



October 13, 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: Closure Request
Avalon UT 643
Incident Number nAPP2501451404
API: 30-015-24388
Eddy County, New Mexico**

To Whom It May Concern:

Ensolum, LLC (Ensolum), on behalf of XTO Energy, Inc. (XTO), has prepared this *Closure Request* to document site assessment, excavation, and soil sampling activities performed at the Avalon UT 643 (Site). The purpose of the Site assessment, excavation, and soil sampling activities was to address impacts to soil following a release of produced water and crude oil. Based on field observations, field screening activities, and soil sample laboratory analytical results, XTO is submitting this *Closure Request*, describing remedial activities that have occurred and requesting no further remediation for Incident Number nAPP2501451404.

SITE DESCRIPTION AND RELEASE SUMMARY

The Site is located in Unit D, Section 32, Township 20 South, Range 28 East, in Eddy County, New Mexico (32.535575°, -104.207331°) and is associated with oil and gas exploration and production operations on State Trust Land managed by the New Mexico State Land Office (SLO) under lease number L003240003.

On January 13, 2025, equipment failure resulted in the release of approximately 10 barrels (bbls) of produced water and 1 bbl of crude oil into the pasture. A vacuum truck was immediately dispatched to the Site to recover free-standing fluids; 1 bbl of fluid was recovered. XTO reported the release to the New Mexico Oil Conservation Division (NMOCD) via Notification of Release (NOR) on January 14, 2025, and an Initial C-141 Application (C-141) on January 16, 2025. The release was assigned Incident Number nAPP2501451404.

SITE CHARACTERIZATION AND CLOSURE CRITERIA

The Site was characterized to determine 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). Results from the characterization desktop review are presented below.

Depth to groundwater at the Site is greater than 100 feet below ground surface (bgs) based on the nearest groundwater well data. On September 21, 1995, a New Mexico Office of the State Engineer (NMOSE) permitted well (CP-851), located 0.41 miles west of the Site, was measured and recorded a

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depth to groundwater of 115 feet bgs. The total depth of the well is 255 feet bgs. In addition, NMOSE permitted well CP-1714 POD 4, located 0.5 miles east of the Site, was drilled on August 4, 2019 to a total depth of 180 feet bgs. The depth to groundwater was recorded as 100 feet bgs. Multiple delineation soil borings occurred within 100 feet of the Site and were permitted by the NMOSE (CP-01849). These delineation soil borings were advanced to depths ranging from 30 feet to 36 feet bgs. No groundwater was encountered and the delineation soil borings were plugged and abandoned per NMOSE regulations. All Well Record & Logs mentioned are provided in Appendix A.

The closest continuously flowing or significant watercourse to the Site is a seasonal dry wash located 2,518 feet to the northwest. 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 potentially underlain by unstable geology. Per the New Mexico Oil and Gas Map, the Site is within high potential karst designation area. Southwest Geophysical Consulting, a Bureau of Land Management (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, confirming the absence of karst below the Site. A copy of the karst survey is included in Appendix B. Potential Site receptors are identified on Figure 1.

Based on the results of the Site Characterization and karst survey, 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)-gasoline range organics (GRO) and TPH-diesel range organics (DRO): 1,000 mg/kg
- TPH: 2,500 mg/kg
- Chloride: 20,000 mg/kg

A reclamation requirement of 600 mg/kg chloride and 100 mg/kg TPH was applied to the top 4 feet of the release, per 19.15.29.13.D (1) NMAC for the top 4 feet of areas that will be reclaimed following remediation.

SLO CULTURAL RESOURCES AND BIOLOGICAL REVIEW

Cultural Properties Protection

The release was identified in the pasture, as a result, the release location was assessed for determination of whether the release encroached into undisturbed areas to comply with the Cultural Properties Protection Rule (CPP) prior to disturbing the surface with mechanical equipment. An Archaeological Records Management System (ARMS) review was performed for the release extent prior to excavation. No cultural resources were identified within and/or around the release extent requiring remediation efforts. An approved NMSLO Cultural Resources Cover Sheet is attached in Appendix C.

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Biological Review

Ensolum personnel conducted a desktop review to establish if the Site is within an area of possible threatened, endangered, and sensitive wildlife and plant species, environmentally sensitive areas, surface waters, and sensitive soils.

- A review of the U.S. Fish and Wildlife Services Information for Planning and Consultation (IPaC) resources indicated there are no critical habitats at the Site. Potential habitats for Texas Hornshell Clam, Pecos Bluntnose Shiner, and Piping Plover were identified as potentially being present in nearby areas, but none were observed at the Site. A review of the BLM NM Plant Wildlife Habitat maps indicated that there are potential Scheer's beehive cactus located near the Site, but none were observed at the Site.
- The Site is not located within an area of possible range of the Lesser Prairie Chicken habitat based on a review of SLO Candidate Conservation Agreement with Assurances (CCAA) map.
- No environmentally sensitive receptors were located near the Site, as determined by the Site Characterization.
- The Natural Resources Conservation Service (NRCS) Web Soil Survey classifies the soil type at the Site as Tonuco loamy sand. The Tonuco loamy sand is not considered a sensitive soil per the SLO guidelines.

SITE ASSESSMENT AND DELINEATION SOIL SAMPLING ACTIVITIES

On January 21, 2025 Ensolum personnel visited the Site to evaluate the release extent based on information provided on the C-141 and visual observations. Seven delineation soil samples (SS01 through SS07) were collected within the release extent from a depth of approximately 0.5 feet bgs. The soil samples were field screened for volatile organic compounds (VOCs) utilizing a calibrated photoionization detector (PID) and chloride using Hach® chloride QuanTab® test strips. The release extent and delineation soil sample locations were mapped utilizing a handheld Global Positioning System (GPS) unit and are depicted on Figure 2. Photographic documentation is included in Appendix D.

On February 26, 2025, Ensolum personnel returned to the Site to complete delineation activities. Three delineation potholes were advanced in the vicinity of SS01 through SS03. Delineation potholes PH01 and PH03 were advanced via heavy equipment to a maximum depth of 1-foot bgs in the vicinity of SS03 and SS01, respectively. Delineation pothole PH02 was advanced to maximum depth of 9 feet bgs in the vicinity of SS02. Discrete delineation soil samples were collected from each pothole at depths ranging from 1-foot to 9 feet bgs. Soil from the delineation potholes was field screened for VOCs and chloride. Field screening results and observations for the potholes were logged on lithologic soil sampling logs, which are included in Appendix E. The delineation soil sample locations are depicted on Figure 2.

The 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 contaminants of concern (COCs): BTEX following United States Environmental Protection Agency (EPA) Method 8021B; TPH- GRO, TPH- DRO, and TPH-oil range organics (ORO) following EPA Method 8015M/D; and chloride following Standard Method SM4500.

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Laboratory analytical results for delineation soil samples SS01/PH03, SS02/PH02, and SS03/PH01 indicated chloride and/or TPH concentrations exceeded the Closure Criteria or reclamation requirements. Based on the presence of chloride and TPH impacted soil, excavation activities were warranted.

EXCAVATION AND CONFIRMATION SOIL SAMPLING ACTIVITIES

Between February 28 and September 10, 2025, Ensolum personnel were at the Site to oversee excavation activities and conduct confirmation soil sampling. Excavation activities were performed using heavy equipment. To direct excavation activities, Ensolum personnel screened soil for VOCs and chloride as described above. Following the removal of impacted soil, Ensolum personnel collected 5-point composite soil samples representing no more than 200 square feet from the sidewalls and floor of the excavation. Confirmation soil samples FS01 through FS16 were collected from the floor of the excavation at depths ranging from 4 feet to 10 feet bgs. Confirmation sidewall soil samples SW01 through SW13 were collected from the sidewalls of the excavation at depths ranging from ground surface to 8 feet bgs. Sidewall soil sample SW05 was fully excavated and replaced with sidewall soil samples SW11 and SW12, all other samples requiring additional excavation maintained correlating nomenclature. On the northern portion of the excavation extent, the edge of a previous remediation liner was observed. Soil was excavated above the liner to remove impacts, but the liner was not disturbed or impacted during remediation activities. Following sampling of accessible soils, the liner was immediately backfilled to prevent damage. The excavation extent and confirmation soil sample locations are presented on Figure 3. The confirmation soil samples were collected, transported, and analyzed for the same COCs as described above at Cardinal in Hobbs, New Mexico.

The final excavation extent measured approximately 2,800 square feet. A total of approximately 800 cubic yards of impacted soil was removed during the excavation activities. The impacted soil was transported and properly disposed of at the R360 Halfway Disposal in Hobbs, New Mexico. The final excavation extent was backfilled with material purchased locally and recontoured to match pre-existing Site conditions. One representative 5-point composite sample (BF01) was collected from the topsoil backfill material on September 24, 2025. The backfill soil sample was transported under strict chain-of-custody procedures to Cardinal.

LABORATORY ANALYTICAL RESULTS

Laboratory analytical results for all final confirmation soil samples collected from the final excavation extent indicated that all COC concentrations were compliant with the Closure Criteria or reclamation requirements were applicable. All delineation soil sample results that indicated COC concentrations exceeded Closure Criteria were removed by excavation activities. Laboratory analytical results for backfill soil sample BF01 confirmed compliance with reclamation requirements. Laboratory analytical results are summarized in Table 1 and the complete laboratory analytical reports are included as Appendix F.

RECLAMATION PLAN

The Site will be seeded with SLO loamy seed mix for loamy sites at the rate specified in pounds of pure live seed (PLS) per acre during the next SLO recommended seeding season.

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Species/Cultivar	PLS/Acre
Black grama (VNS, Southern)	1.0
Blue grama (Lovington)	1.0
Sideoats grama (Vaughn, El Reno)	4.0
Sand dropseed (VNS, Southern)	2.0
Alkali sacaton (VNS, Southern)	1.0
Little bluestem (Cimarron, Pastura)	1.5

The seed mix will be applied via drill seeding or broadcast seeding. If broadcast seeding is selected, the PLS/acre will be doubled and the seed will be raked in by chaining or dragging the Site. Reclamation activities will be documented via on-site monitoring and photographs will be included in a *Re-Vegetation Report*.

CLOSURE REQUEST

Site assessment, delineation, and excavation activities were conducted at the Site to address the January 13, 2025, produced water and crude oil release. Laboratory analytical results for all confirmation soil samples collected from the final excavation extent indicated that all COC concentrations were compliant with the Closure Criteria or reclamation requirement, where applicable. Based on the soil sample analytical results, no further remediation was required. The excavation was backfilled with material purchased locally and recontoured to match pre-existing Site conditions.

A *Re-vegetation Report* will be submitted to the NMOCD once vegetation growth in the reclaimed pasture area has uniform vegetative cover that reflects a life-form ratio of plus or minus 50 percent (%) of pre-disturbance levels and a total percent plant cover of at least 70% of pre-disturbance levels, excluding noxious weeds, per NMAC 19.15.29.13 D.(3).

Excavation of soil has mitigated impacts at this Site. XTO believes these remedial actions are protective of human health, the environment, and groundwater. As such, XTO respectfully requests closure for Incident Number nAPP2501451404.

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

Sincerely,
Ensolum, LLC

A handwritten signature in black ink, appearing to read "Tracy Hillard".

