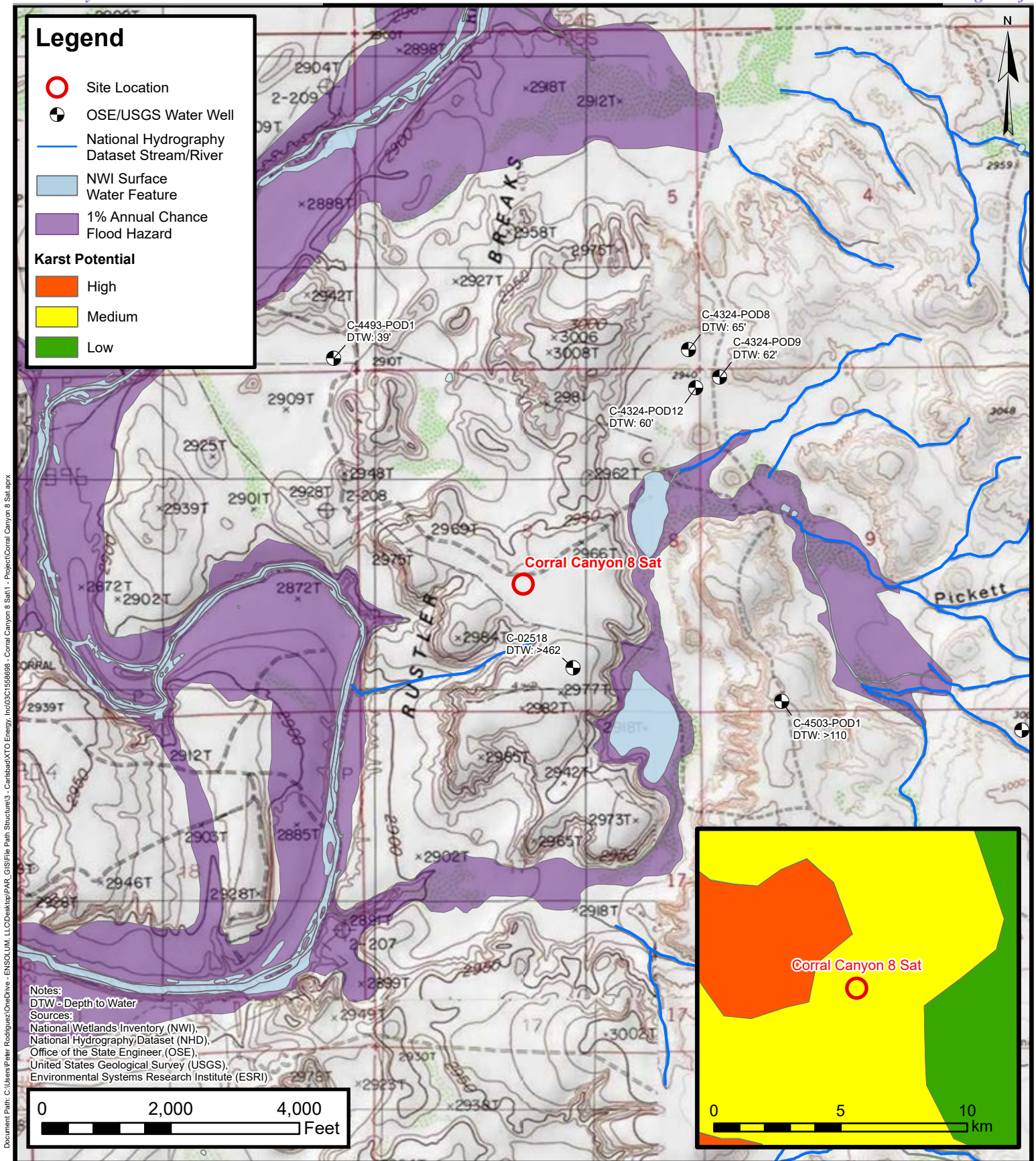
Figure 2 Delineation Soil Sample Locations
Figure 3 Requested Area of Deferral

Table 1 Soil Sample Analytical Results

Appendix A Well Record and Log
Appendix B NMOCD Correspondence
Appendix C Photographic Log
Appendix D Lithologic Soil Sampling Logs
Appendix E Laboratory Analytical Report & Chain of Custody Documentation
Appendix F Excavation Guidance Document
Appendix G Environmental Karst Study Report



FIGURES

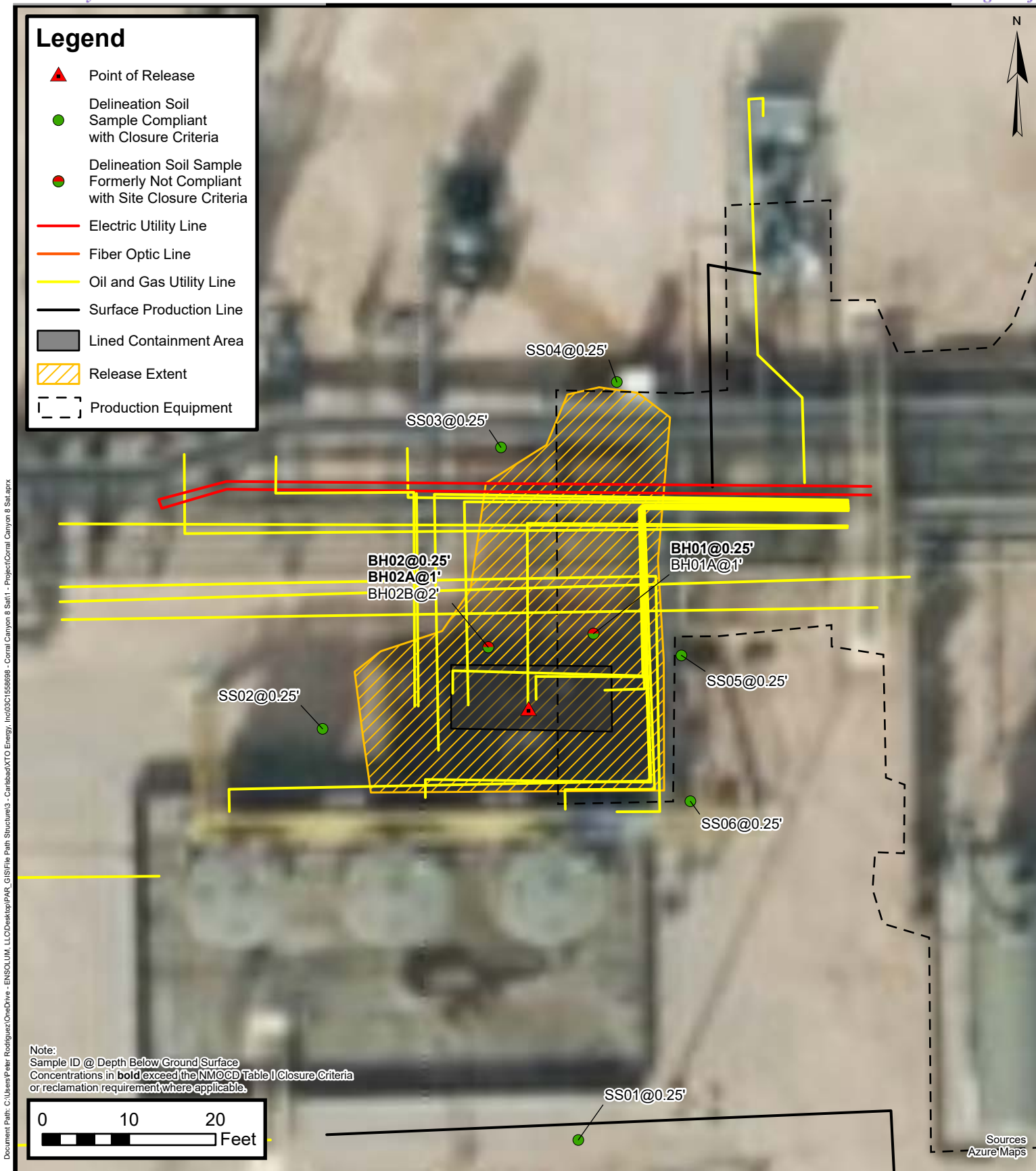


Site Receptor Map

XTO Energy, Inc
Corral Canyon 8 Sat
Incident Number: nAPP2518148302
Unit K, Section 08, T25S, R29E
Eddy County, New Mexico

FIGURE
1

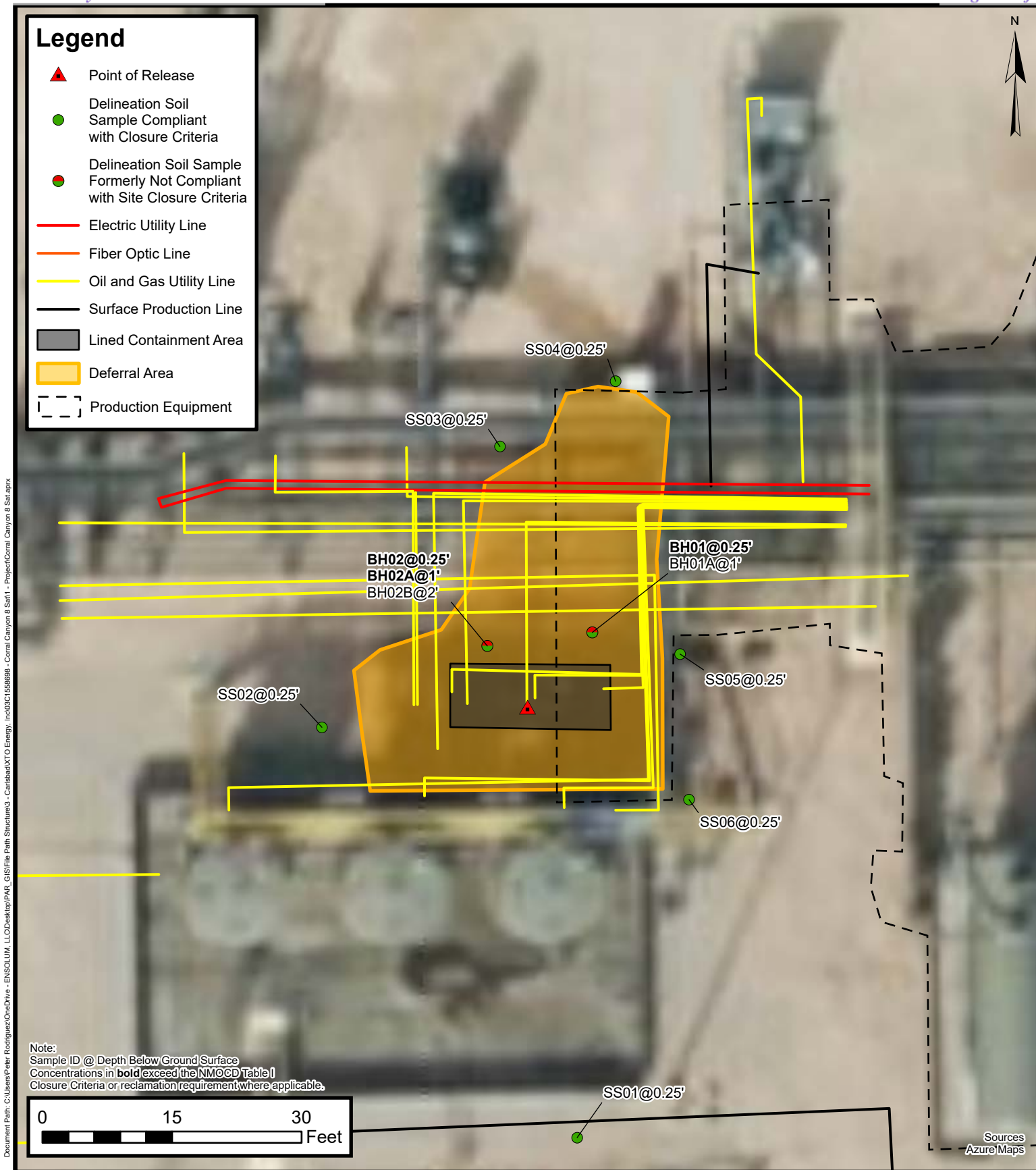
ENSOLUM
Environmental, Engineering and
Hydrogeologic Consultants



Delineation Soil Sample Locations

XTO Energy, Inc
Corral Canyon 8 Sat
Incident Number: nAPP2518148302
Unit K, Section 08, T25S, R29E
Eddy County, New Mexico

FIGURE
2



Requested Area of Deferral

XTO Energy, Inc
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FIGURE
3



TABLES



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
 Corral Canyon 8 Sat
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 XTO Energy, Inc
 Eddy County, New Mexico

Sample I.D.	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Total BTEX (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH ORO (mg/kg)	GRO+DRO (mg/kg)	Total TPH (mg/kg)	Chloride (mg/kg)
NMOCD Table I Closure Criteria (NMAC 19.15.29)			10	50	NE	NE	NE	NE	100	600
Delineation Soil Samples										
SS01	07/11/2025	0.25	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	48.0
SS02	07/11/2025	0.25	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	288
SS03	07/11/2025	0.25	<0.050	<0.300	<10.0	62.1	<10.0	62.1	62.1	80.0
SS04	07/11/2025	0.25	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	176
SS05	07/11/2025	0.25	<0.050	<0.300	<10.0	59.4	27.3	59.4	86.7	32.0
SS06	07/11/2025	0.25	<0.050	<0.300	<10.0	36.6	26.9	36.6	63.5	48.0
BH01	07/02/2025	0.25	<0.050	<0.300	19.1	8,750	1,680	8,769	10,449	1,330
BH01A	07/02/2025	1	<0.050	1.27	46.7	507	90.6	554	644	448
BH01B	07/02/2025	2	<0.050	<0.300	<10.0	17.9	13	17.9	30.9	480
BH02	07/02/2025	0.25	0.348	107	1,810	6,450	874	8,260	9,134	2,280
BH02A	07/02/2025	1	<0.050	<0.300	<10.0	18.6	11.5	18.6	30.1	112

Notes:

bgs: below ground surface

mg/kg: milligrams per kilogram

NMOCD: New Mexico Oil Conservation Division

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes

Concentrations in **bold** exceed the NMOCD Table I Closure Criteria or reclamation requirement where applicable.