Tracy Hillard
Project Engineer

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

Tacoma Morrissey
Associate Principal

XTO Energy, Inc
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cc: Robert Woodall, XTO
Richard Kotzur, XTO
SLO

Appendices:

Figure 1	Site Receptor Map
Figure 2	Delineation Soil Sample Locations
Figure 3	Confirmation Soil Sample Locations
Table 1	Soil Sample Analytical Results
Appendix A	Referenced Well Records
Appendix B	Environmental Karst Survey Report
Appendix C	Land Access References
Appendix D	Photographic Log
Appendix E	Lithologic Soil Sampling Logs
Appendix F	Laboratory Analytical Reports & Chain-of-Custody Documentation
Appendix G	Spill Calculation

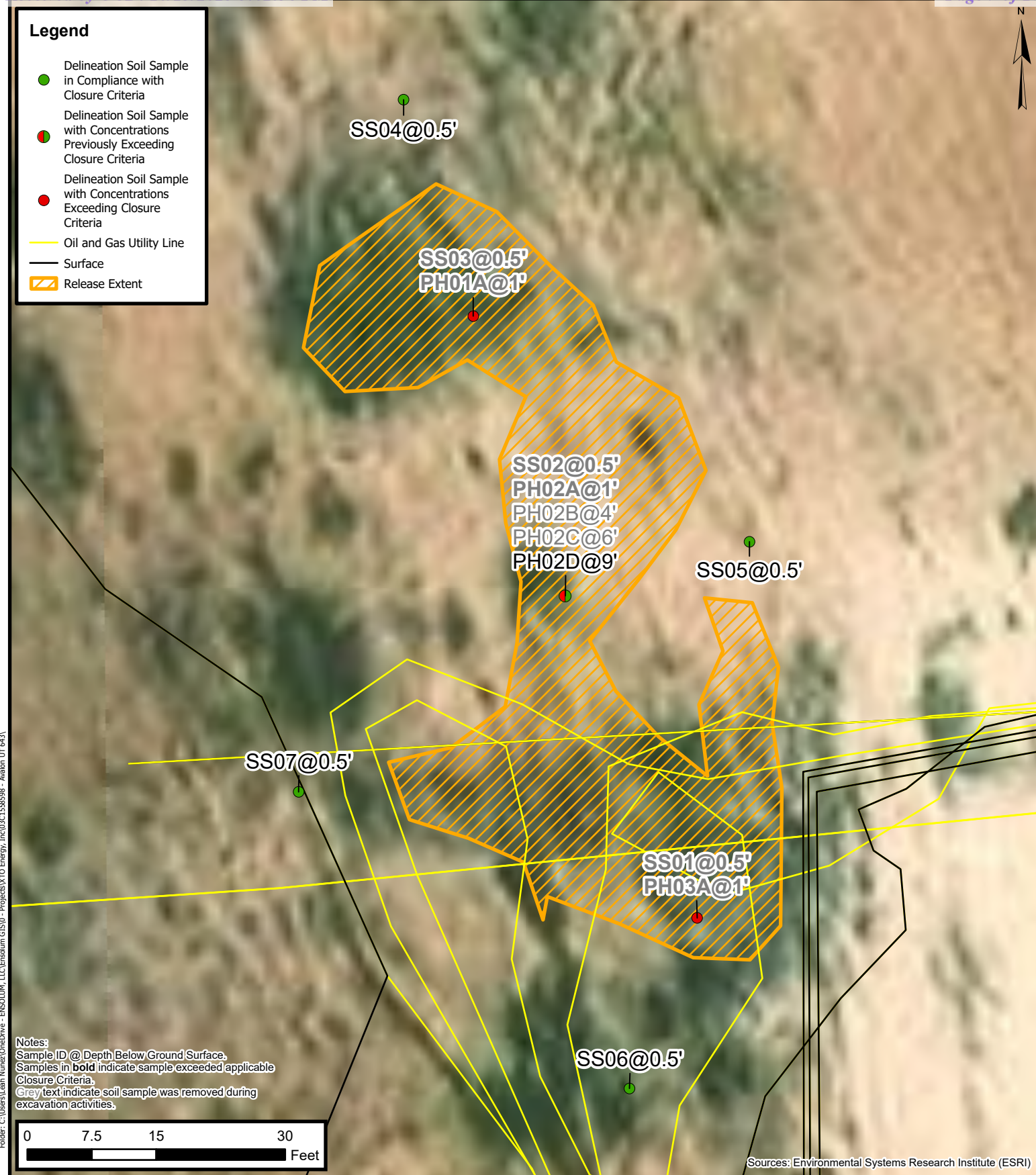


FIGURES

XTO Energy, Inc
Avalon UT 643
Incident Number: nAPP2501451404
Unit D, Section 32, T 20S, R 28E
Eddy County, New Mexico

1





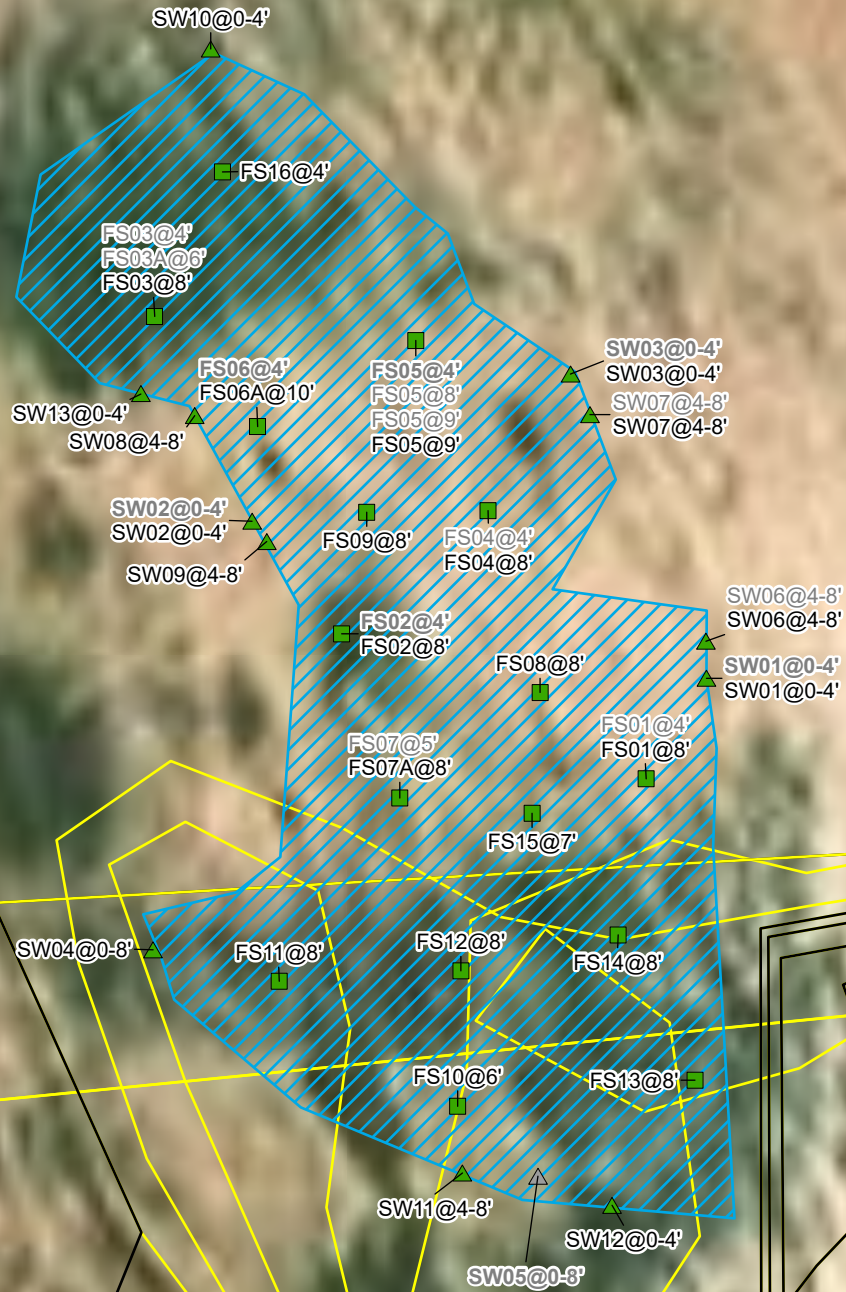
Delineation Soil Sample Locations

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 Unit D, Section 32, T 20S, R 28E
 Eddy County, New Mexico

FIGURE
2

Legend

- Confirmation Floor Soil Sample in Compliance with Closure Criteria
- ▲ Confirmation Sidewall Soil Sample in Compliance with Closure Criteria
- ▲ Excavated Confirmation Sidewall Soil Sample
- Oil and Gas Utility Line
- Surface
- ▨ Excavation Extent



Notes:
 Sample ID @ Depth Below Ground Surface.
 Samples in **bold** indicate sample exceeded applicable Closure Criteria.
 Grey text indicate soil sample was removed during excavation activities.

0 7.5 15 30
 Feet

Sources: Environmental Systems Research Institute (ESRI)

Confirmation Soil Sample Location

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 Unit D, Section 32, T 20S, R 28E
 Eddy County, New Mexico

FIGURE

3





TABLES



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
Avalon UT 643
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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	1,000	2,500	20,000
Delineation Soil Samples										
SS01	01/24/2025	0.5	<0.050	<0.300	<10.0	1,160	337	1,160	1,497	1,960
PH03A	02/26/2025	1	9.04	156	5,020	10,700	1,820	15,720	17,540	5,120
SS02	01/24/2025	0.5	<1.00	47.7	739	2,130	273	2,869	2,403	1,380
PH02A	02/26/2025	1	<0.050	3.97	182	1,850	500	2,032	2,532	1,360
PH02B	02/26/2025	4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	80.0
PH02C	02/26/2025	6	<0.050	<0.300	<10.0	33.6	<10.0	33.6	33.6	352
PH02D	02/26/2025	9	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	416
SS03	01/24/2025	0.5	<1.00	30.5	576	2,240	<100	2,786	2,766	8,200
PH01A	02/26/2025	1	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	2,000
SS04	01/21/2025	0.5	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32.0
SS05	01/21/2025	0.5	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	416
SS06	01/21/2025	0.5	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	16.0
SS07	01/21/2025	0.5	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32.0
Confirmation Soil Samples										
FS01	02/28/2025	4	<0.050	<0.300	<10.0	19.9	<10.0	19.9	19.9	1,570
FS01	04/01/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	528
FS02	02/28/2025	4	<0.050	<0.300	<50.0	5,100	1,460	5,100	6,560	240
FS02	03/31/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	752
FS03	02/28/2025	4	<0.050	<0.300	<10.0	268	113	268	381	64.0
FS03A	03/24/2025	6	<0.050	<0.300	<10.0	341	93.3	341	434	432
FS03	03/31/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	272
FS04	02/28/2025	4	<0.050	<0.300	<10.0	763	239	763	1,002	496
FS04	04/01/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	288
FS05	02/28/2025	4	<0.050	<0.300	<10.0	3,080	816	3,080	3,896	784
FS05	03/31/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,010
FS05	04/04/2025	9	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,020
FS05	04/11/2025	9	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	384
FS06	02/28/2025	4	<0.050	4.20	89.7	1,350	363	1,440	1,803	912
FS06A	03/21/2025	10	<0.050	<0.300	<10.0	43.2	15.1	43.2	58.3	416



TABLE 1
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Avalon UT 643
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	1,000	2,500	20,000
FS07	03/13/2025	5	<0.050	<0.300	<10.0	596	46.1	596	642	368
FS07A	03/21/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	480
FS08	03/31/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	608
FS09	03/31/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	720
FS10	04/01/2025	6	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	64.0
FS11	04/04/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	624
FS12	04/11/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	112
FS13	04/11/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	128
FS14	04/11/2025	8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	96.0
FS15	04/11/2025	7	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	176
FS16	09/10/2025	4	<0.050	<0.300	<10.0	192	155	195	350	752
SW01	02/28/2025	0-4	<0.050	<0.300	<10.0	13.8	11.1	13.8	24.9	720
SW01	09/10/2025	0-4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	368
SW02	02/28/2025	0-4	<0.050	1.92	135	3,440	611	3,575	4,186	1,340
SW02	04/02/2025	0-4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	64.0
SW03	02/28/2025	0-4	<0.050	<0.300	<10.0	70.4	21.6	70.4	92.0	640
SW03	09/10/2025	0-4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	320
SW04	03/21/2025	0-8	<0.050	<0.300	<10.0	25.0	10.3	25.0	35.3	192
SW05	03/21/2025	0-8	<0.050	<0.300	<10.0	205	53.2	205	258	432
SW06	04/01/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,550
SW06	04/11/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	144
SW07	04/04/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	944
SW07	04/11/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	400
SW08	04/01/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	240
SW09	04/01/2025	4-8	<0.050	<0.300	<10.0	29.3	<10.0	29.3	29.3	400
SW10	04/01/2025	0-4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	96.0
SW11	04/04/2025	4-8	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	240
SW12	04/11/2025	0-4	<0.050	<0.300	<10.0	77.0	11.0	77.0	88.0	144
SW13	09/10/2025	0-4	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	208



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
Avalon UT 643
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	1,000	2,500	20,000
Backfill Soil Sample										
BF01	09/24/2025	0.2	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	80.0

Notes:

bgs: below ground surface
mg/kg: milligrams per kilogram

GRO: Gasoline Range Organics
DRO: Diesel Range Organics

NMOCD: New Mexico Oil Conservation Division

ORO: Oil Range Organics

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes

TPH: Total Petroleum Hydrocarbon

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

NMAC: New Mexico Administrative Code

Grey text indicates soil sample removed during excavation activities



APPENDIX A

Referenced Well Records

STATE ENGINEER OFFICE
WELL RECORD

Revised June 1972

476231

Section 1. GENERAL INFORMATION

(A) Owner of well Exxon Company USA Owner's Well No. _____
Street or Post Office Address P.O. Box 1600
City and State Midland, Texas 79702-1600

Well was drilled under Permit No. CP-850 CP-851 and is located in the:
a. $\frac{SE}{NW}$ $\frac{NW}{NW}$ $\frac{NE}{SW}$ $\frac{31}{32}$ of Section 20-S. Township 28-E. Range 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 421
Address P.O. Box 692 Tatum, New Mexico 88267
Drilling Began 9/14/95 Completed 9/14/95 Type tools rotary Size of hole 7 7/8 in.
Elevation of land surface or _____ at well is _____ ft. Total depth of well 255 ft.
Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 115 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			
205	230	25	lime	12

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
6 5/8	.188		1	257	257	orange peel	181	257

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 _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 09-21-95 Quad _____ FWL _____ FSL _____
File No. CP-851 Use OWD Location No. 20.28.31.21411

Section 6. LOG OF HOLE.

[illegible]

Section 7. REMARKS AND ADDITIONAL INFORMATION

RECEIVED
GENERAL OFFICE
ROSNELL NEW MEXICO
35 SEP 21 AM 10 34

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.

Corby H. C. Miller
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.) CP-1714 POD4		WELL TAG ID NO.		OSE FILE NO(S).		
	WELL OWNER NAME(S) Dave Andersen				PHONE (OPTIONAL)		
	WELL OWNER MAILING ADDRESS 616 Queens Hwy				CITY Carlsbad	STATE NM	
					ZIP 88220		
	WELL LOCATION (FROM GPS)	LATITUDE 32.53620		DEGREES 32	MINUTES 53	SECONDS 620	N
	LONGITUDE -104.19707					W	
* ACCURACY REQUIRED: ONE TENTH OF A SECOND							
* DATUM REQUIRED: WGS 84							
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE							
2. DRILLING & CASING INFORMATION	LICENSE NO. WD1778		NAME OF LICENSED DRILLER Travis Mann		NAME OF WELL DRILLING COMPANY Third Generation Drilling		
	DRILLING STARTED 08-04-19	DRILLING ENDED 08-04-19	DEPTH OF COMPLETED WELL (FT) 140	BORE HOLE DEPTH (FT) 180	DEPTH WATER FIRST ENCOUNTERED (FT) 100		
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input type="checkbox"/> DRY HOLE <input checked="" type="checkbox"/> SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT) 41		
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:						
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:						
	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)
	FROM	TO					
	0	80	9 7/8	PVC SDR17	slip	5	0.25
	80	140	9 7/8	PVC SDR17	slip	5	0.25
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					
	0	20	9 7/8	Cement	7.88	Poured	
	20	140	9 7/8	Pea gravel	47.322	Poured	

FOR OSE INTERNAL USE

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

FILE NO. CP-1714	POD NO. 4	TRN NO. 627376
LOCATION 205.28E.32.211	WELL TAG ID NO. —	PAGE 1 OF 2

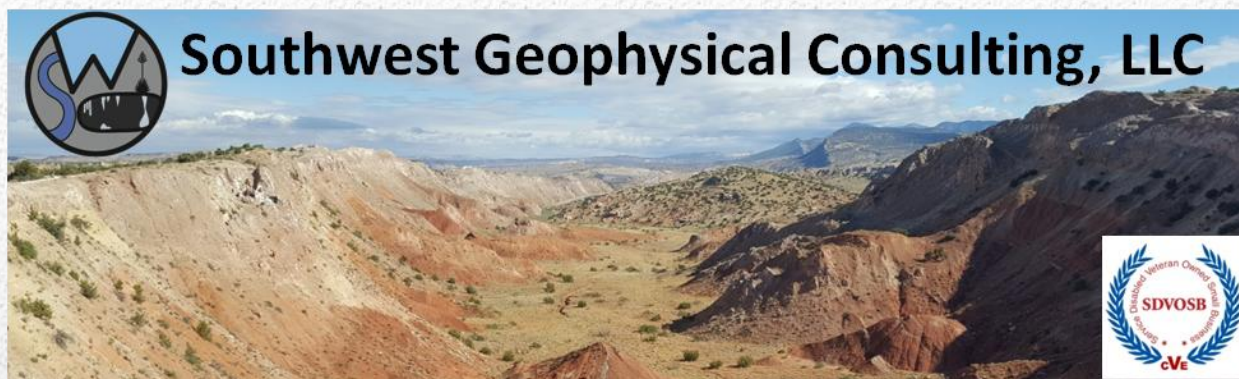
1. HYDROGEOLOGIC LOG OF WELL

FOR USE INTERNAL USE



Appendix B

Environmental Karst Survey Report



Environmental Karst Study Report XTO Avalon UT 643 Eddy County, New Mexico

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

Within 200 feet of the spill delineation boundary:

- ☒ Negative ☐ Positive for surface karst
- ☒ Stable ☐ Unstable Ground
- ☐ Karst Monitor Recommended

August 11, 2025

ENS-015-20250619

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MMXXV

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1.0 INTRODUCTION

This report was commissioned by Ensolum, LLC (hereinafter referred to as "the client"), on June 19, 2025, for the purpose of conducting an environmental karst study within an area encompassing the XTO Avalon UT 643 release site (hereinafter termed "AVLN") centered at N 32.535507° W 104.207343°

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 200 feet of the spill delineation boundary of the XTO Avalon UT 643 release as provided by the client via e-mail (03C1558598 - Avalon UT 643.kmz) on June 19, 2025, using electrical resistivity imaging^[3].

1.2 Summary of Findings

- **No surface karst features exist within 200 feet (61 meters) of the spill delineation boundary.**
- **No anomalies consistent with subsurface air- or water-filled voids were found within the AVLN geophysical survey area, indicating the zone beneath the geophysical survey is not subject to collapse.**
- **Well-layered stratigraphy is interpreted to exist beneath the area where the geophysical survey was conducted, indicating stable ground within the 200-foot survey boundary.**

1.3 Affected Environment

The AVLN 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 **HIGH** karst occurrence zone (HKOZ)^[5] (**Figure 1**).

A high karst occurrence zone is defined as an area in known soluble rock types that contains a high frequency of significant caves and karst features such as sinkholes, bedrock fractures that provide rapid recharge of karst aquifers, and springs that provide riparian habitat ^[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.

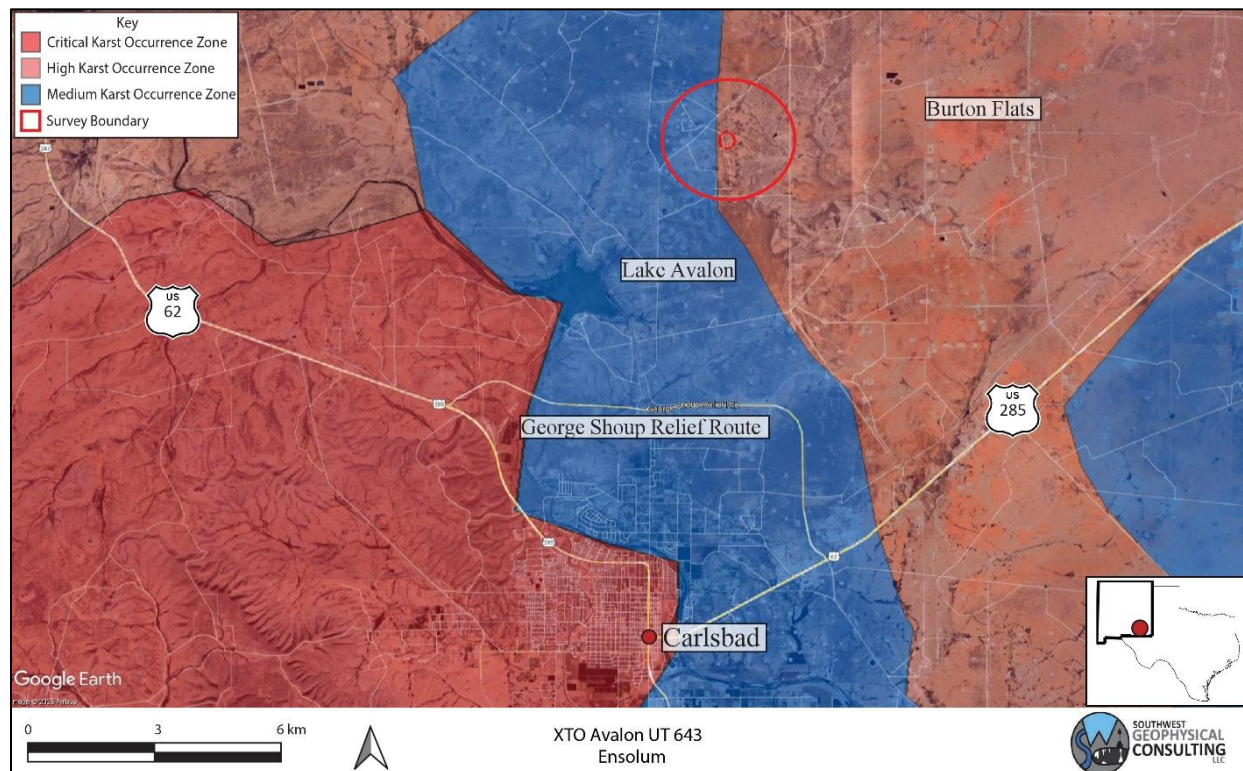


Figure 1: Karst occurrence zone overview. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

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 should be conducted in the field 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 13.2 kilometers (8.2 miles) north of Carlsbad, New Mexico, between Illinois camp and Angel Ranch Roads. The release area is located within the NW $\frac{1}{4}$ section of section 32, NM T20S R28E^[6] (**Figure 1** and **Figure 2**). The region has rolling 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 HKOZ^[5] (**Figure 1**) and within NMSLO managed land^[10] (**Figure 2**).