GRO: Gasoline Range Organics

DRO: Diesel Range Organics

ORO: Oil Range Organics

TPH: Total Petroleum Hydrocarbon

NMAC: New Mexico Administrative Code

Grey text indicates soil sample removed during excavation activities



APPENDIX A

Well Record and Log

STATE ENGINEER OFFICE

WELL RECORD

465788

Revised June 1972

Section 1. GENERAL INFORMATION

OFFICE OF
STATE ENGINEER
SANTA FE, NEW MEXICO

(A) Owner of well Penwell Energy
Street or Post Office Address c/o Glenn's Water Well Service
City and State P.O. Box 692 Tatum, NM 88267

Owner's Well No. 99

FEB 1 PM 1 29

Well was drilled under Permit No. C-2518 and is located in the:a. 1/4 1/4 SW 1/4 SE 1/4 of Section 8 Township 25 Range 29 N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in
the _____ Grant.(B) Drilling Contractor Glenn's Water Well Service License No. WD -421Address P.O. Box 692 Tatum, NM 88267Drilling Began 6-2-97 Completed 6-2-97 Type tools rotary Size of hole 7 7/8 in.Elevation of land surface or _____ at well is _____ ft. Total depth of well 462 ft.Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
			dry hole	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
			none					

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

Section 5. PLUGGING RECORD

Plugging Contractor well was back filled with cuttingAddress and drilling mud

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1	0	460	cutting & mud
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 06-10-97

Quad _____ FWL _____ FSL _____

File No. C-2518 Use OWD Location No. 25S.29E.8.43412

"Dry Hole"

Section 6. LOG OF HOLE

[illegible]

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Corky G. Grew
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) POD1 (BH-01)		WELL TAG ID NO. n/a		OSE FILE NO(S). C-4503			
	WELL OWNER NAME(S) XTO Energy (Kyle Littrell)				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 6401 Holiday Hill Dr.				CITY Midland	STATE TX	ZIP 79707	
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 8	SECONDS 15.74	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND		
	LONGITUDE 103	59	38.34	W	* DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE SWSW S9 T25S R29E								
2. DRILLING & CASING INFORMATION	LICENSE NO. 1249		NAME OF LICENSED DRILLER Jackie D. Atkins			NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.		
	DRILLING STARTED 04/19/2021	DRILLING ENDED 04/19/2021	DEPTH OF COMPLETED WELL (FT) temporary well material		BORE HOLE DEPTH (FT) 110	DEPTH WATER FIRST ENCOUNTERED (FT) n/a		
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) n/a		
	DRILLING FLUID: <input type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> OTHER - SPECIFY: Hollow Stem Auger							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	110	±6.5	Boring- HSA	-	-	-	-
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	C-4503	POD NO.	1	TRN NO.	682792
LOCATION	Expl	25S.29E.9.334	WELL TAG ID NO.		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	4	4	Caliche, tan, off-white, dry, tan sand m-f grained, well sorted, trace silt	Y ✓ N	
	4	41	37	Sand, tan, m-f, well sorted, little caliche gravel, tan, trace silt, low consolidation	Y ✓ N	
	41	--	--	Sandy clay, brown, non plastic, non cohesive, no odor, no stain, m-f grained, we	Y ✓ N	
	43	46	5	increase in clay content, low plasticity Claystone, brown, light brown mottling,	Y ✓ N	
	46	110	64	Claystone, brown, light brown mottling, cohesive, medium plasticity	Y ✓ N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:					TOTAL ESTIMATED	
<input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:					WELL YIELD (gpm): 0.00	

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION:	<p>Corral Canyon 212H. Temporary well materials removed and the soil boring backfilled using drill cuttings from total depth to ten feet below ground surface, then hydrated bentonite chips from ten feet below ground surface to surface. Logs adapted from WSP on-site geologist.</p> <p style="text-align: right;">USE DTI MAY 5 2021 PM 4:04</p>
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Shane Eldridge	

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:	
	 _____ SIGNATURE OF DRILLER / PRINT SIGNED NAME	Jackie D. Atkins _____ DATE

FOR OSE INTERNAL USE		WR-20 WELL RECORD & LOG (Version 06/30/2017)	
FILE NO.	C-4503	POD NO.	1
LOCATION		TRN NO.	682792
		WELL TAG ID NO	PAGE 2 OF 2



APPENDIX B

NMOCD Correspondence

From: [Wells, Shelly, EMNRD](#)
To: [Mcafee, Ashley A](#)
Cc: [Dirkx, Kaylan](#); [Brown, Colton S](#); [Woodall, Robert D](#); [Tracy Hillard](#); [Tacoma Morrissey](#); [Ben Belill](#); [Bratcher, Michael, EMNRD](#); [Rodgers, Scott, EMNRD](#); [Hamlet, Robert, EMNRD](#)
Subject: RE: [EXTERNAL] XTO - Variance Request - Corral Canyon 8 Satellite - Incident Numbers nAPP2514157393 & nAPP2518148302
Date: Monday, July 7, 2025 5:12:36 PM

[**EXTERNAL EMAIL**]

Good afternoon Ashley,

The request is approved to conduct the liner inspection on 7/8/25 and use the photographs for closure, should the liner be deemed to be operating as intended. Please include a copy of this and all notifications in the remedial and/or closure reports to ensure the notifications are documented in the project file.

Kind regards,

Shelly

Shelly Wells * Environmental Specialist-Advanced
Environmental Bureau
EMNRD-Oil Conservation Division
1220 S. St. Francis Drive|Santa Fe, NM 87505
(505)469-7520 Shelly.Wells@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>

From: Mcafee, Ashley A <ashley.a.mcafee@exxonmobil.com>
Sent: Monday, July 7, 2025 3:21 PM
To: Enviro, OCD, EMNRD <OCD.Enviro@emnrd.nm.gov>
Cc: Dirkx, Kaylan <kaylan.dirkx@exxonmobil.com>; Brown, Colton S <colton.s.brown@exxonmobil.com>; Woodall, Robert D <robert.d.woodall@exxonmobil.com>; Tracy Hillard <thillard@ensolum.com>; Tacoma Morrissey <tmorrissey@ensolum.com>; Ben Belill <bbelill@ensolum.com>
Subject: [EXTERNAL] XTO - Variance Request - Corral Canyon 8 Satellite - Incident Numbers nAPP2514157393 & nAPP2518148302

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Hello,

XTO is requesting a variance of the 48-hr liner inspection notification (C-141L) requirement for a spill

at Corral Canyon 8 Satellite (Incident Numbers nAPP2514157393 & nAPP2518148302). Due to frequent weather delays and simultaneous operations (SIMOPS) in the area of the subject lined containment, successful liner inspection activities have not been completed. Access to the liner without SIMOPS is obtainable tomorrow in order to submit a closure request report required in 19.15.29.12.B.(1) NMAC with an adequate lined containment inspection. XTO requests the lined containment inspection photographs collected may be used for closure, providing that they meet applicable standards. XTO requests to complete the lined containment inspection tomorrow, July 8, 2025. Following approval of the variance, a C-141L will be submitted via the portal and the correspondence will be included in the final report.

Thank you,

Ashley McAfee
Wastewater Advisor

ExxonMobil Upstream Company
3104 E. Greene St.
Carlsbad, NM 88220
Cell Phone: 575-988-0812
Ashley.A.Mcafee@exxonmobil.com



APPENDIX C

Photographic Log

**Photographic Log**

XTO Energy, Inc.
Corral Canyon 8 Satellite
nAPP2518148302

322°NW (T) • 32.142757, -104.006843 ±3m ▲ 878m



Photograph: 1 Date: 06/30/2025
Description: Initial response, release area near lined containment
View: Northwest

178°S (T) • 32.142857, -104.006857 ±6m ▲ 878m



Photograph: 2 Date: 06/30/2025
Description: Stained area near SS04
View: South



Photograph: 3 Date: 07/02/2025
Description: Delineation activities near BH02
View: Northwest

187°S (T) • 32.143168, -104.007464 ±3m ▲ 404m



Photograph: 4 Date: 07/08/2025
Description: Lease sign
View: South



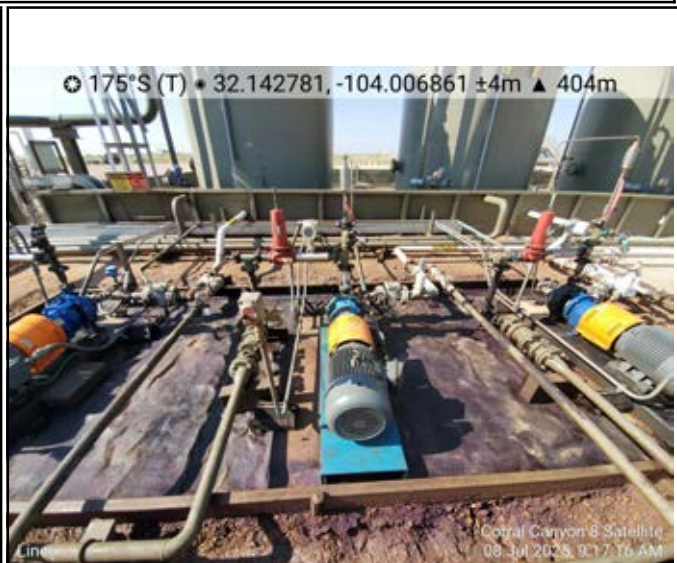
Photographic Log
XTO Energy, Inc.
Corral Canyon 8 Satellite
nAPP2518148302



Photograph: 5 Date: 07/08/2025

Description: Liner inspection activities

View: Southeast



Photograph: 6 Date: 07/08/2025

Description: Liner inspection activities

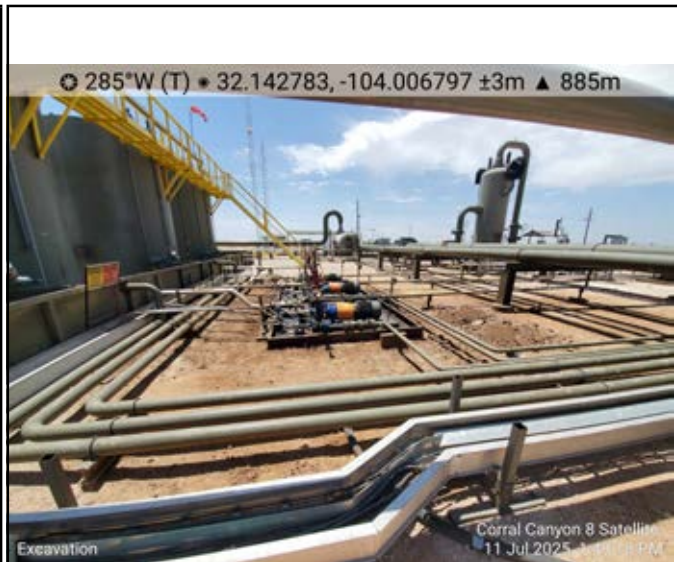
View: South



Photograph: 7 Date: 07/08/2025

Description: Liner inspection activities

View: East



Photograph: 8 Date: 07/11/2025

Description: Hand scrape area beneath surface piping and lined containment

View: West



Photographic Log
XTO Energy, Inc.
Corral Canyon 8 Satellite
nAPP2518148302



Photograph: 9 Date: 07/11/2025
Description: Hand excavation activities near lined containment
View: West



Photograph: 10 Date: 07/15/2025
Description: Hand excavation activities near the lined containment
View: Southeast



Photograph: 11 Date: 07/15/2025
Description: Hand scrape area beneath surface piping
View: North



Photograph: 12 Date: 07/15/2025
Description: Hand excavation activities near BH01
View: Northwest

**Photographic Log**

XTO Energy, Inc.
Corral Canyon 8 Satellite
nAPP2518148302



Photograph: 13 Date: 09/12/2025
Description: Surface piping and production equipment in release area
View: West



Photograph: 14 Date: 09/12/2025
Description: Piping near lined containment facing west
View: West



Photograph: 15 Date: 09/12/2025
Description: Piping near lined containment facing east
View: East





Photograph: 16 Date: 09/12/2025
Description: Surface piping and production equipment near release area
View: Northwest



APPENDIX D

Lithologic Soil Sampling Logs

 ENSOLUM		Sample Name: BH01		Date: 7/2/2025				
		Site Name: Corral Canyon 8 Sat						
		Incident Number: nAPP2518148302						
		Job Number: 03C1558698						
LITHOLOGIC / SOIL SAMPLING LOG								
Coordinates: 32.14281, -104.006918			Logged By: C. Wright		Method: Core Drill			
			Hole Diameter: 1.5 in		Total Depth: 2.0 ft			
Comments: Field screening conducted with HACH Chloride Test Strips and PID for chloride and vapor, respectively. Chloride test performed with 1:4 dilution factor of soil to distilled water. No correction factors included.								
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample ID	Sample Depth (ft bgs)	Depth (ft bgs)	USCS/Rock Symbol	Lithologic Descriptions
M	1330	10449	Y	BH01	0.25	0	SP-SM	Poorly Graded Sand w/ Silt and Gravel. Dark brown to black fine-grained sands, silts, and caliche clasts (0.5-2.5cm). Non-plastic, non-cohesive.
D	448	644	N	BH01A	1	1	Rock	Sandy Silt w/ Gravel. Light brown to white silts with fine-grained sand and caliche clasts (0.2-0.9 cm). Non-to-low plasticity, cohesive.
D	480	<41		BH01B	2	2		Gravelly Silt. Light brown to white silts w/ caliche clasts (0.2-1.5 cm) and fine-grained sand. Non-to-low plasticity, non-cohesive
						Total Depth @ 2' bgs		

 ENSOLUM		Sample Name: BH02		Date: 7/2/2025				
		Site Name: Corral Canyon 8 Sat						
		Incident Number: nAPP2518148302						
		Job Number: 03C1558698						
LITHOLOGIC / SOIL SAMPLING LOG								
Coordinates: 32.142883, -104.006843			Logged By: C. Wright		Method: Core Drill			
			Hole Diameter: 1.5 in		Total Depth: 1.0 ft			
Comments: Field screening conducted with HACH Chloride Test Strips and PID for chloride and vapor, respectively. Chloride test performed with 1:4 dilution factor of soil to distilled water. No correction factors included.								
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample ID	Sample Depth (ft bgs)	Depth (ft bgs)	USCS/Rock Symbol	Lithologic Descriptions
M	2280	9134	Y	BH02	0.25	0	SP-SM	Poorly Graded Sand w/ Silt and Gravel. Dark brown to black fine-grained sand, silts, and caliche clasts (0.3-3.0 cm). Non-plastic, non-cohesive.
D	112	< 40	N	BH02A	1	1	Rock	Massive limestone/Caliche. Light brown to white, medium-grained sand with carbonate matrix.
						Total Depth @ 1' bgs		



APPENDIX E

Laboratory Analytical Reports & Chain of Custody Documentation



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

July 08, 2025

JEREMY REICH

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: CORRAL CANYON 8 SATELLITE - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 07/03/25 12:46.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C25-00101. 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 accredited 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,

A handwritten signature in black ink that reads "Mike Snyder". The signature is fluid and cursive, with the first name "Mike" and last name "Snyder" clearly distinguishable.