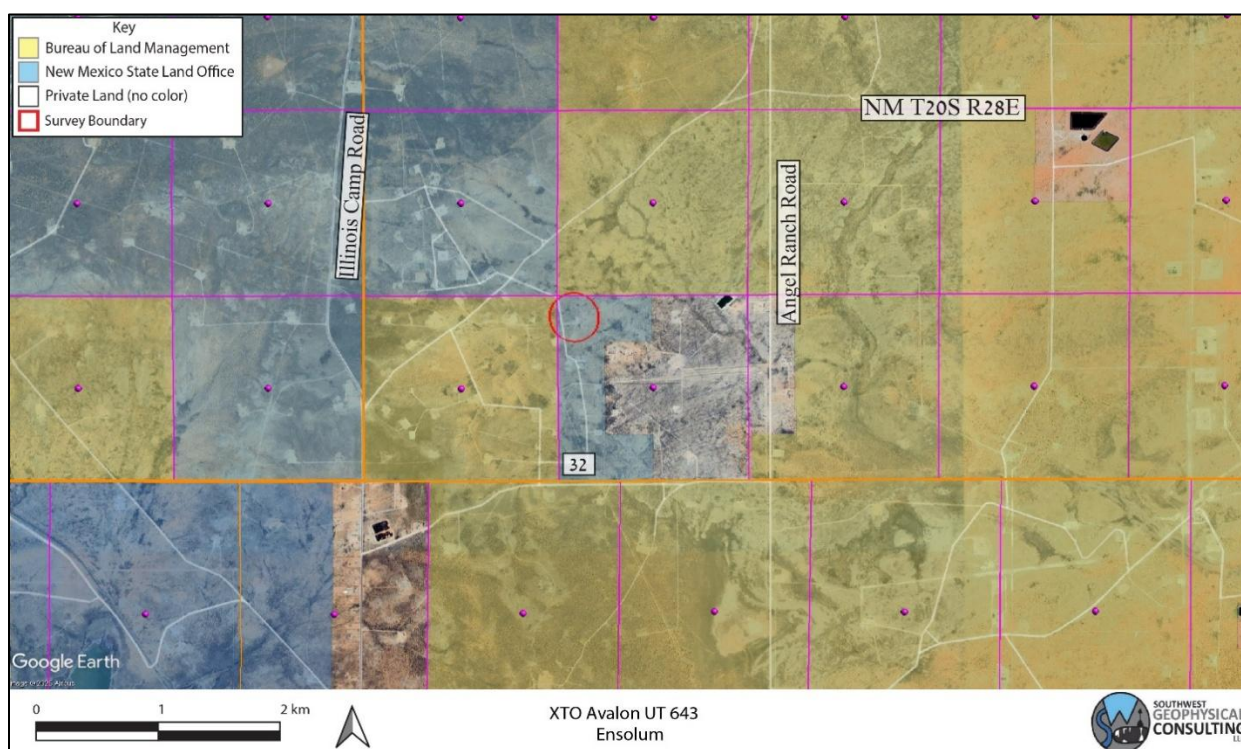


Figure 2: Land ownership and PLSS overview. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

2.2 Local Geology Summary

The site for the AVLN survey is located at an elevation of 987 meters (3,238 feet), \pm 2 meters (6.6 feet). This region is entirely underlain by the Permian Rustler Formation (Pru – not shown as it does not outcrop at the surface in this area). The area is mantled by thin gypsiferous soils (gypsite), Quaternary alluvium (Qal), eolian (Qe), and piedmont deposits (Qal)^[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), 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].

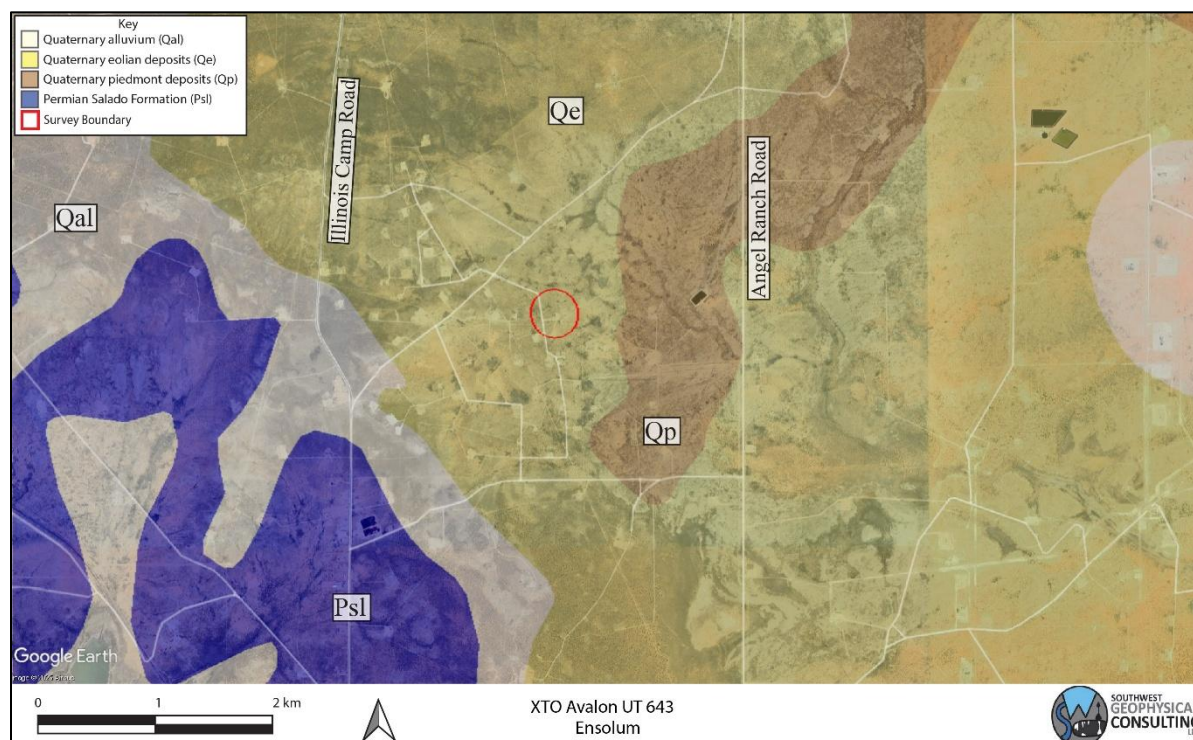


Figure 3: Geology overview. Geology map credit: The Digital Geologic Map of New Mexico in ARC/INFO Format. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

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 July 5, 2025^[15]; the Angel Draw, 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 results within the survey boundary.

Surface karst surveys are conducted by sUAS at low elevation within 200 meters of the spill delineation boundary^[4] (**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].

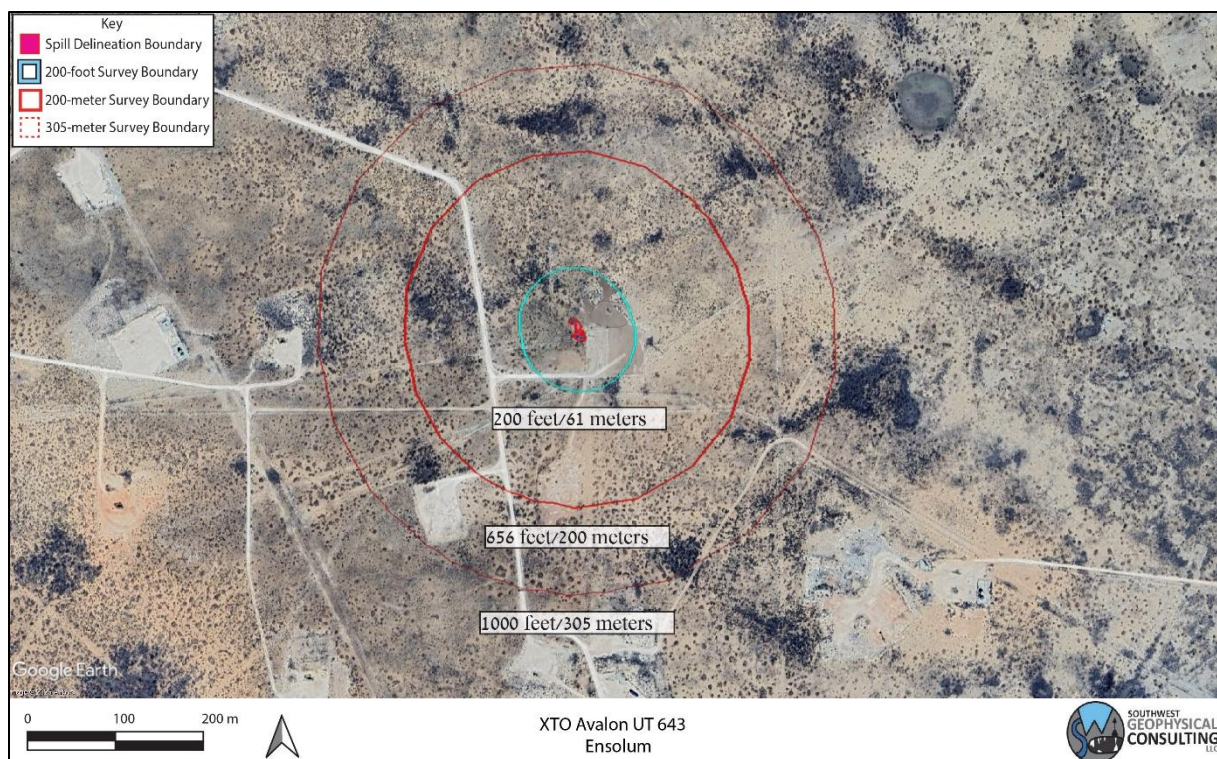


Figure 4: Surface survey overview. Background image credit: Google Earth. Image date: March 20, 2023. Datum: WGS-84.

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 Britt Bommer of Southwest Geophysical Consulting on July 21, 2025.

2.3.2 Geophysical Survey

For this survey, a Guideline Geo Terrameter LS 2 and a 28-electrode array of 40-centimeter-long electrodes were used to image the subsurface. This survey consisted of two resistivity lines in a dipole-dipole configuration; line AVLN01 is laid out north to south while line AVLN02 is laid out northwest to southeast. Both lines consisted of 28 electrodes at 5-meter spacing, resulting in 135-meter-long arrays (**Figure 5, Table 1**). A preconfigured protocol file was used to run the data collection (DipoleDipole2x14). This electrode configuration provided a depth of investigation of 27 meters (89 feet) and a resolution of 2.5 to 3.0 meters (8.2 to 9.8 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.

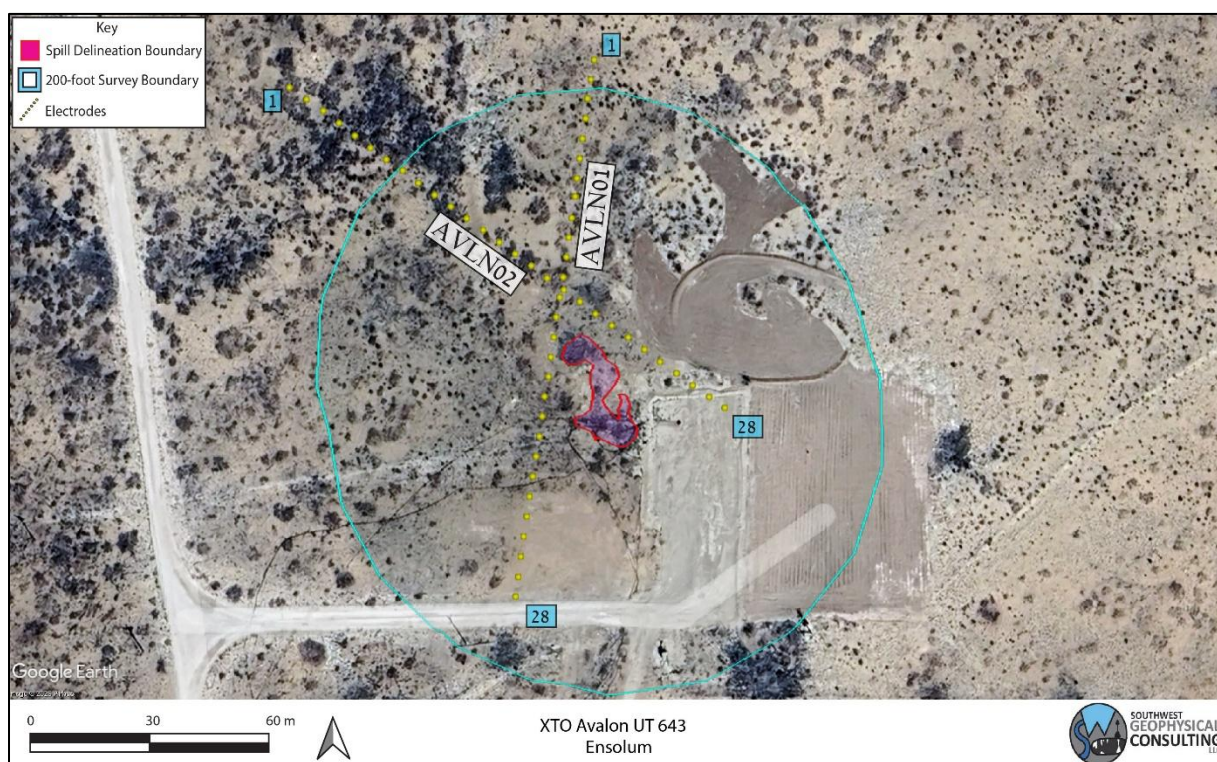


Figure 5: Geophysical survey overview. Two survey lines were conducted with 28 electrodes each at 5-meter spacing (yellow dots denoted with blue numbers). Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

Table 1 provides basic line data. Detailed information 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 .kmz file contains all the points for the survey line listed in the file name. These data are available in the accompanying files AVLN_ERI_Points.xlsx and ENS-015-20250619_AVLN_Data_Files.kmz.