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received:	07/03/2025	Sampling Date:	07/02/2025
Reported:	07/08/2025	Sampling Type:	Soil
Project Name:	CORRAL CANYON 8 SATELLITE - SPILLS	Sampling Condition:	Cool & Intact
Project Number:	03C1558698	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO 32.142883-104.006843		

Sample ID: BH 02 0.25' (H254007-01)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.348	0.200	07/03/2025	ND	1.89	94.7	2.00	1.36	
Toluene*	20.2	0.200	07/03/2025	ND	1.71	85.5	2.00	3.18	
Ethylbenzene*	4.35	0.200	07/03/2025	ND	1.73	86.7	2.00	3.30	
Total Xylenes*	81.9	0.600	07/03/2025	ND	5.42	90.3	6.00	4.25	
Total BTEX	107	1.20	07/03/2025	ND					

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2280	16.0	07/07/2025	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS						S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	1810	10.0	07/07/2025	ND	210	105	200	0.153		
DRO >C10-C28*	6450	10.0	07/07/2025	ND	203	102	200	1.09		
EXT DRO >C28-C36	874	10.0	07/07/2025	ND						

Surrogate: 1-Chlorooctane 314 % 44.4-145

Surrogate: 1-Chlorooctadecane 346 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/03/2025
Reported: 07/08/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.142883-104.006843

Sampling Date: 07/02/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: BH 02A 1.0' (H254007-02)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	07/03/2025	ND	1.89	94.7	2.00	1.36		
Toluene*	<0.050	0.050	07/03/2025	ND	1.71	85.5	2.00	3.18		
Ethylbenzene*	<0.050	0.050	07/03/2025	ND	1.73	86.7	2.00	3.30		
Total Xylenes*	<0.150	0.150	07/03/2025	ND	5.42	90.3	6.00	4.25		
Total BTEx	<0.300	0.300	07/03/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	112	16.0	07/07/2025	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	07/07/2025	ND	210	105	200	0.153	
DRO >C10-C28*	18.6	10.0	07/07/2025	ND	203	102	200	1.09	
EXT DRO >C28-C36	11.5	10.0	07/07/2025	ND					

Surrogate: 1-Chlorooctane 93.8 % 44.4-145

Surrogate: 1-Chlorooctadecane 88.8 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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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*=Accredited Analyte

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A handwritten signature in black ink, appearing to read "Mike Snyder", is written over a horizontal line.

Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

July 08, 2025

JEREMY REICH

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: CORRAL CANYON 8 SATELLITE - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 07/03/25 12:46.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C25-00101. 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 accredited 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,

A handwritten signature in black ink, appearing to read "Mike Snyder".

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received:	07/03/2025	Sampling Date:	07/02/2025
Reported:	07/08/2025	Sampling Type:	Soil
Project Name:	CORRAL CANYON 8 SATELLITE - SPILLS	Sampling Condition:	Cool & Intact
Project Number:	03C1558698	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO 32.142883-104.006843		

Sample ID: BH 01 0.25' (H254008-01)

BTEx 8021B		mg / kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	07/03/2025	ND	1.89	94.7	2.00	1.36		
Toluene*	<0.050	0.050	07/03/2025	ND	1.71	85.5	2.00	3.18		
Ethylbenzene*	<0.050	0.050	07/03/2025	ND	1.73	86.7	2.00	3.30		
Total Xylenes*	<0.150	0.150	07/03/2025	ND	5.42	90.3	6.00	4.25		
Total BTEX	<0.300	0.300	07/03/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 100 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1330	16.0	07/07/2025	ND	416	104	400	0.00		

TPH 8015M	mg/kg		Analyzed By: MS					S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	19.1	10.0	07/07/2025	ND	210	105	200	0.153	
DRO >C10-C28*	8750	10.0	07/07/2025	ND	203	102	200	1.09	
EXT DRO >C28-C36	1680	10.0	07/07/2025	ND					

Surrogate: 1-Chlorooctane 96.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 358 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/03/2025
Reported: 07/08/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.142883-104.006843

Sampling Date: 07/02/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: BH 01A 1.0' (H254008-02)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2025	ND	1.89	94.7	2.00	1.36	
Toluene*	<0.050	0.050	07/03/2025	ND	1.71	85.5	2.00	3.18	GC-NC
Ethylbenzene*	0.061	0.050	07/03/2025	ND	1.73	86.7	2.00	3.30	
Total Xylenes*	1.20	0.150	07/03/2025	ND	5.42	90.3	6.00	4.25	
Total BTEX	1.27	0.300	07/03/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 109 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	448	16.0	07/07/2025	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*	46.7	10.0	07/07/2025	ND	210	105	200	0.153	
DRO >C10-C28*	507	10.0	07/07/2025	ND	203	102	200	1.09	
EXT DRO >C28-C36	90.6	10.0	07/07/2025	ND					

Surrogate: 1-Chlorooctane 84.3 % 44.4-145

Surrogate: 1-Chlorooctadecane 89.2 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/03/2025
Reported: 07/08/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.142883-104.006843

Sampling Date: 07/02/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: BH 01B 2.0' (H254008-03)

BTX 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	07/03/2025	ND	1.89	94.7	2.00	1.36		
Toluene*	<0.050	0.050	07/03/2025	ND	1.71	85.5	2.00	3.18		
Ethylbenzene*	<0.050	0.050	07/03/2025	ND	1.73	86.7	2.00	3.30		
Total Xylenes*	<0.150	0.150	07/03/2025	ND	5.42	90.3	6.00	4.25		
Total BTX	<0.300	0.300	07/03/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	480	16.0	07/07/2025	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	07/07/2025	ND	210	105	200	0.153	
DRO >C10-C28*	17.9	10.0	07/07/2025	ND	203	102	200	1.09	
EXT DRO >C28-C36	13.0	10.0	07/07/2025	ND					

Surrogate: 1-Chlorooctane 82.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 79.5 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



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

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
GC-NC	8260 confirmation analysis was performed; initial GC results were not supported by GC/MS analysis and are reported as ND.
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

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

A handwritten signature in black ink, appearing to read "Mike Snyder", is written over a horizontal line.

Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



1 of 1

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]



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

July 16, 2025

JEREMY REICH

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: CORRAL CANYON 8 SATELLITE - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 07/14/25 12:29.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C25-00101. 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 accredited 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,

A handwritten signature in black ink that reads "Coley D. Keene". The signature is written in a cursive style with a large, stylized 'C' at the beginning.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received:	07/14/2025	Sampling Date:	07/11/2025
Reported:	07/16/2025	Sampling Type:	Soil
Project Name:	CORRAL CANYON 8 SATELLITE - SPILLS	Sampling Condition:	Cool & Intact
Project Number:	03C1558698	Sample Received By:	Shalyn Rodriguez
Project Location:	XTO 32.14281-104.006918		

Sample ID: SS 01 0.25 (H254168-01)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/15/2025	ND	1.79	89.5	2.00	4.85	
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94	
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91	
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13	
Total BTEx	<0.300	0.300	07/15/2025	ND					

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	<10.0	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	<10.0	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 108 % 44.4-145

Surrogate: 1-Chlorooctadecane 107 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/14/2025
Reported: 07/16/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.14281-104.006918

Sampling Date: 07/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SS 02 0.25 (H254168-02)

BTX 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	07/15/2025	ND	1.79	89.5	2.00	4.85		
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94		
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91		
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13		
Total BTX	<0.300	0.300	07/15/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	288	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	<10.0	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	<10.0	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 91.5 % 44.4-145

Surrogate: 1-Chlorooctadecane 88.8 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/14/2025
Reported: 07/16/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.14281-104.006918

Sampling Date: 07/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SS 03 0.25 (H254168-03)

BTX 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	07/15/2025	ND	1.79	89.5	2.00	4.85		
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94		
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91		
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13		
Total BTX	<0.300	0.300	07/15/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	80.0	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	62.1	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	<10.0	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 104 % 44.4-145

Surrogate: 1-Chlorooctadecane 108 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/14/2025
Reported: 07/16/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.14281-104.006918

Sampling Date: 07/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SS 04 0.25 (H254168-04)

BTX 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	07/15/2025	ND	1.79	89.5	2.00	4.85		
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94		
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91		
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13		
Total BTX	<0.300	0.300	07/15/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	176	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	<10.0	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	<10.0	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 98.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 95.8 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/14/2025
Reported: 07/16/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.14281-104.006918

Sampling Date: 07/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SS 05 0.25 (H254168-05)

BTX 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	07/15/2025	ND	1.79	89.5	2.00	4.85		
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94		
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91		
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13		
Total BTX	<0.300	0.300	07/15/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	59.4	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	27.3	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 103 % 44.4-145

Surrogate: 1-Chlorooctadecane 105 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
JEREMY REICH
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 07/14/2025
Reported: 07/16/2025
Project Name: CORRAL CANYON 8 SATELLITE - SPILLS
Project Number: 03C1558698
Project Location: XTO 32.14281-104.006918

Sampling Date: 07/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SS 06 0.25 (H254168-06)

BTX 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	07/15/2025	ND	1.79	89.5	2.00	4.85		
Toluene*	<0.050	0.050	07/15/2025	ND	2.07	104	2.00	3.94		
Ethylbenzene*	<0.050	0.050	07/15/2025	ND	2.09	105	2.00	1.91		
Total Xylenes*	<0.150	0.150	07/15/2025	ND	6.53	109	6.00	3.13		
Total BTX	<0.300	0.300	07/15/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: KH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	07/15/2025	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	07/15/2025	ND	210	105	200	1.63	
DRO >C10-C28*	36.6	10.0	07/15/2025	ND	190	94.9	200	0.0332	
EXT DRO >C28-C36	26.9	10.0	07/15/2025	ND					

Surrogate: 1-Chlorooctane 87.1 % 44.4-145

Surrogate: 1-Chlorooctadecane 88.7 % 40.6-153

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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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A handwritten signature in cursive script, appearing to read "Celey D. Keene", written in black ink.

Celey D. Keene, Lab Director/Quality Manager



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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Ensolum, LLC

Project Manager: Jeremy Reich

Address: 601 N Marlenfeld Street, Suite 400

City: Midland

Phone #: (432) 296-0627 Fax #:

Project #: 03C1558698 Project Owner: XTO Energy

Project Name: Cornal Canyon 8 Satellite - SPILLS

Project Location: 32.14281, -104.066918

Sampler Name: Trevor Wargo

BILL TO

P.O. #:

Company: XTO Energy, Inc

Attn: Cotton Brown

Address: 3104 E Greene St

City: Carlsbad

State: NM Zip: 88220

Phone #:

Fax #:

ANALYSIS REQUEST

Lab I.D.	Sample I.D.	Depth (feet)	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	ANALYSIS REQUEST					
					GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :			TPH 8015	BTEX 8021	Chloride 4500			
HAS41168	5501	0.25	✓	1	✓		✓				07/14/25	13:13	✓	✓	✓			
	5502											13:16	✓	✓	✓			
	5503											13:34	✓	✓	✓			
	5504											13:35	✓	✓	✓			
	5505											13:49	✓	✓	✓			
	5506											13:52	✓	✓	✓			

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Relinquished By:

Date: 7/14/25

Received By:

Verbal Result: ☐ Yes ☐ No

Add'l Phone #:

Email address: twargo@ensolum.com

Relinquished By: Trevor Wargo

Date: 7/29

Received By: Speedierney

REMARKS:

Incident Number: 24092518148302

Cost Center: 2225321001

Delivered By: (Circle One)

Temperature: 35.0 °C

Sample Condition: ☒ Intact ☐ Yes ☐ No

CHECKED BY: (Initials)

Turnaround Time: 48h

Standard: ☒ Rush

Bacteria (only) Sample Condition: ☐ Cool ☐ Intact ☐ Observed Temp. °C ☐ Corrected Temp. °C

Sampler - UPS - Bus - Other: Corrected Temp. °C 3.82

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



APPENDIX F

Excavation Guidance Document



September 26, 2025

New Mexico Oil Conservation Division

1220 South St. Francis Drive
Santa Fe, New Mexico 87505

**Re: Excavation Guidance Document
Corral Canyon 8 Sat
Incident Number nAPP2518148302
Eddy County, New Mexico**

To Whom It May Concern:

Ensolum, LLC (Ensolum) has prepared this document on behalf of XTO Energy, Inc (XTO), to provide guidance on safety precautions related to the proposed excavation near existing production equipment and lined containment. This guidance applies to the proposed excavation and applies only to the Corral Canyon 8 Sat (Site), for which a Requested Area of Deferral is attached as Figure 1.

This document has been prepared in accordance with the Occupational Safety and Health Administration (OSHA) Excavation Standard 29 Code of Federal Regulations (CFR) Part 1926 Sub-part P Section 1926.652(i) and 1926.652(j) and under the consultation of a Registered Professional Engineer (RPE). The document includes a review of the stability of adjacent structures and protection of employees from loose rocks, soil, and equipment and analysis of the following parameters:

- Soil types and conditions leading to cave-ins;
- Stability of engineered facility equipment with requested excavation;
- Protection of employees from materials and equipment that could fall or roll into an excavation; and
- Other hazardous conditions, including confined spaces.

This guidance document must be reviewed before starting any proposed excavation activities and kept on site if excavation activities are occurring. In addition, a copy of the OSHA Excavation Standard 29 CFR Part 1926 Sub-part P will be kept on site.

Review of OSHA Excavation Standards indicates the following guidance for general excavation activities:

- The walls of any excavated areas must be sloped to a maximum 1 horizontal to 1 vertical for Type B soils. Soil types shall be evaluated by a trained competent person prior to any excavation.
- OSHA Excavation Standard 29 CFR Part 1926 Sub-part P indicates the following:
 - Excavation below the level of the base or footing of any foundation or retaining wall poses a reasonable hazard to employees and should not be conducted without the removal of equipment adjacent to the proposed excavation and/or installation of physical safety measures such as shoring or other protective structures to prevent structural failure of

XTO Energy, Inc
Excavation Guidance Document
Corral Canyon 8 Sat

the equipment foundation and to ensure safety to employees working near the proposed excavation.

- Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into any excavation. Protection shall be provided by placing and keeping such materials or equipment at least two feet (0.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
- When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a Competent Person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope and shall assure that such a reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(i).

EXCAVATION ANALYSIS PARAMETERS

The following findings were observed at the Site:

- Type B soil was observed during the Site visit. Type B soil will be utilized for determining excavation slopes and excavation setbacks. A competent person will inspect the site daily and note any changes in soil type during excavation activities. If type A or type C soil is identified, the excavation slope and excavation setback will be modified to account for this change.
- Maximum excavation depth of 2 feet bgs was utilized for the excavation setbacks. Adjustment of the maximum depth of the excavation will require modifications to the setbacks described below.
- The proposed excavation area entails a polygon with maximum dimensions of 45 feet by 31 feet directly adjacent to a multiple structures containing production equipment and active pipelines as shown on Figure 2.
- To the south of the proposed excavation area is an engineered lined containment containing multiple pipelines, stair and platform supports, and large holding tanks. The lined containment measures 35.5 feet wide by 58.5 feet in length. The lined containment lays directly onto the pad surface. Three large cylindrical tanks measuring 12 feet in diameter and 15 feet in height reside within the lined containment.
- Directly overlaying and adjacent to the proposed excavation area are multiple production pipelines lying on supports of varying dimensions. The production pipelines range in diameter from 2.5 inches to 6 inches. Multiple pipes running across the northern portion of the extent are supported by a pipe rack measuring 8 feet wide by over 300 feet long.
- The central portion of the proposed excavation area is an engineered lined containment containing three circulation pumps. The lined containment measures 8.58 feet wide by 19.6 feet in length. The lined containment lays directly onto the pad surface.
- To the northeast of the proposed excavation area is an electrical panel. The electrical panel is supported by a concrete base that measures 35 inches wide by 59 inches long laying directly on pad surface.
- The production pipeline and platform supports throughout the entire proposed excavation area range in dimensions of 4 inches wide by 8 inches long up to 4 inches wide by 54 inches long.

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Corral Canyon 8 Sat

ENGINEER RECOMMENDATIONS

Review of the above-mentioned parameters, OSHA regulations, and Site conditions observed during Site visits were completed and the following RPE recommendations were reached:

- Stress to the soil below the lined containment structure can be estimated by the 2:1 Stress Distribution Model in the proposed excavation area adjacent to the lined containment. The beginning of the slope should be limited to beginning no less than 2 feet from the edge of the lined containment footing per above stated OSHA guidelines.
- The production pipelines that the proposed excavation area are supported by footings of varying dimensions. The beginning of the slope should be limited to beginning no less than two feet from the edge of any pipeline support per above stated OSHA guidelines. Review of the potential pipe stress and deflection during an excavation directly below pipelines, the pipelines can experience increased tension and compression causing increased hoop stress. Even if additional supports are installed in the process of excavation, the brief time they remain unsupported can cause pipe fatigue and eventually pipe failure. It is reasonable to assume that an increase in hoop stress and increase of pipe fatigue on the pipeline system can exceed the engineered parameters and lead to pipeline failure resulting in an additional release. It is not recommended to excavate directly below any of the pipelines.
- Stress to the soil below the pipe rack running across the northern portion of the proposed excavation area can be estimated utilizing Boussinesq's infinitely long strip footing. The beginning of the slope should be limited to beginning no less than 16 feet from the edge of the pipe rack footings.
- Stress to the soil below the central circulation pump lined containment structure can be estimated by the 2:1 Stress Distribution Model in the proposed excavation area adjacent to the lined containment. The beginning of the slope should be limited to beginning no less than 2 feet from the edge of the lined containment footing per above stated OSHA guidelines.
- Stress to the soil below the pipeline and platform singular point support structures can be estimated by the 2:1 Stress Distribution Model in the area of requested. The beginning of the slope should be limited to beginning no less than 2 feet from the edge of the singular point support structure per above stated OSHA guidelines or 4 times the width of the support footing, whichever is greater. This recommendation applies to shut in lines with no pressure and/or fluids contained. For active lines with pressure and/or fluid contained, the beginning of the slope should be limited to beginning no less than 10 feet from the edge of the singular point support structure.
- Stress to the soil below the electrical panel structure can be estimated by the 2:1 Stress Distribution Model in the proposed excavation area. The beginning of the slope should be limited to beginning no less than 2 feet from the edge of the lined containment footing per above stated OSHA guidelines.
- Due to the presence of production equipment and lined containment, excavation directly below any of the current lined containment areas is not recommended and would require substantial deconstruction and/or additional support for equipment. These areas lay directly below and adjacent to engineered lined containments and excavation of the identified areas may result in loss of effectiveness or competency of the lined containment.

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CONCLUSIONS

Based on the dimensions of the requested excavation and presence of adjacent structures, there is inadequate structure support to conduct excavation of the identified impacted soil in a manner that both protects personnel health and equipment stability.

Sincerely,

Ensolum, LLC



09/26/2025



Brian Sulzberger, PE
Associate Principal

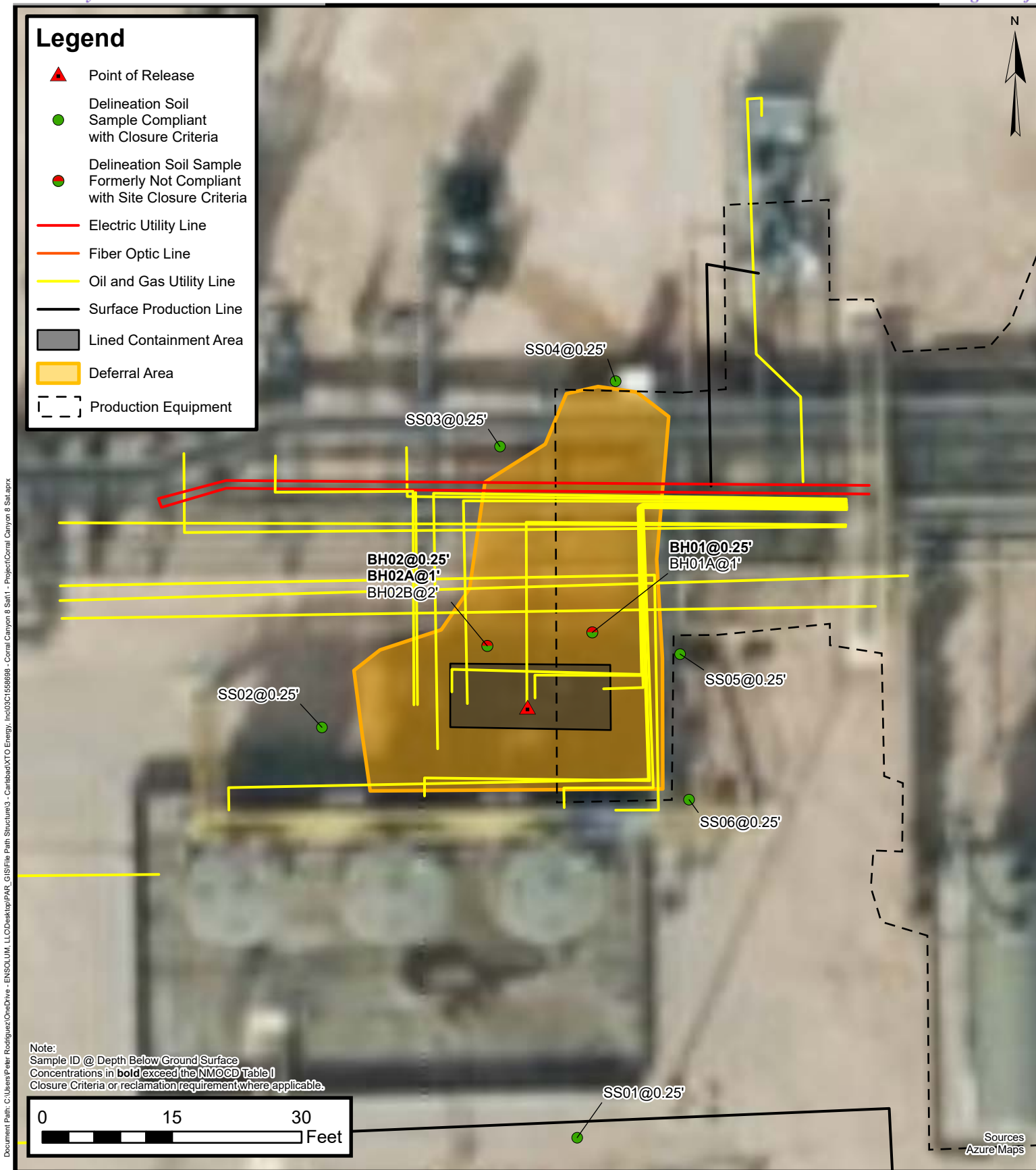
cc: Colton Brown, XTO
Kaylan Dirkx, XTO
New Mexico State Land Office

Appendices:

Figure 1 Requested Area of Deferral
Figure 2 Engineering Schematic
Appendix A Engineering Models



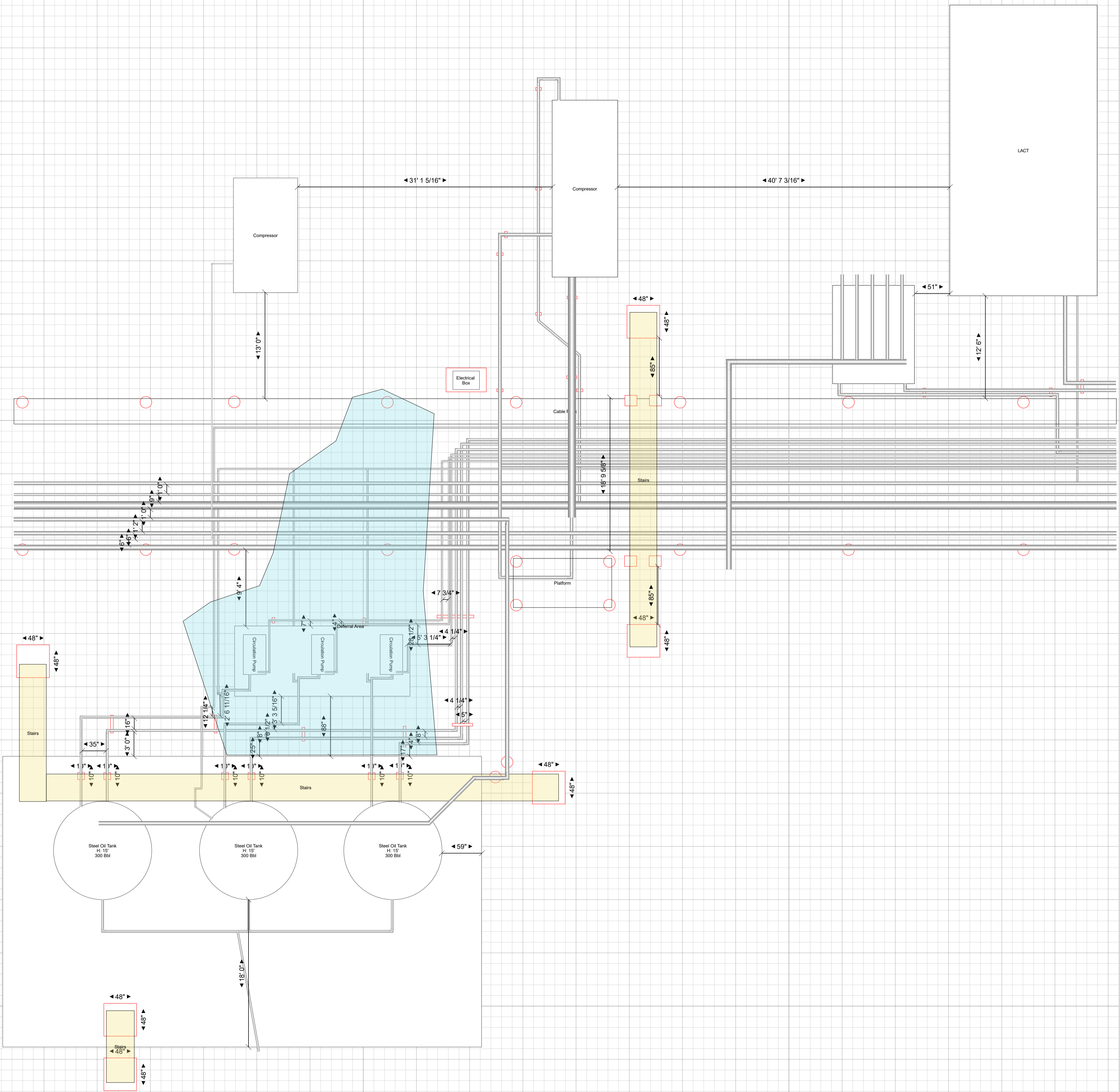
FIGURES



Requested Area of Deferral

XTO Energy, Inc
 Corral Canyon 8 Sat
 Incident Number: nAPP2518148302
 Unit K, Section 08, T25S, R29E
 Eddy County, New Mexico

FIGURE
 1



Site:	Corral Canyon 8	Drawing:	801506	Project:	03C1558698	Drawn:	Tracy Hillard	Notes:		Ensolum, LLC
Title:	Figure 2 - Engineering Schematic	Scale:	1/4"=1'0"	Date:	09/20/2025	Rev:	A			8330 LBJ Freeway St 830
										Dallas, TX 75243



Appendix A Engineering Models

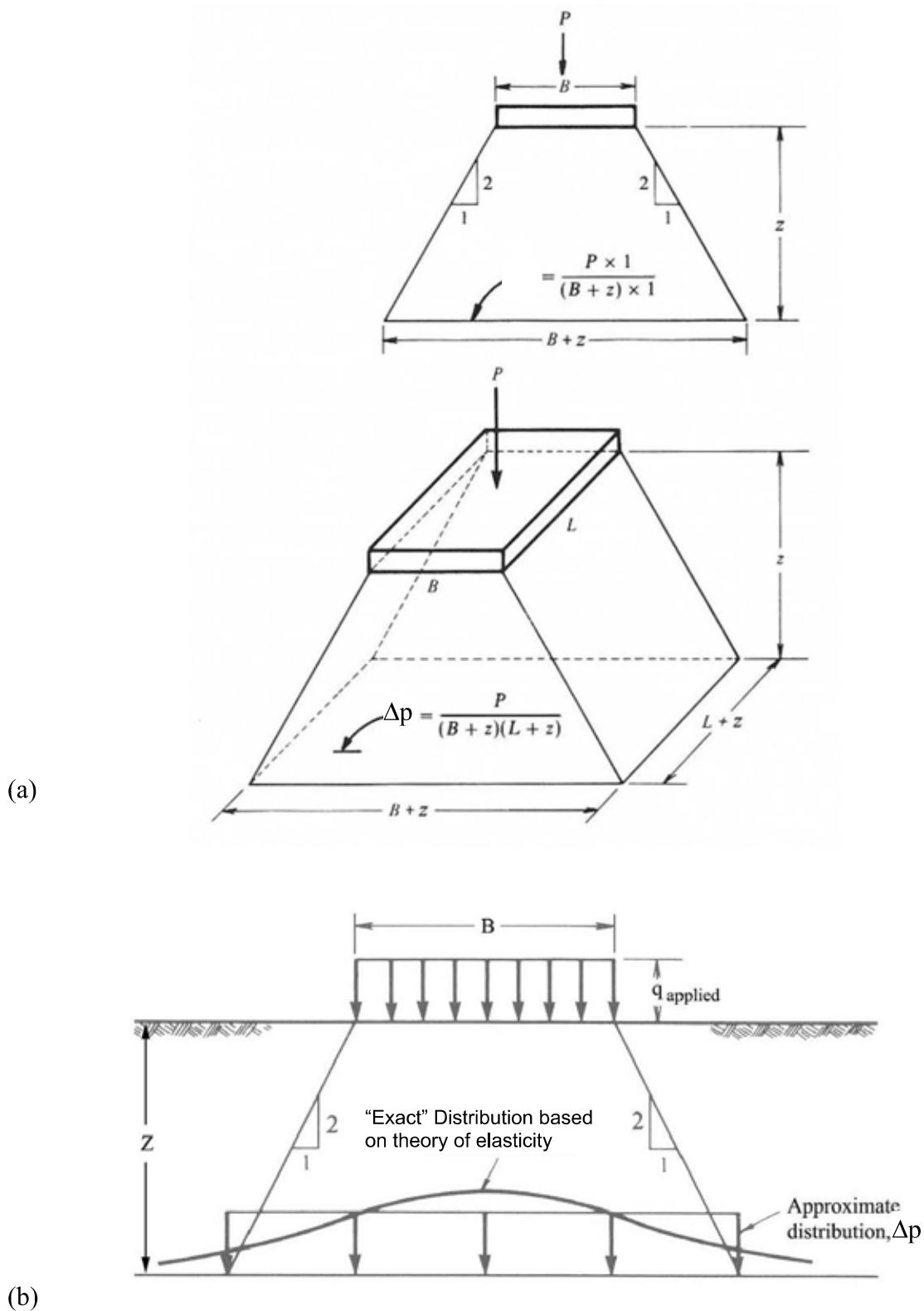


Figure 2-10. Distribution of vertical stress by the 2:1 method (after Perloff and Baron, 1976).