File Name:	Completed By:	Date:
AVLN01.kmz	Garrett Jorgensen Olague – Senior Field Geologist Britt Bommer – Field Geologist Steven Kesler – Field Geologist Aaron Beirl – Field Geologist	7/28/2025
AVLN01.kmz		

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

All field work, including setup, stow, and travel, was completed by Garrett Jorgensen Olague, Britt Bommer, Steven Kesler, and Aaron Beirl on July 28, 2025.

3.0 RESULTS

3.1 Surface Karst Survey

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

No springs exist within the 305-meter (1,000-foot)^[1] survey boundary (Figure 6).

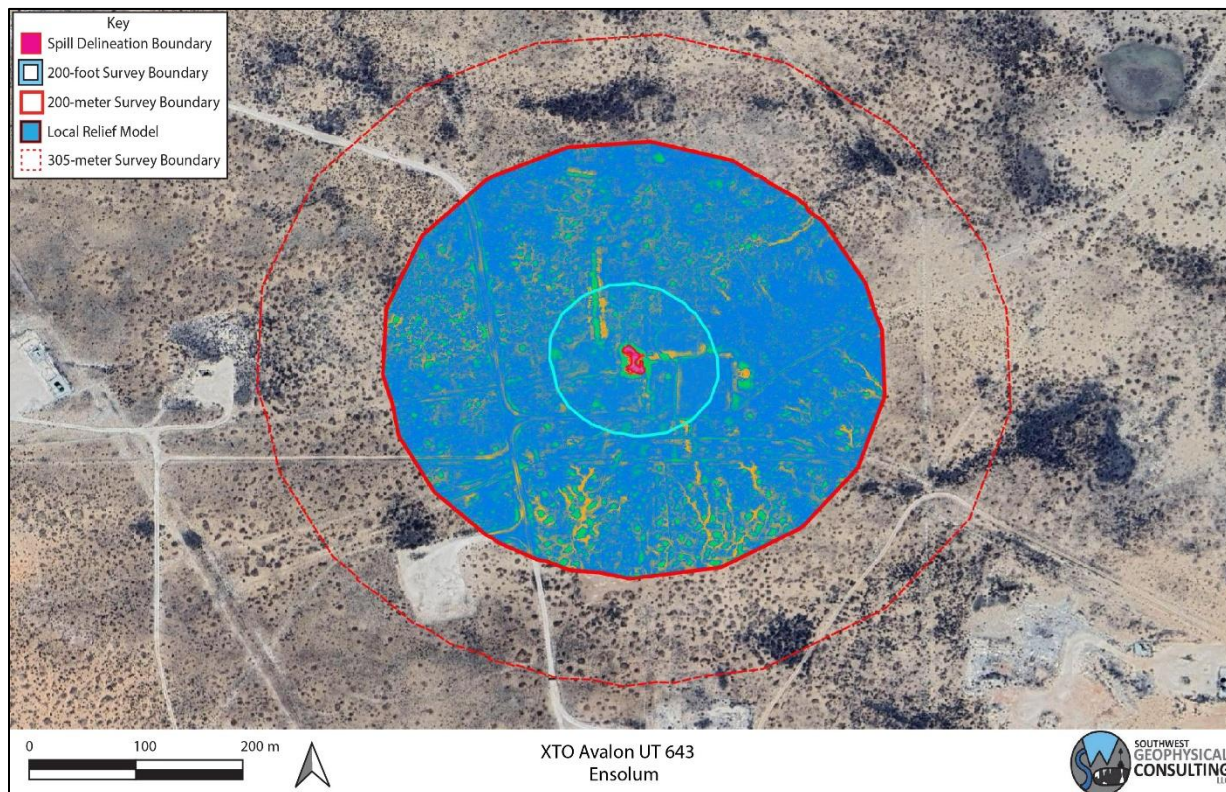


Figure 6: Surface karst survey results. Background image credit: Google Earth. Image date: March 20, 2023. Image datum: WGS-84.

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 well-layered geologic system with resistivities between 2.9 and 2,573 Ohm-m (**Figure 7**). 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.

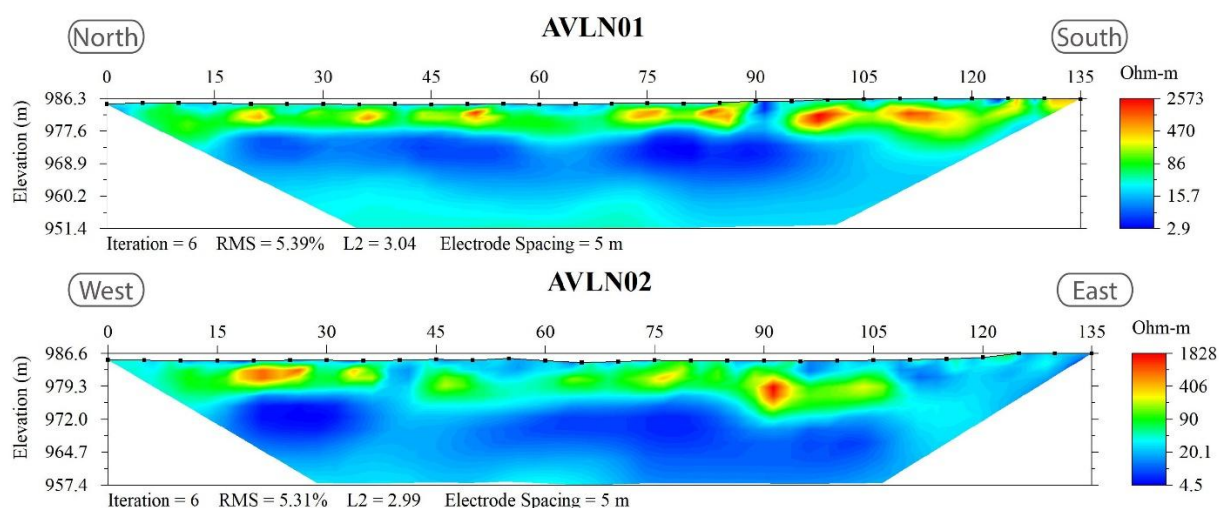


Figure 7: 2D inverted resistivity section. Reds and oranges indicate higher resistivity values. Yellows and greens are medium-resistivity values. Blues are low-resistivity values. Please note that the color scale is relative.

4.0 DISCUSSION

No surface karst features and no anomalies consistent with air-filled subsurface voids are found within the AVLN survey area. However, small solutionally enlarged voids or fractures at or near the resolution limit of the survey (2.5 – 3.0 meters) may be present. Areas of higher resistivity (reds, yellows, and greens) near the surface are interpreted as dry gypsite soils and gypsum or dolomite bedrock of the Rustler Formation^[17] (**Figure 7** and **Figure 8**). Very low-resistivity areas between 2.9 – 10 Ohm-m may either represent fluid from the brine release, surface-to-subsurface hydrologic pathways, or a layer of either clays and halite lenses or moist or saturated layers within the Rustler Formation (**Figure 7**).

Please remember that these are interpretations made from knowledge of the local subsurface materials and experience. **They remain interpretations until verified by geotechnical methods.** Employing a BLM-CFO approved karst monitor on site during any drilling and/or remediation activities that require excavation below four feet in depth 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.

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 (2.5– 3.0 meters) may exist; these may be encountered during excavation, and if so, should be evaluated by a karst specialist prior to continued work.

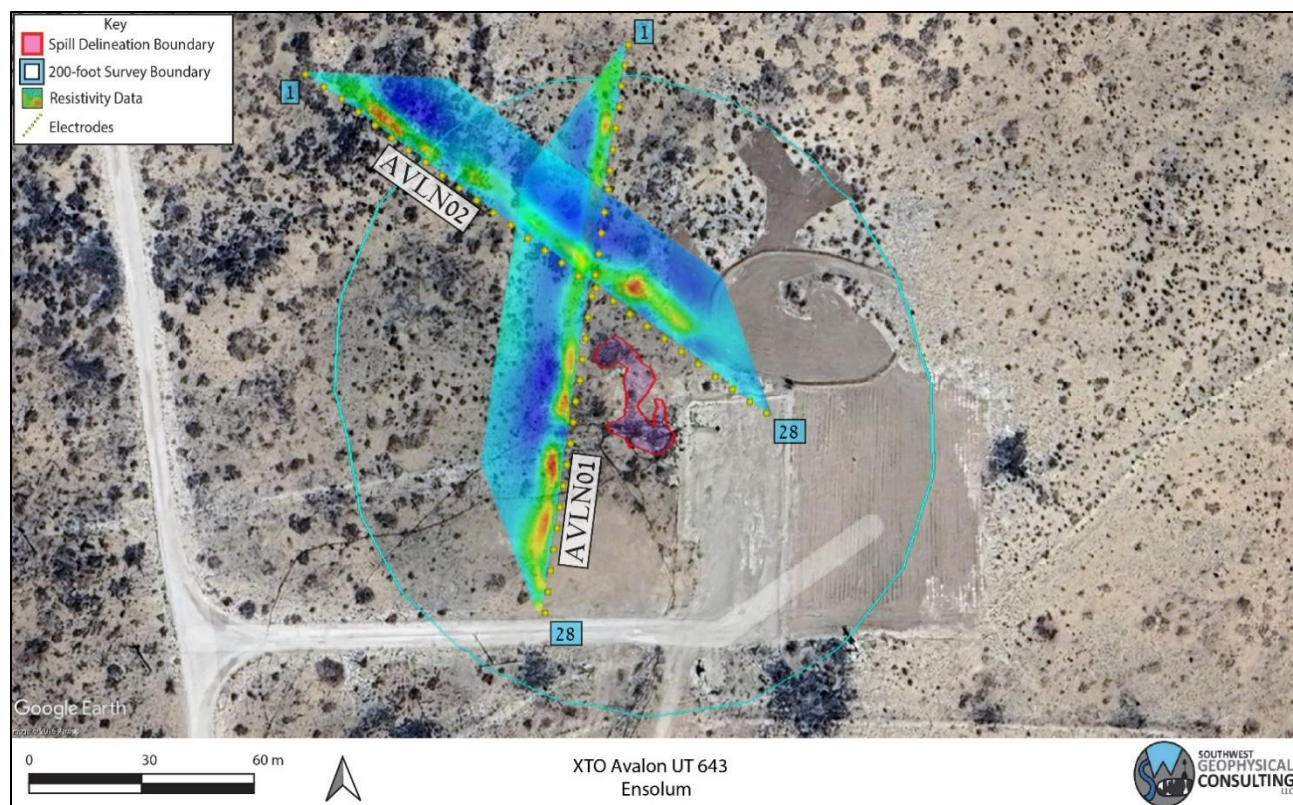


Figure 8: Data overlay. Colored trapezoid is the 2D inverted resistivity lines. Background image credit: Google Earth. Image date: March 20, 2023.