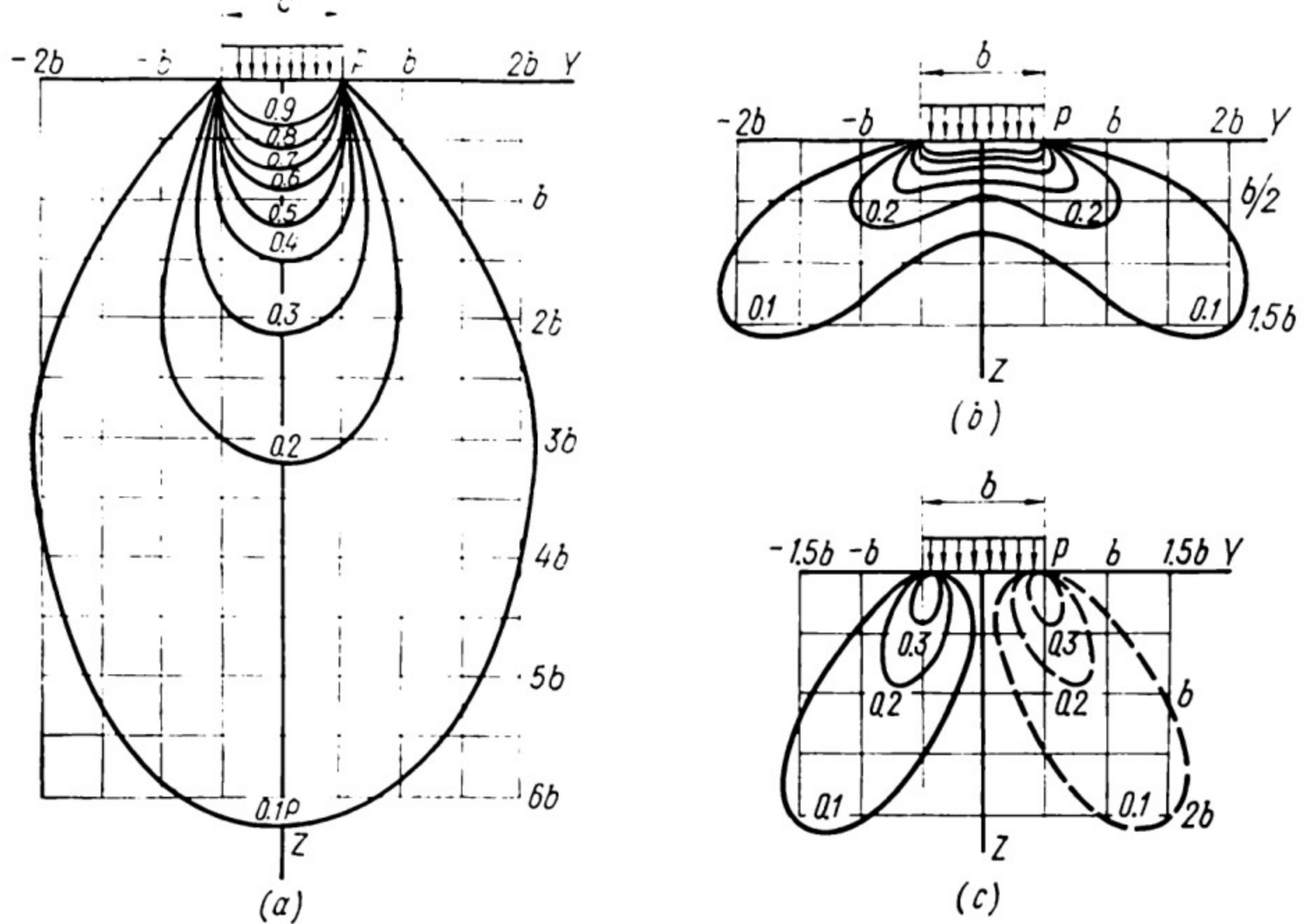
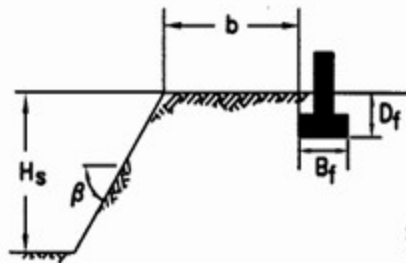


Fig. 49. Lines of equal stresses in a linearly deformable massif for the planar problem

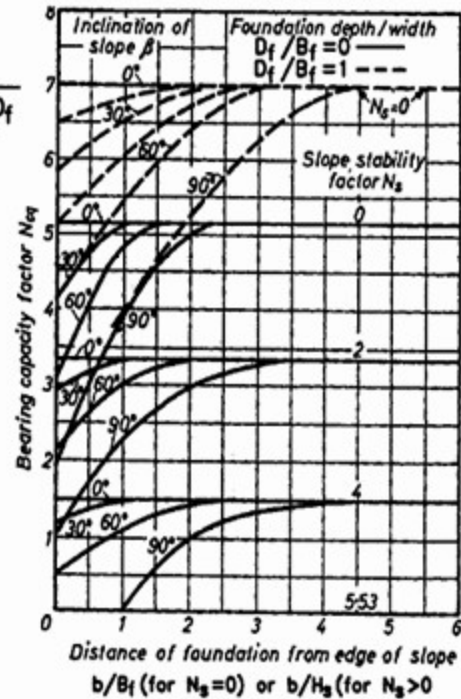
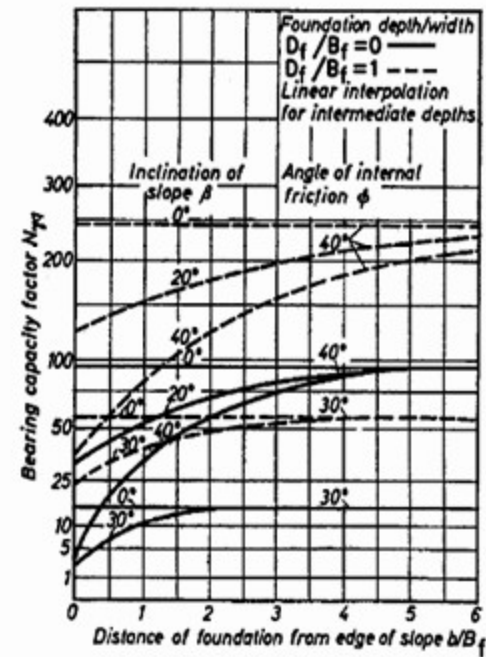
(a) isobars σ_z ; (b) lateral pressure σ_y ; (c) shears $\tau_{z,x}$



$$N_s = 0 \text{ (FOR } B_f < H_s)$$

$$N_s = \frac{\gamma H_s}{c} \text{ (FOR } B_f \geq H_s)$$

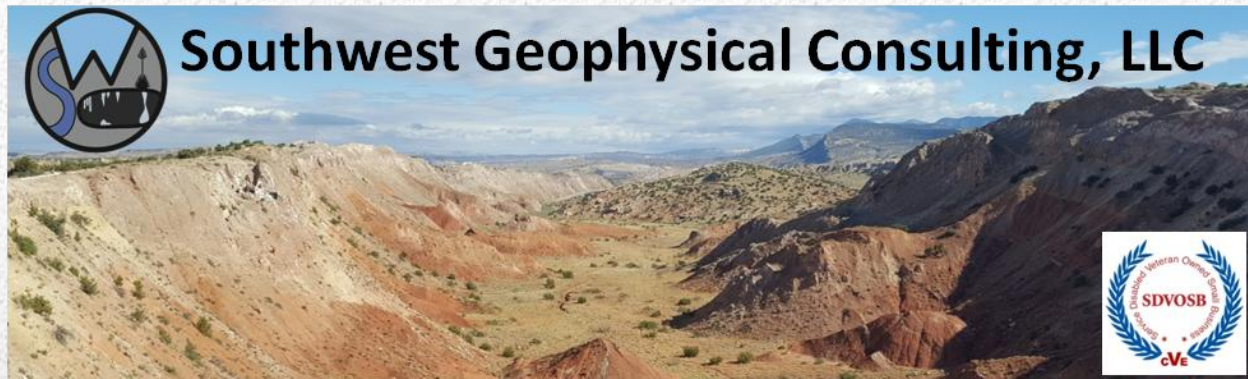
(d) Geometry

(e) Cohesive Soil ($\phi=0$)(f) Cohesionless Soil ($c=0$)



APPENDIX G

Environmental Karst Survey Study Report



Environmental Karst Study Report XTO Corral Canyon 8 Satellite Eddy County, New Mexico

**Prepared For:
Ensolum, LLC
3122 National Parks Highway
Carlsbad, NM 88220**

- ☐ Positive within 200 feet of spill delineation boundary
- ☒ Negative within 200 feet of spill delineation boundary
- ☒ Stable ☐ Unstable Ground
- ☐ Karst Monitor Recommended

August 15, 2025

ENS-018-20250609

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1.0 INTRODUCTION

This report was commissioned by Ensolum, LLC (hereinafter referred to as "the client"), on June 9, 2025, for the purpose of conducting an environmental karst study within an area encompassing the XTO Corral Canyon 8 Satellite project site (hereinafter termed "XCC8") centered at N 32.142567° W 104.006681°.

1.1 Goals of this Study

The goals of this study are to conduct a surface karst inventory and provide the client with the location and description of any surface karst features located within 200 feet (61 meters) of the spill delineation boundary (as defined by 19.15.29.12 NMAC^[1]), and to determine whether stable ground exists (as defined by 19.15.2 NMAC Definitions^[2]) within the spill boundary of the XTO Corral Canyon 8 Satellite project as provided by the client via e-mail (XCC8_INF_UTM13.kmz) on June 17, 2025, using electrical resistivity imaging^[3].

1.2 Summary of Findings

- **No surface karst features exist within the 200-foot (61-meter) perimeter of the spill delineation boundary.**
- **No anomalies consistent with subsurface air-filled voids were found within the XCC8 resistivity survey area.**
- **Flat-lying stratigraphy is interpreted to exist beneath the area where the geophysical survey was conducted, indicating stable ground.**

1.3 Affected Environment

The XCC8 project site is located in evaporite karst terrain, a landform that is characterized by underground drainage through solutionally enlarged conduits. Evaporite karst terrain may contain sinkholes, sinking streams, caves, and springs. Sinkholes leading to underground drainages and voids are common. These karst features, as well as occasional fissures and discontinuities in the bedrock, provide the primary sources for rapid recharge of the groundwater aquifers of the region. Additionally, karst may develop by hypogene processes involving dissolution by upwelling fluids from depth independent of recharge from the overlying or immediately adjacent surface. Hypogene karst systems may not be connected to the surface and can remain undiscovered unless encountered during drilling or excavation.

Karst features are delicate resources that are often of geological, hydrological, biological, and archeological importance, and should be protected. The four primary concerns in these types of terrain are environmental issues, worker safety, equipment damage, and infrastructure integrity.

The Bureau of Land Management (BLM) categorizes all areas within the Carlsbad Field Office (CFO) zone of responsibility as having either low, medium, high, or critical cave potential based on geology, occurrence of known caves, density of karst features, and potential impacts to freshwater aquifers^[4]. These designations are also recognized by the New Mexico State Land Office (NMSLO). This project occurs within a **MEDIUM** karst occurrence zone (MKOZ)^[5] (**Figure 1**).



Figure 1: Karst occurrence zone overview. Background image credit: Google Earth. Image date: August 21, 2024. Image datum: WGS-84.

A medium karst occurrence zone is defined as an area in known soluble rock types that may have a shallow insoluble overburden. These areas may contain isolated karst features such as caves and sinkholes. Groundwater recharge may not be wholly dependent on karst features, but the karst features still provide the most rapid aquifer recharge in response to surface runoff^[4].

Due to the rapidity with which evaporite karst develops, each location within a BLM-CFO designated karst occurrence zone must be assessed on an individual basis to determine the existence of surface karst features and the possibility of sub-surface karst development each time a release occurs.

1.4 Limitations of Report

This report should be read in full. No responsibility is accepted for the use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

This report has been prepared for the use of Ensolum, LLC, in accordance with generally accepted consulting practices. Every effort has been made to ensure the information in this report is accurate as of the time of its writing. This report has not been prepared for use by parties other than the client, their contracting party, and their respective consulting advisors. It may not contain sufficient information for the purposes of other parties or for other uses.

This report was prepared upon completion of the associated fieldwork using a standard template prepared by Southwest Geophysical Consulting and is based on information collected prior to fieldwork, conditions encountered on site, and data collected during the fieldwork and reviewed at the time of preparation. Southwest Geophysical Consulting disclaims responsibility for any changes that might have occurred at the site after this time. The interpreted results, locations, and depths noted in this report (if applicable) should be taken as an interpretation only and no decision should be based solely on this information. Physical verification of aerial imagery analysis results in the field should be conducted prior to using this information for remediation planning. Physical verification of geophysical results using geotechnical methods should be conducted.

To the best of our knowledge, the information contained in this report is accurate at the date of issue. Due to the nature of karst terrain, the information in this report shall not be used beyond two years past the date of the field work provided in section **2.3 Description of Survey**. Large weather events can shorten this time period as areas subject to karst development can rapidly form new features subsequent to these events.

2.0 LOCATION AND DESCRIPTION OF STUDY AREA

2.1 Description of Site

The site is located 11.1 kilometers (6.9 miles) southeast of Malaga, New Mexico, east of US Highway 285 and northwest of Pipeline Road Number 1. The release site is located within section 8, NM T25S R29E^[6] (**Figure 1** and **Figure 2**). The region has flat-lying terrain with karstification occurring in the gypsite soils and underlying gypsum and dolomite bedrock^[7] (see section **2.2 Local Geology Summary** for further information). The climate in this area of southeast New Mexico is semi-arid with an average annual precipitation of approximately 13 inches, of which about two-thirds falls as rain during summer thunderstorms from June to October. Summers are hot and sunny while winters are generally mild, with an average maximum temperature of 96°F in July and an average minimum temperature of 28°F in January^[8]. This area is within the Chihuahuan Desert Thornscrub as defined by the Southwestern Regional ReGAP Vegetation map^[9] and the vegetation consists mostly of areas of blue grama, nine-awned pappus grass, burro grass and low scrub including yucca. The spill delineation boundary is located within an MKOZ^[5] (**Figure 1**) and within BLM-CFO managed land^[10] (**Figure 2**).



Figure 2: Land ownership and PLSS overview. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

2.2 Local Geology Summary

The site for the XCC8 survey is located at an elevation of 903 meters (2,961 feet), \pm 6 meters (19 feet), and is located within a region underlain by the Permian Rustler Formation (Pru). The area is mantled by thin gypsiferous soils (gypsite), Quaternary alluvium (Qal), and eolian deposits (Qe)^[11] up to 5 meters in depth (**Figure 3**).

The Rustler Formation is an evaporite facies composed mainly of thin siltstones and sandstones interbedded with claystones, dolomite, and gypsum, and contains both karst-forming strata (the Forty-niner and Tamarisk members) and two shallow aquifers (the Magenta and Culebra Dolomite members)^[12].

The Pru overlies the Permian Salado Formation (Psl) (not shown on map as it does not outcrop in the survey area), a layer of extremely soluble halite which can readily dissolve to create caves, sinkholes, and other karst features; however, due to its extremely soluble nature, only non-soluble silt and sand remain from the dissolution of this layer at the surface^[12]. The Rustler Formation may be subject to collapse if a void has developed beneath it in the Salado Formation^[13].

The survey area is covered by the easily accessible Geologic Map of New Mexico (2003) at 1:500,000 scale^[14] and the Digital Geologic Map of New Mexico in ARC/INFO Format^[11].



Figure 3: Geology overview. Geology map credit: The Digital Geologic Map of New Mexico in ARC/INFO Format. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

2.3 Description of Survey

2.3.1 Surface Karst Survey

Southwest Geophysical Consulting, in partnership with SWCA Environmental Consultants, provides surface karst surveys using small, uncrewed aerial systems (sUAS) that are flown by qualified, FAA licensed drone pilots and that meet the stringent Bureau of Land Management – Carlsbad Field Office requirements for both pedestrian and aerial karst surveys.

The surface karst survey includes a desk study prior to the flight which allows us to provide client feedback in the event of any previously known karst features in the area. The desk study is performed out to 305 meters (1,000 feet) from the spill delineation boundary per New Mexico Oil Conservation Division guidance^[1] (**Figure 4**). The study was performed using satellite and aerial imagery from Google Earth Pro dated March 20, 2023 (please note features less than one meter in diameter are generally not visible using this method); the Southwest Geophysical Cave and Karst Database dated December 23, 2024^[15]; the Malaga, NM, 1:24,000 quad, 1985, USGS topographic map; and the latest lidar imagery from CalTopo.com. Please note that we use older topographic maps because newer maps have had caves removed from them. These searches and queries returned no surface karst features within the 305-meter survey boundary.

Surface karst surveys are conducted by sUAS at low elevation within 200 meters of the spill delineation boundary^[3] (**Figure 4**) following a preplanned raster pattern flightpath designed for the purpose of generating at least 75% imagery overlap. The collected high-resolution, georeferenced imagery is stitched together to develop orthomosaic imagery which is further developed into a digital elevation model (DEM); the DEM is then processed into a local relief model (LRM) (**Figure 6**). This LRM is color coded to enhance differences in elevation of as little as five centimeters. The orthoimagery, DEM, and LRM are uploaded to a server where they are analyzed by an experienced karst geologist. Finally, the data is reviewed by a senior karst geologist for quality assurance and downloaded into a table for inclusion in a written report^[16].

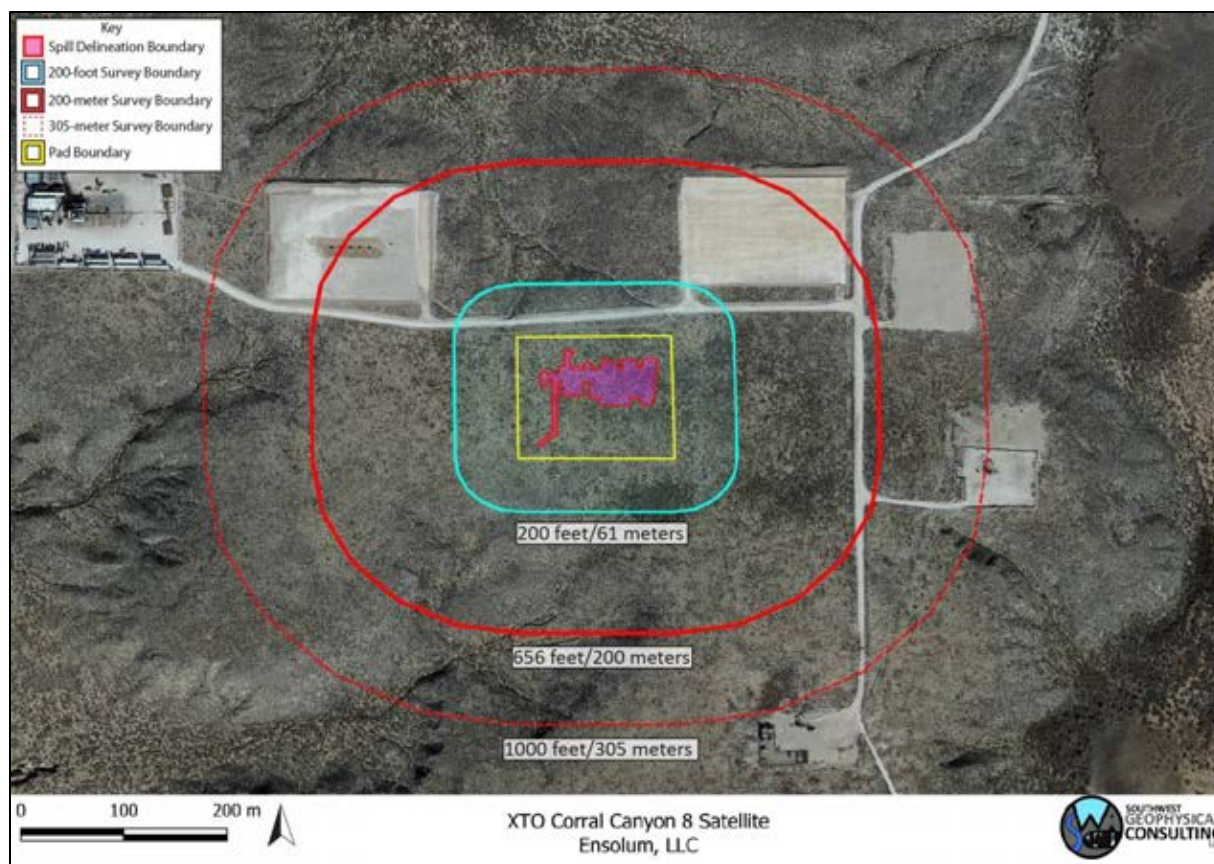


Figure 4: Surface survey overview. Background image credit: Google Earth. Image date: January 27, 2023. Datum: WGS-84.

The resolution of the orthoimagery is clear enough that features as small as 10 centimeters can be positively identified in most circumstances. Occasionally there are ambiguous features identified during an aerial survey that will need to be checked in the field if they are impacted by the proposed remediation efforts. Specifically, it is difficult to tell the difference between solution tubes, abandoned uncased well bores, and some burrows in drone imagery. If an ambiguous feature is located during imagery analysis, it is marked with a yellow dot in **Figure 6**. If a feature of any likelihood is subsequently verified in the field prior to publication of the report, the dot will be changed to a red triangle if confirmed as a karst feature or deleted if not.

The imagery for this study was collected via aerial survey by Pat Lagodney of SWCA on July 8, 2025. Surface karst features may have developed after this date and will not be noted in this report. Imagery analysis was completed by Dave Decker of Southwest Geophysical Consulting on July 24, 2025.

2.3.2 Geophysical Survey

For this survey, an ABEM Terrameter LS 2, two 42-electrode, and one 56-electrode array of 40-centimeter-long electrodes were used to image the subsurface. This survey consisted of three resistivity lines in a dipole-dipole configuration: line XCC801 was laid out south to north, line XCC802 was laid out west to east, and XCC803 was laid out south to north. Line XCC801 consisted of 56 electrodes at 5-meter spacing resulting in a 275-meter-long array and lines XCC802 and XCC803 both consisted of 42 electrodes at 5-meter spacing resulting in 205-meter long arrays (**Figure 5, Table 1**). A preconfigured command file was used to run the data collection (DipoleDipole4x14). The 56-electrode configuration provided a depth of investigation of 55 meters (180 feet) with a resolution of 2.0 to 2.5 meters (6.6 to 8.2 feet). The 42-electrode configuration provided a depth of investigation of 33 meters (108 feet) with a resolution of 2.0 to 2.5 meters (6.6 to 8.2 feet) within the first 5 to 8 meters (16 to 26 feet) from the surface. A Leica GS18 GPS was used to record electrode locations and elevations.

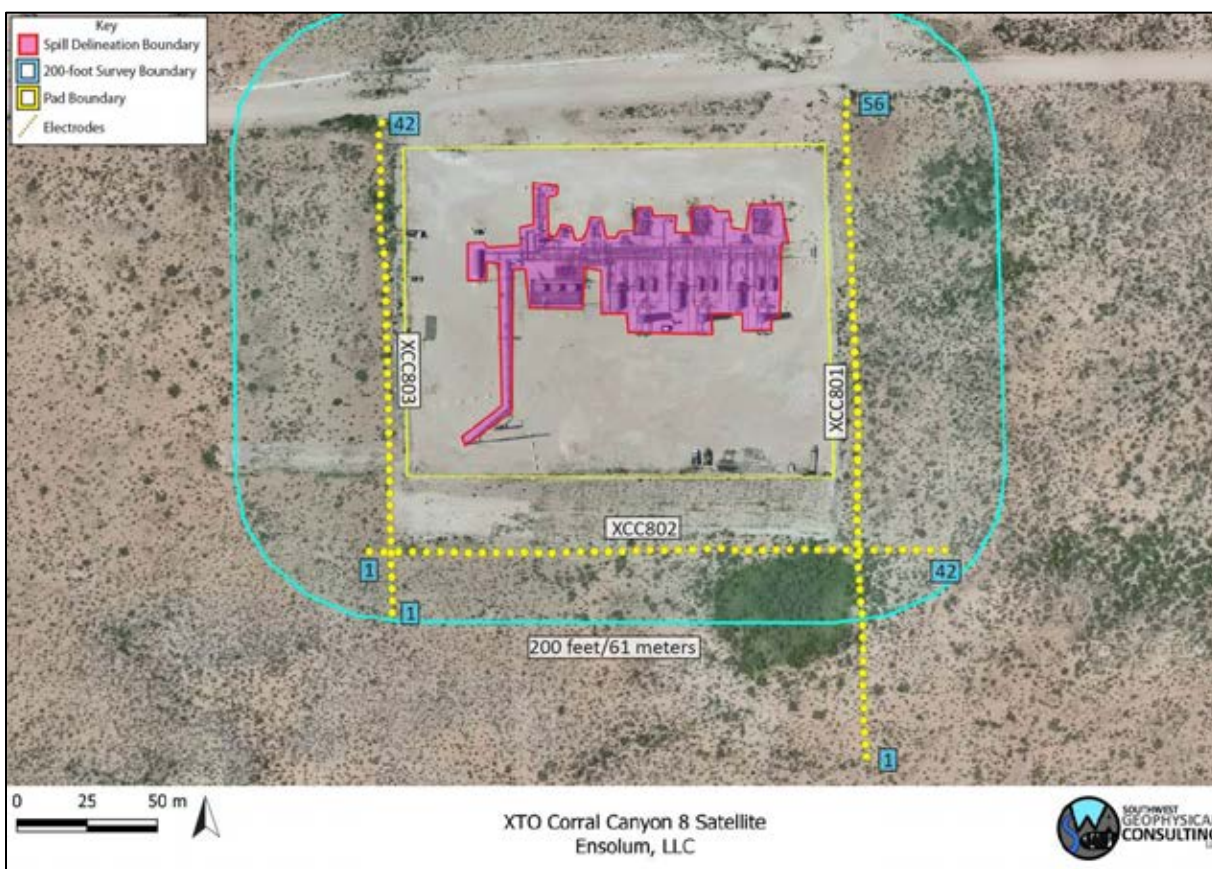


Figure 5: Geophysical survey overview. XCC801 was conducted with 56 electrodes at 5-meter spacing, and both XCC802 and XCC803 were conducted with 42 electrodes at 5-meter spacing (yellow dots denoted with blue numbers). Background image credit: Google Earth. Image date: January 27, 2023. Image datum: WGS-84.

Table 1 provides basic line data. Detailed information for each line including electrode number, location in latitude/longitude (decimal degree format), and elevation in meters can be found in the accompanying data files.

Table 1: Survey Line Data Table. The XCC8_ERI_Points.kmz file contains all the points for the survey line listed in the file name. These data are available in the accompanying files XCC8_ERI_Points.xlsx and ENS-018-20250609_XCC8_Data_Files.kmz.

File Name:	Completed By:	Date:
XCC801.kmz	Steven Kesler – Field Geologist	7/16/2025
XCC802.kmz	Kat Knight – Field Geologist	
XCC803.kmz	Michael Jones – Field Geologist	

EarthImager™ 2D software was used to download and process the data and to provide the model used to make our interpretations. The design of the survey and the orientation of each of the lines provides the information necessary to make the determination of “stable” or “unstable” ground at this site.