5.0 SUMMARY

- **The AVLN survey contains no surface karst features within 200 feet (61 meters) of the spill delineation boundary.**
- **No shallow anomalies interpreted as large voids or related karst features that would present a danger to equipment operators are located within the geophysical survey area.**
- Intercepting a void during remediation is unlikely, but still possible. Small voids or solutionally enlarged fractures below the resolution limit of the survey may be encountered.
- **Well-layered stratigraphy is interpreted to exist beneath the geophysical survey line indicating stable ground in the area of the subsurface investigation.**
- When conducting any remediation activities in this area, employing a BLM-CFO approved karst monitor on 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 (along with the associated data files) commissioned at the request of the land manager should be submitted to 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).
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- 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).
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- 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).
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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
Pdl	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-015-20250619 entitled, “Environmental Karst Study Report, XTO Avalon UT 643, 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 27, 2025.



David D. Decker
PhD, CPG-12123





Appendix C

Land Access References



Stephanie Garcia Richard
COMMISSIONER

State of New Mexico
Commissioner of Public Lands

310 OLD SANTA FE TRAIL
P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

COMMISSIONER'S OFFICE

Phone (505) 827-5760

Fax (505) 827-5766

www.nmstatelands.org

MEMORANDUM

TO: Ensolum

FROM: Megan Weldy, *Archaeologist/Conservationist*
(505) 827-5742
mweldy@nmslo.gov

SUBJECT: Ensolum on behalf of XTO
Remediation for: XTO's Avalon UT 643
Section 32, T20S, R28E, N.M.P.M. Eddy County

REFERENCE: NMSLO Cultural Properties Protection Rule (19.2.24 NMAC)

DATE: 2/25/2025

Thank you for your submission relating to the Proponent's proposed remediation activities at XTO's Avalon UT 643 Remediation Site. An archaeological survey of the entire area of potential effect has been completed and no cultural properties were identified. Pursuant to NMSLO 19.2.24.8 (C) NMAC, remediation may proceed.

If any cultural materials are inadvertently encountered during surface disturbance, work must cease within 50 feet and the NMSLO Cultural Resources Office must be notified immediately by emailing (CROinfo@nmslo.gov). Please reach out if you have questions or need additional clarification.



Stephanie Garcia Richard, Commissioner of Public Lands
State of New Mexico

NMSLO Cultural Resources Cover Sheet Exhibit

NMCRIS Activity Number:

(if applicable)

Exhibit Type (select one)

ARMS Inspection/Review - Summarize the results (select one):

- (A) The entire area of potential effect or project area has been previously surveyed to current standards and **no cultural properties** were found within the survey area.
- (B) The entire area of potential effect or project area has been previously surveyed to current standards and **cultural properties were found** within the survey area.
- (C) The entire area of potential effect or project area has **not** been previously surveyed or **has not been surveyed** to current standards. A complete archaeological survey will be conducted and submitted for review.

Archaeological Survey

Findings:

Negative - No further archaeological review is required.

Positive - Have avoidance and protection measures been devised? Select one:

Comments:

Project Details:

NMSLO Lease Number (if available):

Cultural Resources Consultant:

Project Proponent (Applicant):

Project Title/Description:

Project Location:

County(ies):

PLSS/Section/Township/Range):

For NMSLO Agency Use Only:

NMSLO Lease Number:

Acknowledgment-Only:

Lease Analyst:

Date Exhibit Routed to Cultural Resources Office:

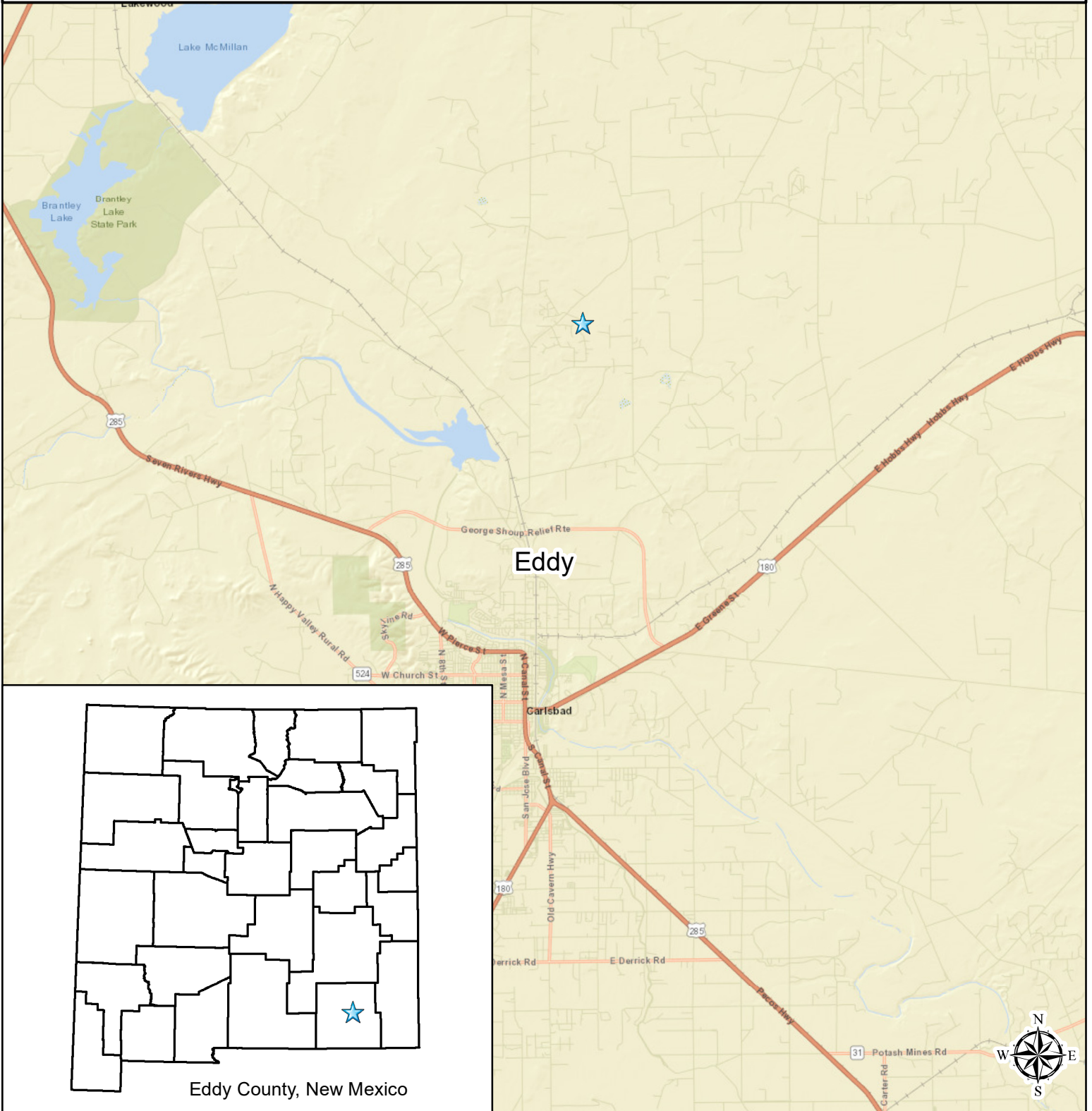
No person may alter the wording of the questions or layout of the cover sheet. The completion of this cover sheet by itself does not authorize anyone to engage in new surface disturbing activity before the review and approvals required by the Cultural Properties Protections Rule.

Form Revised 12 22



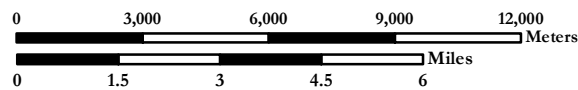
Beaver Creek ARCHAEOLOGY

XTO's Avalon UT 643
Ensolum, LLC
T20S R28E Sec. 32
Angel Draw(1985) Quad. Map
Upper Pecos-Black Drainage
Eddy County, New Mexico



Legend

★ Project Location



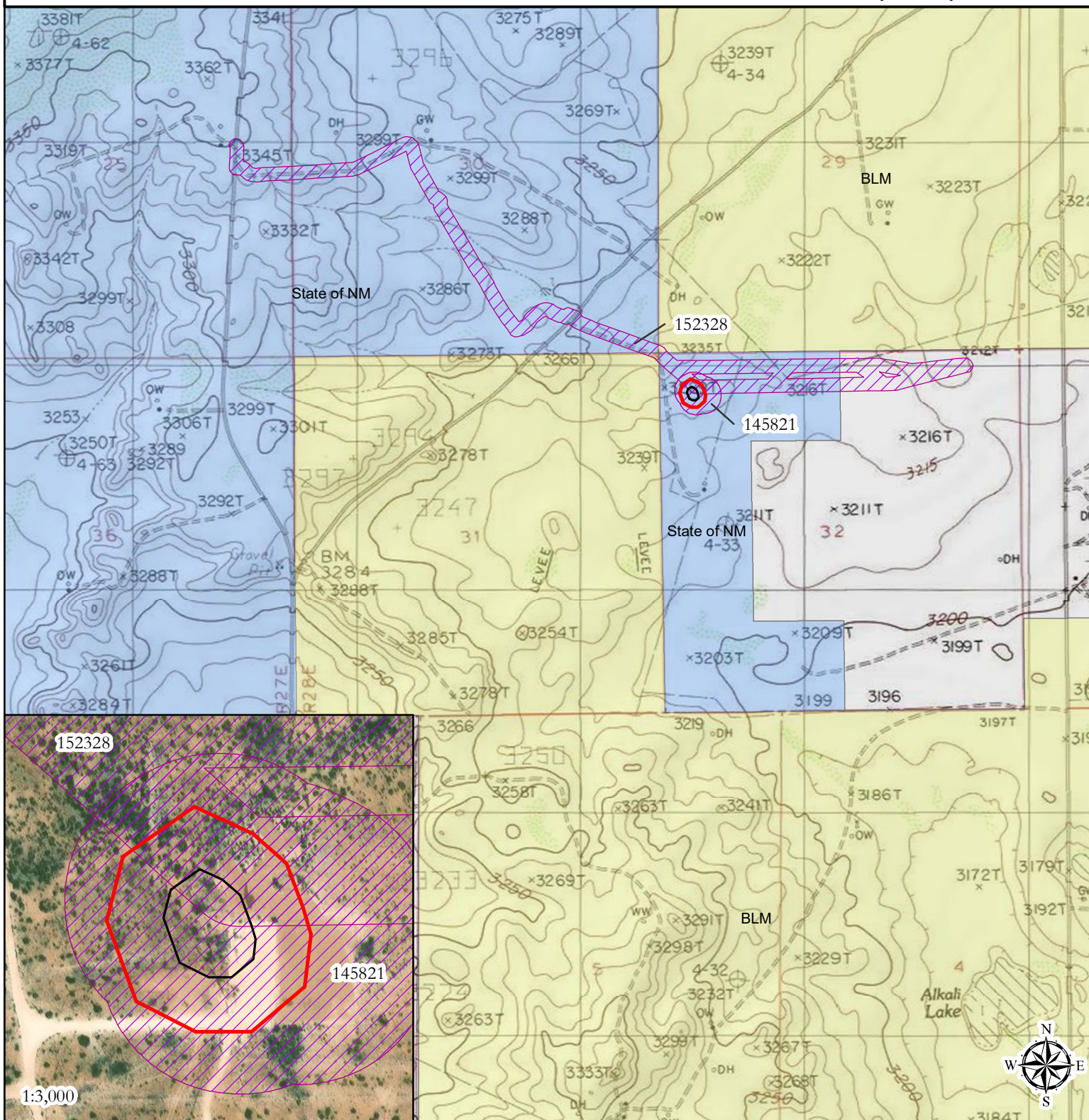
Base Map: USGS 7.5'
Scale: 1:180,000
UTM NAD83 Zone 13



Beaver Creek
ARCHAEOLOGY

REDACTED

XTO's Avalon UT 643
Ensolum, LLC
T20S R28E Sec. 32
Angel Draw (1985) Quad. Map
Upper Pecos-Black Drainage
Eddy County, New Mexico



Legend

- Inventory Area (3 Acres)
- Previously Surveyed (3 Acres)
- Workspace Limits (0.6 Acres)