A typical starting model was used for the data processing due to the two-layer model of the geology in the area; specifically, generally high-resistivity gypsum and dolomite at the surface and low-resistivity saturated gypsum and dolomite bedrock at depth. The starting model used was “average apparent resistivity” and a default inversion setting of “surface,” with a minimum apparent resistivity set to 0.1 Ohm-meters (Ohm-m or Ω -m) and a max apparent resistivity set to 100,000 Ω -m (**Table 2**).

Table 2: Software Information and Settings

Software Name:	EarthImager™ 2D
Version:	2.4.4.649
Starting Model:	Average Apparent Resistivity
Default Inversion Settings:	Surface
Changes to Default Inversion Settings:	Max Apparent Resistivity = 100 k Ω -m Min Apparent Resistivity = 0.1 Ω -m

Note: Raw data files (.stg files for EarthImager™ 2D) and processed data (.trn files, terrain files for surface correction in EarthImager™ 2D and .out files, the processed .stg files) are available upon request.

All field work, including setup, stow, and travel, was completed by Steven Kesler, Kat Knight, and Michael Jones on July 16, 2025.

3.0 RESULTS

3.1 Surface Karst Survey

The desk study and surface karst survey located no surface karst features within the 200-foot (61-meter)^[1] survey boundary (Figure 6).

No surface karst features exist within the **200-meter** survey boundary, and no springs exist within the 305-meter (1,000 foot) survey boundary^[1].

The lack of surface karst features does not mean the area is not karstified and the survey area may still contain buried karst features. Caution should be exercised while clearing brush and during any excavation, trenching, or construction operations. Employing a Bureau of Land Management approved karst monitor on site during these operations should be considered.

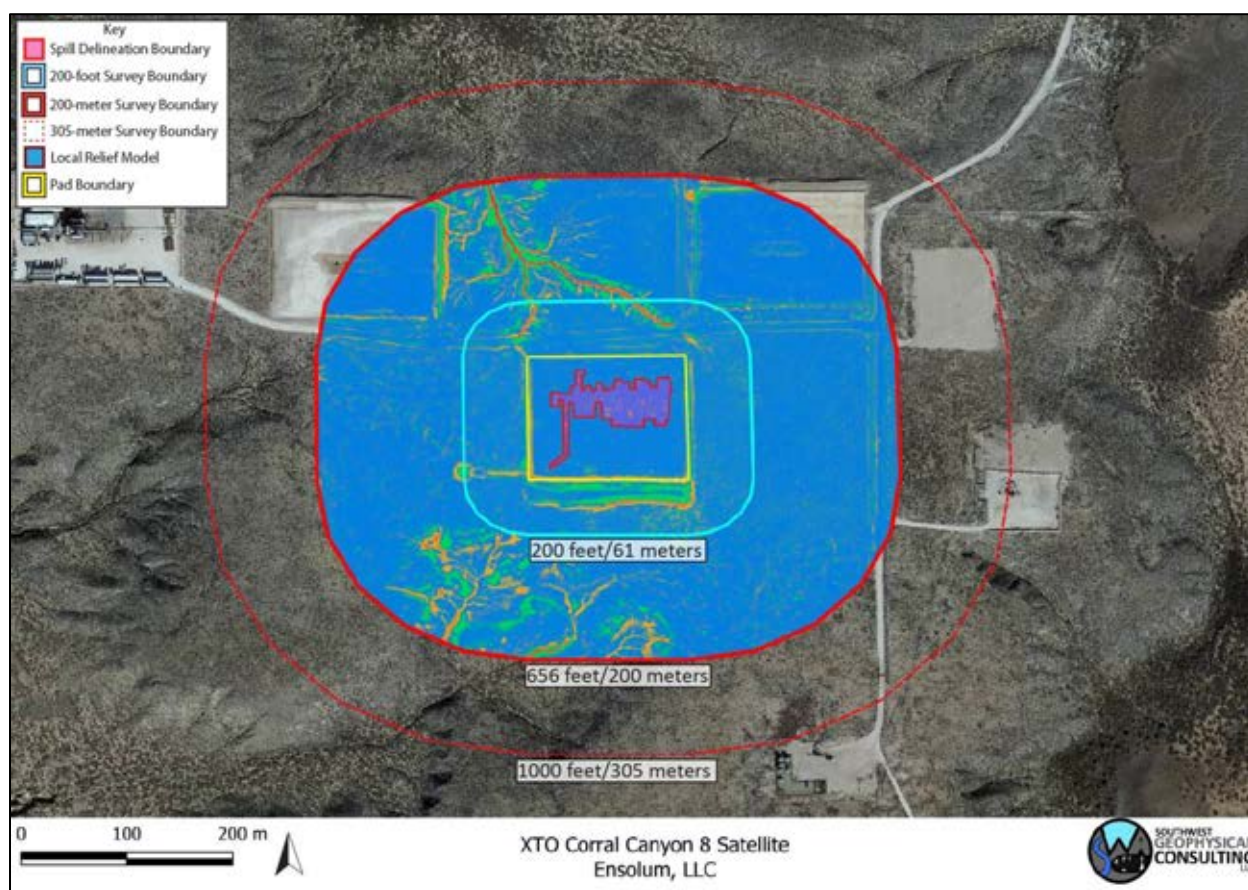


Figure 6: UAS-conducted surface karst survey results. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

3.2 Geophysical Survey

Electrical resistivity tomography forms images of the subsurface by causing a current to flow through the rock and soil and then measuring the resistance of these materials as the current flows through them. This measurement is taken many times and the resulting data, once processed, is used to produce a model of the subsurface (**Figure 7**). This model is produced using "non-unique" solutions, which means that there are many models and interpretations which will satisfy the data. Using experience and knowledge of the local geology, a high-confidence model can be established and used to develop an accurate understanding of what lies below the surface. This survey was conducted with the express purpose of locating subsurface voids and does not purport to find paleokarst (old, non-active karst features that have been filled in with sand and sediment) or nascent karst features below the resolution limit of the survey.

The results of this study indicate a moderately stable geologic system with resistivities between 0.33 and 5,447 Ohm-m with occasional resistivities to 100,000 Ohm-m (**Figure 7**). These high-resistivity anomalies are interpreted to be noise associated with nearby infrastructure. **No anomalies interpreted as underground voids were found in the XCC8 survey area.** Please keep in mind when viewing the 2D inverted resistivity sections that color maps can be widely different for each view. Always check the color map located on the right side of the image when viewing the 2D images to ensure you understand the range of resistivities presented. Distances along the top and depths along the left side are in meters. The color map along the right side is in Ohm-m. Due to the nature of the survey, shallower zones have higher resolution between electrodes than deeper zones; therefore, small features at depth will not be visible.

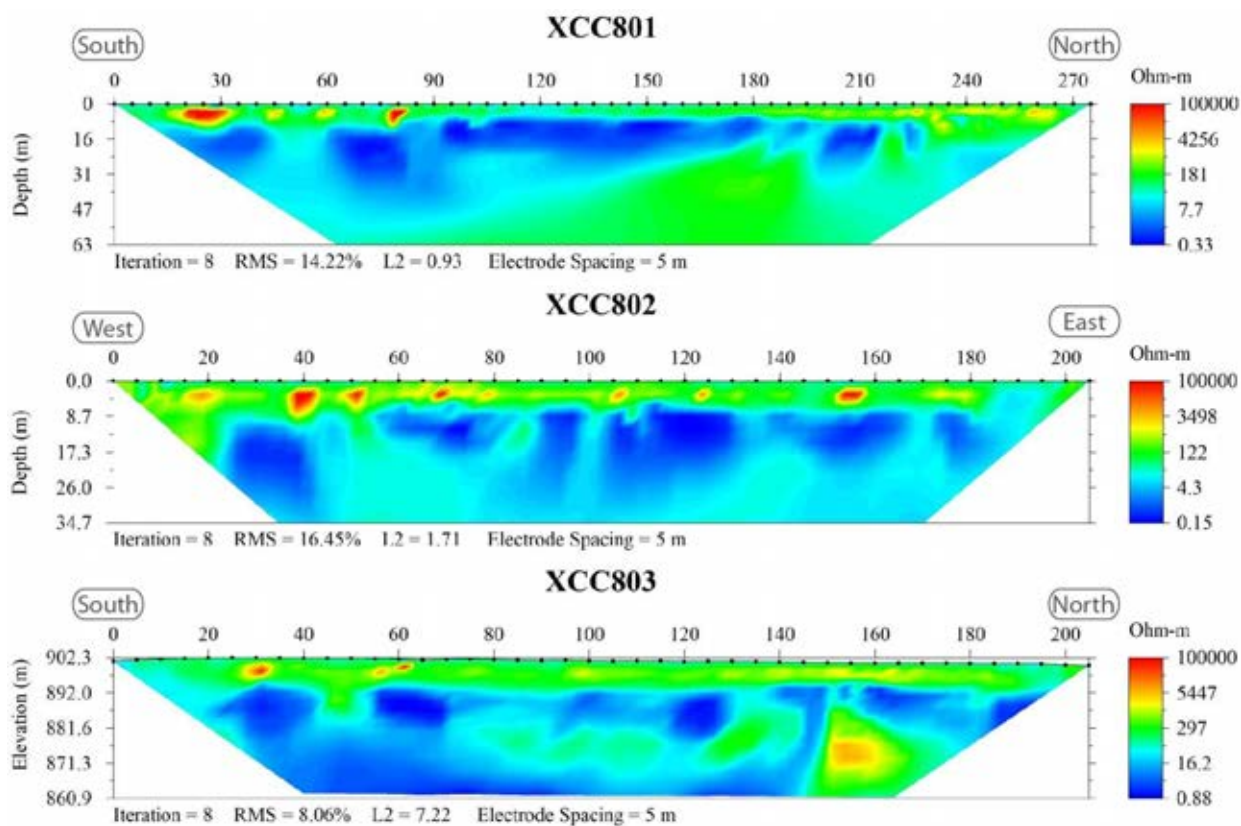


Figure 7: 2D inverted resistivity sections. Reds and oranges indicate higher resistivity values. Yellows and greens are medium-resistivity values. Blues are low-resistivity values. Please note that the color scale is relative.

4.0 DISCUSSION

No anomalies interpreted as large near-surface voids are located within the study area. However, due to the resolution limit of the survey, other small voids at or near the resolution limit (2.5 – 3.0 meters) cannot be ruled out. The extremely high-resistivity areas (100,000 Oh-m) on these lines are interpreted as noise associated with nearby infrastructure. Other moderately high resistivity areas located less than 10 meters beneath the surface are interpreted as dry caliche or gypsite soils; due to their low resistivity values when compared with significant subsurface voids, these features should not be a concern for construction of any well pad infrastructure. Areas of moderate resistivity (yellows and greens) near the surface are interpreted as dry caliche soils and gypsum or dolomite bedrock of the Rustler Formation (**Figure 7** and **Figure 8**).

Resistivity of the survey area drops below 50 Ω -m at approximately 12 - 15 meters (39.4 – 49.2 feet) depth and generally increases to greater than 500 Ω -m below these depths throughout the survey area, indicating a change from moist to saturated caliche/gypsite soils or gypsums to the bedrock of the Rustler Formation (**Figure 7** and **Figure 8**).

Please remember that these are interpretations made from knowledge of the local subsurface materials and experience. **They remain interpretations until verified by geotechnical methods.**

Within karst terrains like the project site, small air- or sediment-filled voids and/or brecciated zones and solutionally enlarged fractures that are below the resolution limit of the survey may exist; these may be encountered during excavation and if so, should be evaluated by a karst specialist prior to continuation of the excavation. Employing a BLM-CFO approved karst monitor on site during excavation in this area should be considered.

Fracture sets within the subsurface can act as hydrologic pathways to the water table. Rapid dissolution of gypsum can occur along these pathways creating solution-enlarged fractures, and in some cases, voids within months to years. For this reason, this survey is valid only for this remediation event.



Figure 8: Data overlay. Colored trapezoids are 2D inverted resistivity lines. Background image credit: Google Earth. Image date: January 27, 2023.

5.0 SUMMARY

- The XCC8 survey contains no surface karst features within 200 feet (61 meters) of the spill delineation boundary.
- The XCC8 survey contains no subsurface anomalies which are interpreted as karst-related features within 200-feet (61 meters) of the spill delineation boundary.
- Flat-lying stratigraphy is interpreted to exist beneath the area where the geophysical survey was conducted, indicating stable ground.
- Employing a BLM-CFO approved karst monitor during excavation at this site should be considered.

6.0 DISCLOSURE STATEMENT

Karst occurrence zones are prone to rapid karst formation and warrant careful planning and engineering to mitigate karst-forming processes that could be accelerated by removal of surface cover or the vibrations associated with heavy equipment used in the remediation process.

Mitigation measures for any karst features revealed during excavation shall be approved by the Bureau of Land Management – Carlsbad Field Office and follow the Natural Resources Conservation Service Conservation Practice Standard for Karst Sinkhole Treatment, Code 527, or the Bureau of Land Management Cave and Karst Management Handbook, H-8380-1.

Vigilance during remediation activities is paramount. If voids are encountered during excavation, contact the Bureau of Land Management Karst Division at (575) 234-5972, the New Mexico State Land Office Surface Resources Division at (505) 827-5768, or a BLM-CFO approved karst contractor and request an on-site investigation from a karst expert if one is not already on site. A karst consultant can generally be available in Eddy County within five hours.

Approved karst monitors should have karst feature identification training, at least two years of supervised experience identifying karst features, wilderness first aid training, SRT training, confined space training, gas monitor training, and a minimum of SPAR cave rescue training through NCRC. They should have with them the proper gear and be prepared both physically and mentally to enter a collapse feature within minutes to perform a rescue if needed.

Monitoring services with qualified karst monitors, as well as cave surveys and geophysical surveys, are available from Southwest Geophysical Consulting.

Under no circumstances should an untrained, inexperienced person enter a cave, pit, sinkhole, or collapse feature. All field employees of Southwest Geophysical Consulting have extensive caving experience and the ability to determine whether entry into a karst feature is safe or presents a hazard. In the event it is necessary to enter a karst feature, Southwest Geophysical Consulting can provide these services on request.

Cave and karst resource inventory reports, karst feature investigations, and geophysical reports commissioned at the request of the land manager should be submitted to the BLM-CFO at blm_nm_karst@blm.gov.

Cave and karst resource inventory reports for the NMSLO should be submitted to the respective project manager.

Environmental karst reports should be submitted to the appropriate project manager at the New Mexico Oil Conservation Division.

7.0 REFERENCES

- 1 Division, O. C. *Title 19, Chapter 15, Part 29* (Oil Conservation Division, 2018).
- 2 NMSLO. (ed Oil Conservation Division) (New Mexico State Land Office, Santa Fe, NM, 2018).
- 3 Decker, D. & Jorgensen, G. L. *Environmental Karst Surveys White Paper* (Southwest Geophysical Consulting, LLC, 2024).
- 4 Goodbar, J. R. Vol. BLM Management Handbook H-8380-1 (ed Carlsbad Field Office) 59 (Bureau of Land Management, Denver, CO, 2015).
- 5 Decker, D., Trautner, E. & Palmer, R. (Bureau of Land Management - Carlsbad Field Office, 2025).
- 6 Earthpoint. *Earthpoint Tools for Google Earth*,
<<https://www.earthpoint.us/Townships.aspx>> (2022).
- 7 Decker, D. D., Land, L. & Luke, B. Characterization of Playa Lakes in the Gypsum Karst of Southeastern New Mexico and West Texas, USA. *Oklahoma Geological Survey Circular 113* **113** (2021).
- 8 W.R.C.C. *National Climate Data Center 1981-2010 Normal Climate Summary for Carlsbad, New Mexico (291469)*, (2010).
- 9 Whitehead, W. & Flynn, C. *Plant Utilization in Southeastern New Mexico: Botany, Ethnobotany, and Archaeology*. (Bureau of Land Management, Carlsbad Field Office, 2017).
- 10 NMSLO. Digital overlay (KML) of the surface land ownership in New Mexico (New Mexico State Land Office, Santa Fe, NM, 2024).
- 11 Green, G. N. & Jones, G. E. *The Digital Geologic Map of New Mexico in ARC/INFO Format*, <<https://mrdata.usgs.gov/geology/state/state.php?state=NM>> (1997).
- 12 Austin, G. S. *Geology and mineral deposits of Ochoan rocks in Delaware Basin and adjacent areas*. Vol. Circular 159 (New Mexico Bureau of Mines and Mineral Resources, 1978).
- 13 Johnson, K. S. Evaporite Karst in the United States. *Carbonates and Evaporites* **12**, 2-14 (1997).
- 14 Scholle, P. A. *Geologic Map of New Mexico*. (2003).
- 15 Decker, D. D., Jorgensen, G. L. & Palmer, R. in *Southwest Geophysical Cave and Karst Database* (ed LLC Southwest Geophysical Consulting) (Albuquerque, NM, 2025).
- 16 Whitehead, W., Bandy, M. & Decker, D. Protocol for Using UAV Photography for Rapid Assessment of Karst Features in Southeast New Mexico. *Proceedings of the 2022 Cave and Karst Management Symposium* (2022).

8.0 GLOSSARY OF TERMS

AGI	Advanced Geosciences Inc.
BLM-CFO	Bureau of Land Management - Carlsbad Field Office
brecciated	Fractured rock caused by faulting or collapse.
caprock-collapse sinkhole	Collapse of roof-spanning rock into a cave or void.
cave	Natural opening at the surface large enough for a person to enter.
cover-collapse sinkhole	Collapse of roof-spanning soil or clay ground cover into a subsurface void.
ERI	Electrical Resistivity Imaging
GPS	Global Positioning System
grike	A solutionally enlarged, vertical, or sub-vertical joint or fracture.
(H)	High confidence modifier for a PKF. This is typically reserved for a feature that is definitely karst but has not been confirmed in the field.
HKOZ	High Karst Occurrence Zone
karst	A landscape containing solutional features such as caves, sinkholes, swallets, and springs.
(L)	Low confidence modifier for a PKF. This is typically a feature that cannot be ruled out as karst but is most likely NOT karst related. This modifier may also be used for pseudokarst features.
(M)	Medium confidence modifier for PKF. This is an ambiguous feature that can't be positively identified as karst without a field visit (e.g., burrows, abandoned unlined wells, solution tubes, pseudokarst).
MKOZ	Medium Karst Occurrence Zone
NCRC	National Cave Rescue Commission
NKF	Non-karst feature. Used for features originally identified as PKF that have been subsequently identified in the field as non-karst related. This term may also be used for pseudokarst features.
NMSLO	New Mexico State Land Office
Ohm-m	Ohm-meter, a unit of measurement for resistivity. Sometimes abbreviated Ω -m.
paleokarst	Previously formed karst features that have been filled in by erosion and/or deposition of minerals.
Pat	Permian Artesia Group
Pc	Permian Capitan Formation
Pcs	Permian Castile Formation

PdI	Permian Dewey Lake Formation
PKF	Possible karst feature. This term is reserved for features identified in satellite or aerial imagery that have NOT been visited in the field. Further modifiers include (H) for high confidence, (M) for medium confidence, and (L) for low confidence. These confidence levels are based on field experience.
PLSS	Public Land Survey System
Pqg	Permian Queen/Greyburg Formation
Pru	Permian Rustler Formation
pseudokarst	Karst-like features (sinkholes, conduits, voids etc.) that are not formed by dissolution. These types of features include soil piping, lava tubes, and some cover-collapse and suffosion sinkholes.
Psl	Permian Salado Formation
Psr	Permian Seven Rivers Formation
Pt	Permian Tansill Formation
Py	Permian Yates Formation
Qal	Quaternary alluvium
Qe	Quaternary eolian deposits
Qp	Quaternary piedmont deposits
Qpl	Quaternary playa lake deposits
RKF	Recognized karst feature. This term is reserved for karst features that have been physically verified in the field.
SPAR	Small Party Assisted Rescue
sUAS	Small, uncrewed aerial system
suffosion sinkhole	Raveling of soil into a pre-existing void or fracture.
swallet	A natural opening in the surface, too small for a person, that drains water to an aquifer. Some are "open," meaning a void can be seen below; some are "closed," meaning they are full of sediment.
SWG	Southwest Geophysical Consulting, LLC
UTM	Universal Transverse Mercator (projected coordinates)
(V)	Field verified modifier for a RKF. This indicates that the feature has been visited by a qualified karst professional in the field and fully identified
WGS	World Geodetic System (geographic coordinates)

9.0 ATTESTATION

David D. Decker, PhD, PG, CPG

Chief Executive Officer, Principal Geologist

Southwest Geophysical Consulting, LLC

5117 Fairfax Dr. NW

Albuquerque, NM 87114

dave@swgeophys.com

(505) 585-2550

CERTIFICATE OF AUTHOR

I, David D. Decker, a Licensed Professional Geologist and a Certified Professional Geologist, do certify that:

- I am currently employed as a consulting geologist in the specialty of caves and karst with an office address of 5117 Fairfax Dr. NW, Albuquerque, NM, USA, 87114.
- I graduated with a Master of Science in Applied Physics with a specialization in Sensor Systems from the Naval Post Graduate School in Monterey, California, in 2003, and a Doctor of Philosophy in Earth and Planetary Sciences from the University of New Mexico, Albuquerque, New Mexico, in 2018.
- I am a Licensed Professional Geologist in the State of Texas, USA (PG-15242) and have been since 2021. I am a Certified Professional Geologist through the American Institute of Professional Geologists (CPG-12123) and have been since 2021.
- I have been employed as a geologist continuously since 2016. I was previously employed as a Fire Controlman, Naval Flight Officer, and Aerospace Engineering Duty Officer in the U.S. Navy and operated, maintained, and installed various sensor systems including magnetic, electromagnetic, radar, communications, and acoustic systems in various capacities from 1986 through 2010.
- I have been involved in various aspects of cave and karst studies continuously since 1985, including exploration, mapping, and scientific studies.
- I have read the definition of “qualified karst professional” set out in the ASTM Standard Practice for Preliminary Karst Terrain Assessment for Site Development (ASTM E-1527). I meet the definition of “qualified professional” for the purposes of this standard.
- I am responsible for the content, compilation, and editing of all sections of report number ENS-018-20250609 entitled, “Environmental Karst Study Report, XTO Corral Canyon 8 Satellite, Eddy County, New Mexico.” I or a duly authorized and qualified representative of Southwest Geophysical Consulting, LLC, have personally visited this site and/or reviewed the aerial imagery on the date or dates mentioned in section **2.3 Description of Survey**.

- I have no prior involvement nor monetary interest in the described property or project, save for my fee for conducting this investigation and providing the report.

Dated in Albuquerque, New Mexico, August 16, 2025.



David D. Decker

PhD, CPG-12123



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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

QUESTIONS

Action 510139

QUESTIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 510139
	Action Type: [C-141] Deferral Request C-141 (C-141-v-Deferral)

QUESTIONS

Prerequisites	
Incident ID (n#)	nAPP2518148302
Incident Name	NAPP2518148302 CORRAL CANYON 8 SAT @ FAPP2207552359
Incident Type	Release Other
Incident Status	Deferral Request Received
Incident Facility	[fAPP2207552359] CORRAL CANYON 8 SAT

Location of Release Source

Please answer all the questions in this group.

Site Name	CORRAL CANYON 8 SAT
Date Release Discovered	06/29/2025
Surface Owner	Federal

Incident Details

Please answer all the questions in this group.

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

Nature and Volume of Release

Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.

Crude Oil Released (bbls) Details	Cause: Corrosion Gasket Crude Oil Released: 2 BBL Recovered: 1 BBL Lost: 1 BBL.
Produced Water Released (bbls) Details	Cause: Corrosion Gasket Produced Water Released: 3 BBL Recovered: 2 BBL Lost: 1 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
Condensate Released (bbls) Details	Not answered.
Natural Gas Vented (Mcf) Details	Not answered.
Natural Gas Flared (Mcf) Details	Not answered.
Other Released Details	Not answered.
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	0.5 bbls PO and 0.5 bbls PW were released on permeable surface, while the rest was released within impermeable containment

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Action 510139

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
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QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	More info needed to determine if this will be treated as a "gas only" report.
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	No
Reasons why this would be considered a submission for a notification of a major release	<i>Unavailable.</i>
<i>With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.</i>	

Initial Response

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

The source of the release has been stopped	True
The impacted area has been secured to protect human health and the environment	True
Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices	True
All free liquids and recoverable materials have been removed and managed appropriately	True
If all the actions described above have not been undertaken, explain why	<i>Not answered.</i>

Per Paragraph (4) of Subsection B of 19.15.29.8 NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of actions to date in the follow-up C-141 submission. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC), please prepare and attach all information needed for closure evaluation in the follow-up C-141 submission.

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

I hereby agree and sign off to the above statement	Name: Robert Woodall Title: Environmental Analyst Email: robert.d.woodall@exxonmobil.com Date: 09/29/2025
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Action 510139

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID:
	5380
	Action Number: 510139
	Action Type: [C-141] Deferral Request C-141 (C-141-v-Deferral)

QUESTIONS

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

Remediation Plan	
<i>Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.</i>	
Requesting a remediation plan approval with this submission	Yes
<i>Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.</i>	
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)	
Chloride (EPA 300.0 or SM4500 Cl B)	2250
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	10449
GRO+DRO (EPA SW-846 Method 8015M)	8769
BTEX (EPA SW-846 Method 8021B or 8260B)	107
Benzene (EPA SW-846 Method 8021B or 8260B)	0.3
<i>Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.</i>	
On what estimated date will the remediation commence	07/02/2025
On what date will (or did) the final sampling or liner inspection occur	07/11/2025
On what date will (or was) the remediation complete(d)	09/12/2025
What is the estimated surface area (in square feet) that will be reclaimed	1154
What is the estimated volume (in cubic yards) that will be reclaimed	86
What is the estimated surface area (in square feet) that will be remediated	1154
What is the estimated volume (in cubic yards) that will be remediated	86
<i>These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.</i>	
<i>The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.</i>	

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QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 510139
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QUESTIONS

Remediation Plan (continued)	
<i>Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.</i>	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
<i>(Select all answers below that apply.)</i>	
(Ex Situ) Excavation and off-site disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for off-site disposal	fJEG1635837366 OWL LANDFILL JAL
OR which OCD approved well (API) will be used for off-site disposal	Not answered.
OR is the off-site disposal site, to be used, out-of-state	Not answered.
OR is the off-site disposal site, to be used, an NMED facility	Not answered.
(Ex Situ) Excavation and on-site remediation (i.e. On-Site Land Farms)	Not answered.
(In Situ) Soil Vapor Extraction	Not answered.
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	Not answered.
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	Not answered.
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	Not answered.
Ground Water Abatement pursuant to 19.15.30 NMAC	Not answered.
OTHER (Non-listed remedial process)	Not answered.
<i>Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.</i>	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
I hereby agree and sign off to the above statement	Name: Robert Woodall Title: Environmental Analyst Email: robert.d.woodall@exxonmobil.com Date: 09/29/2025
<i>The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.</i>	

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Action 510139

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 510139
	Action Type: [C-141] Deferral Request C-141 (C-141-v-Deferral)

QUESTIONS

Deferral Requests Only	
<i>Only answer the questions in this group if seeking a deferral upon approval this submission. Each of the following items must be confirmed as part of any request for deferral of remediation.</i>	
Requesting a deferral of the remediation closure due date with the approval of this submission	Yes
Have the lateral and vertical extents of contamination been fully delineated	Yes
Is the remaining contamination in areas immediately under or around production equipment where remediation could cause a major facility deconstruction	Yes
Please list or describe the production equipment and how (re)moving the equipment would cause major facility deconstruction	Vertical and horizontal separators, production equipment, surface lines, lined containment containing transfer pumps would have to be deconstructed.
What is the remaining surface area (in square feet) that will still need to be remediated if a deferral is granted	1154
What is the remaining volume (in cubic yards) that will still need to be remediated if a deferral is granted	86
<i>Per Paragraph (2) of Subsection C of 19.15.29.12 NMAC if contamination is located in areas immediately under or around production equipment such as production tanks, wellheads and pipelines where remediation could cause a major facility deconstruction, the remediation, restoration and reclamation may be deferred with division written approval until the equipment is removed during other operations, or when the well or facility is plugged or abandoned, whichever comes first.</i>	
Enter the facility ID (f#) on which this deferral should be granted	fAPP2207552359 CORRAL CANYON 8 SAT
Enter the well API (30-) on which this deferral should be granted	Not answered.
Contamination does not cause an imminent risk to human health, the environment, or groundwater	True
<i>Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.</i>	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
I hereby agree and sign off to the above statement	Name: Robert Woodall Title: Environmental Analyst Email: robert.d.woodall@exxonmobil.com Date: 09/29/2025

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Action 510139

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 510139
	Action Type: [C-141] Deferral Request C-141 (C-141-v-Deferral)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	483126
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	07/17/2025
What was the (estimated) number of samples that were to be gathered	6
What was the sampling surface area in square feet	1200

Remediation Closure Request

Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.

Requesting a remediation closure approval with this submission	No
--	----

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CONDITIONS

Action 510139

CONDITIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 510139
	Action Type: [C-141] Deferral Request C-141 (C-141-v-Deferral)

CONDITIONS

Created By	Condition	Condition Date
scwells	Deferral approved. Deferral of BH01, BH01A and BH02 is approved until plugging and abandonment or a major facility deconstruction, whichever comes first. A complete and accurate remediation report and/or reclamation report will need to be submitted at that time.	10/7/2025