0 200 400 800 1,200 1,600 Meters
0 0.125 0.25 0.5 0.75 1 Miles

Base Map: USGS 7.5'
Scale: 1:24,000
UTM NAD83 Zone 13

MS



APPENDIX D

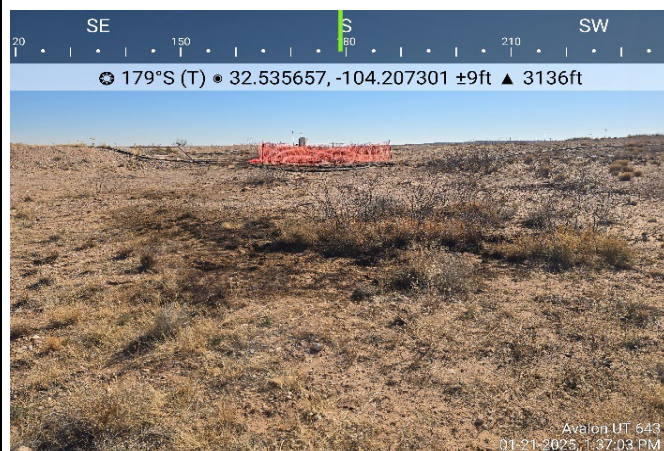
Photographic Log

**Photographic Log**

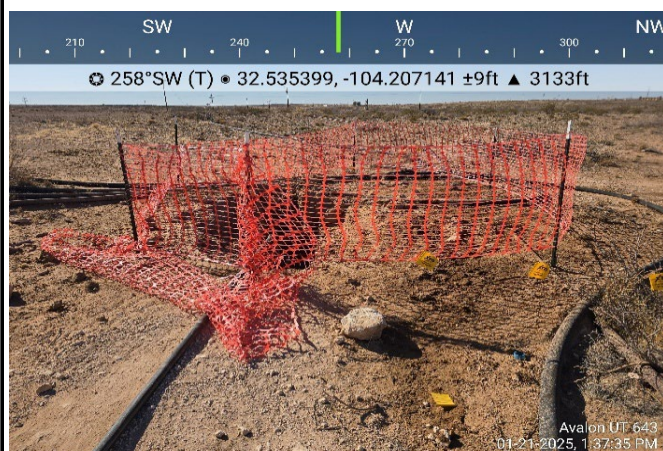
XTO Energy, Inc

Avalon UT 643

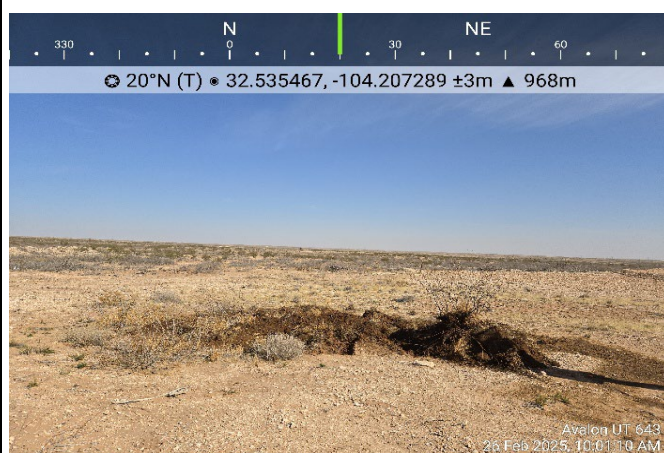
nAPP2501451404



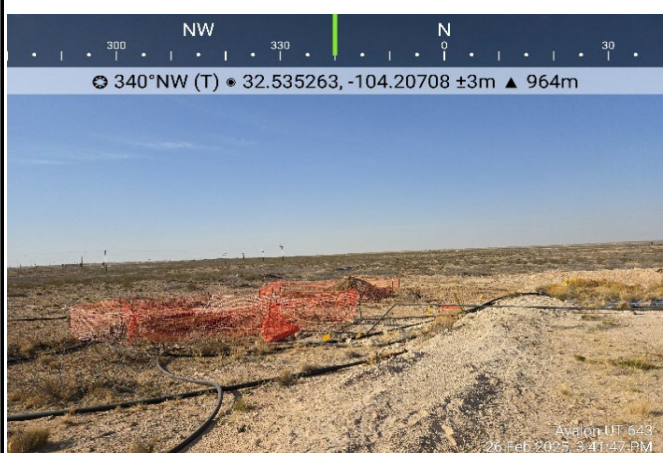
Photograph: 1 Date: 1/21/2025
 Description: Staining in release extent
 View: South



Photograph: 2 Date: 1/21/2025
 Description: Excavation for line repair
 View: West



Photograph: 3 Date: 2/26/2025
 Description: Delineation activities; near PH02
 View: North



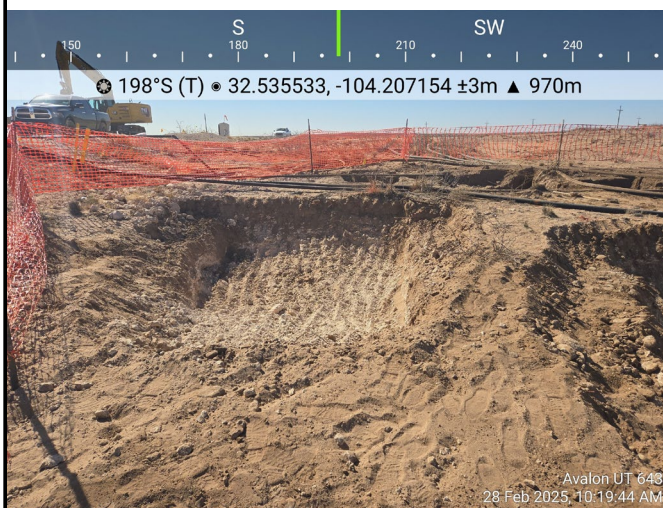
Photograph: 4 Date: 2/26/2025
 Description: Delineation activities; near PH03
 View: North

**Photographic Log**

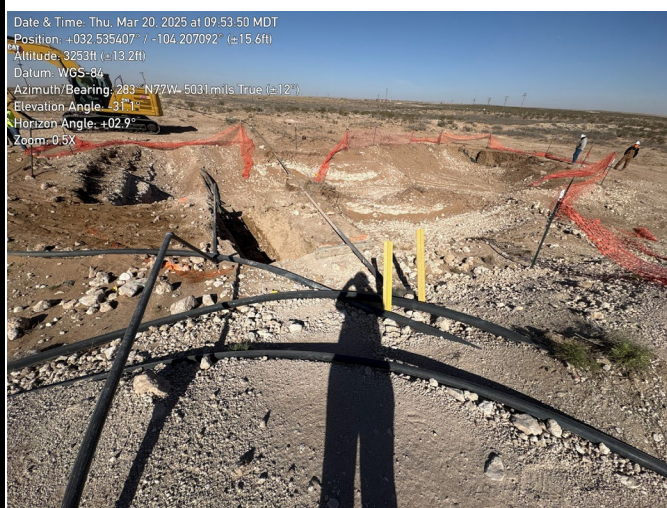
XTO Energy, Inc
Avalon UT 643
nAPP2501451404



Photograph: 5 Date: 2/27/2025
Description: Excavation activities; near FS10
View: North



Photograph: 6 Date: 2/28/2025
Description: Excavation activities; near FS07
View: South



Photograph: 7 Date: 3/20/2025
Description: Excavation activities; near FS14
View: Northwest



Photograph: 8 Date: 3/20/2025
Description: Excavation activities; near FS05
View: Northeast

**Photographic Log**

XTO Energy, Inc

Avalon UT 643

nAPP2501451404

Date & Time: Fri, Mar 21, 2025 at 15:40:13 MDT
 Position: +032.535663° / -104.207265° (±15.6ft)
 Altitude: 3242ft (±13.6ft)
 Datum: WGS-84
 Azimuth/Bearing: 165° S15E 2933mils True (±11°)
 Elevation Angle: -18.3°
 Horizon Angle: +01.6°
 Zoom: 0.5X



Photograph: 9 Date: 3/21/2025
 Description: Excavation activities; near FS16
 View: Southeast

Date & Time: Fri, Mar 21, 2025 at 15:42:13 MDT
 Position: +032.535394° / -104.207155° (±10.5ft)
 Altitude: 3240ft (±9.8ft)
 Datum: WGS-84
 Azimuth/Bearing: 356° N04W 6329mils True (±11°)
 Elevation Angle: -17.9°
 Horizon Angle: +01.5°
 Zoom: 0.5X



Photograph: 10 Date: 3/21/2025
 Description: Excavation activities; near FS13
 View: Northwest

Date & Time: Thu, Mar 13, 2025 at 11:49:04 MDT
 Position: +032.535496° / -104.207268° (±17.9ft)
 Altitude: 3240ft (±13.9ft)
 Datum: WGS-84
 Azimuth/Bearing: 022° N22E 0430mils True (±13°)
 Elevation Angle: -18.6°
 Horizon Angle: +03.1°
 Zoom: 1.0X
 Avalon UT 643



Photograph: 11 Date: 3/13/2025
 Description: Excavation activities; near FS01
 View: Northeast

Date & Time: Thu, Mar 13, 2025 at 13:54:20 MDT
 Position: +032.535527° / -104.207058° (±20.8ft)
 Altitude: 3240ft (±9.8ft)
 Datum: WGS-84
 Azimuth/Bearing: 230° S70W 4444mils True (±12°)
 Elevation Angle: -11.8°
 Horizon Angle: +03.6°
 Zoom: 1.0X
 Avalon UT 643



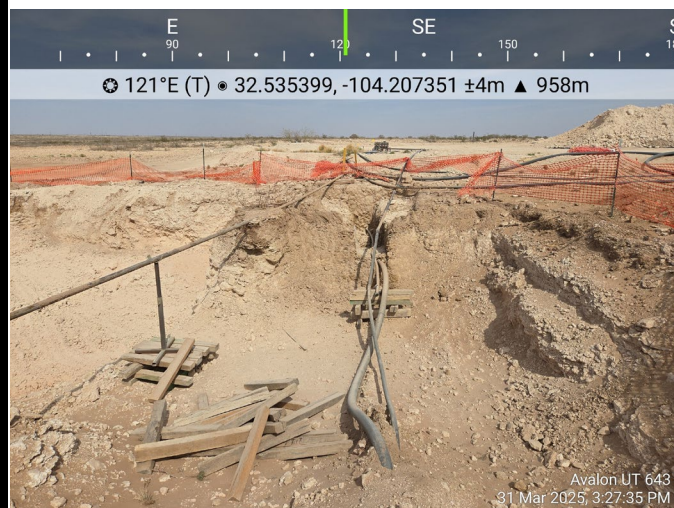
Photograph: 12 Date: 3/13/2025
 Description: Excavation activities; near FS11
 View: Southwest

**Photographic Log**

XTO Energy, Inc

Avalon UT 643

nAPP2501451404



Photograph: 13 Date: 3/31/2025
 Description: Excavation activities; near FS12
 View: Southeast



Photograph: 14 Date: 3/31/2025
 Description: Excavation activities; near FS16
 View: Northeast



Photograph: 15 Date: 4/1/2025
 Description: Excavation activities; near FS16
 View: Northeast



Photograph: 16 Date: 4/2/2025
 Description: Excavation activities; near FS12
 View: Northeast

**Photographic Log**

XTO Energy, Inc

Avalon UT 643

nAPP2501451404



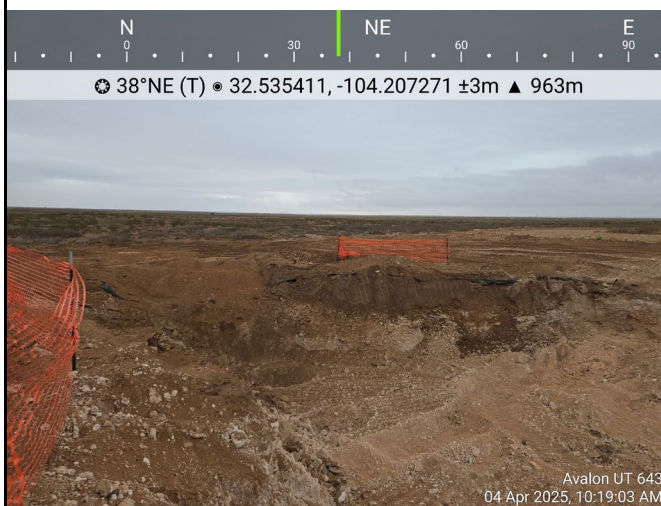
Photograph: 17 Date: 4/3/2025
Description: Excavation activities; near FS10
View: Northwest



Photograph: 18 Date: 4/4/2025
Description: Excavation activities; near FS07
View: Southwest



Photograph: 19 Date: 4/4/2025
Description: Excavation activities; near FS10
View: West



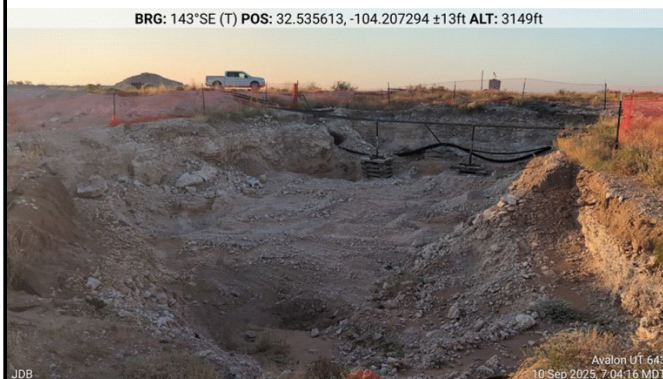
Photograph: 20 Date: 4/4/2025
Description: Excavation activities; near FS06
View: Northeast

**Photographic Log**

XTO Energy, Inc
Avalon UT 643
nAPP2501451404



Photograph: 21 Date: 7/28/2025
Description: Sampling activities; near SW12
View: North



Photograph: 22 Date: 9/10/2025
Description: Sampling activities; near FS05
View: Southeast



Photograph: 23 Date: 9/24/2025
Description: Backfilled excavation
View: Northeast


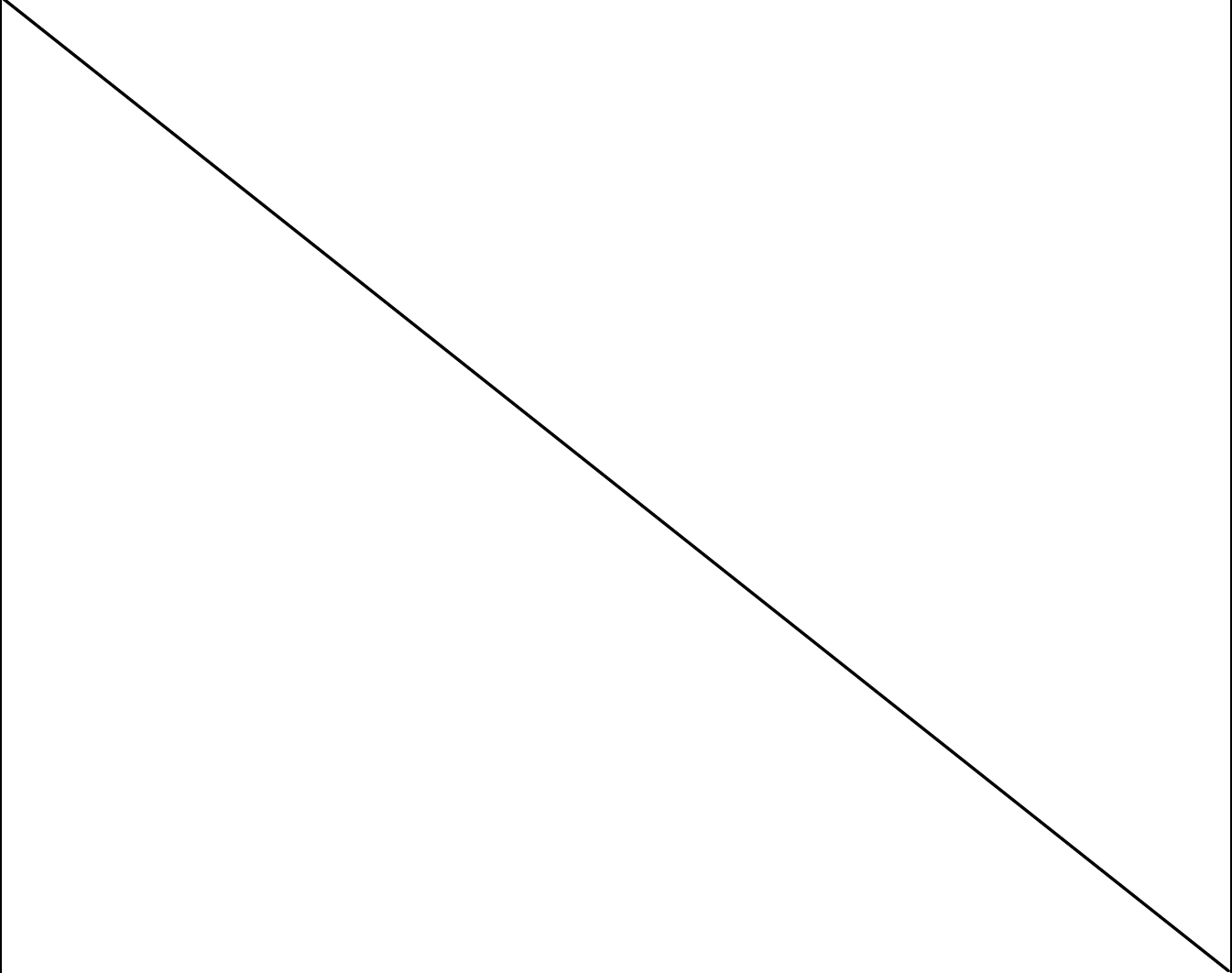



Photograph: 24 Date: 9/24/2025
Description: Backfilled excavation
View: Southwest


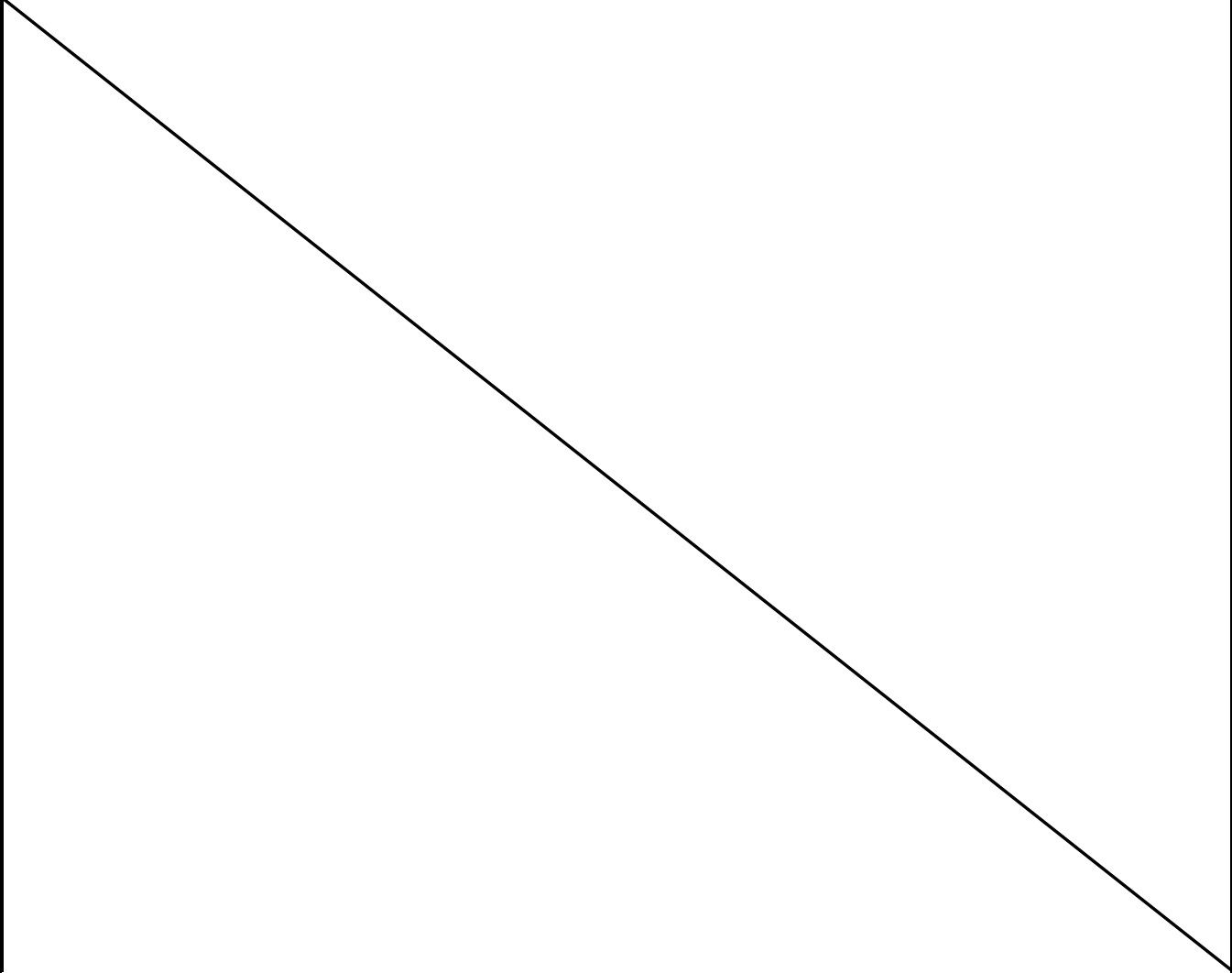


APPENDIX E

Lithologic Soil Sampling Logs

								Sample Name: PH01		Date: 2/26/25	
								Site Name: Avalon UT 643			
								Incident Number: nAPP2501451404			
								Job Number: 03C1558598			
LITHOLOGIC / SOIL SAMPLING LOG								Logged By: Jesse D.		Method: Backhoe	
Coordinates: 32.535365, -104.207160								Hole Diameter: 3'		Total Depth: 1'	
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. 40% correction factors included. Hit a liner from a previous release.											
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample ID	Sample Depth (ft bgs)	Depth (ft bgs)	USCS/Rock Symbol	Lithologic Descriptions			
						0		(0-1') SAND, brown, no odor			
D	1,590	32.9	Y	PH01A	1	1	SP				
Total Depth @ 1-Foot bgs											
											

 ENSOLUM								Sample Name: PH02		Date: 2/26/25	
								Site Name: Avalon UT 643			
								Incident Number: nAPP2501451404			
								Job Number: 03C1558598			
LITHOLOGIC / SOIL SAMPLING LOG								Logged By: Jesse D.		Method: Backhoe	
Coordinates: 32.535468, -104.207208								Hole Diameter: 3'		Total Depth: 9'	
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. 40% correction factors included.											
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample ID	Sample Depth (ft bgs)	Depth (ft bgs)	USCS/Rock Symbol	Lithologic Descriptions			
						0	SP	(0-3') SAND, brown, very fine.			
D	2,296	385.4	Y	PH02A	1	1		Strong odor.			
D	2,654	351.6	Y			2		Odor.			
D	464.8	78.6	N			3	CCHE	(3-9') CALICHE, silty, coarse grain			
D	<162	15.9	N	PH02B	4	4					
						5					
D	414.4	39.8	N	PH02C	6	6					
D	464.8	12.6	N			7					
D	319.2	6.8	N	PH02D	8	8					
D	414.4	5.1	N			9					
Total Depth @ 9 feet bgs											

 ENSOLUM								Sample Name: PH03		Date: 2/26/25	
								Site Name: Avalon UT 643			
								Incident Number: nAPP2501451404			
								Job Number: 03C1558598			
LITHOLOGIC / SOIL SAMPLING LOG								Logged By: Jesse D.		Method: Backhoe	
Coordinates: 32.535559, -104.207242								Hole Diameter: 3'		Total Depth: 1'	
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. 40% correction factors included.											
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample ID	Sample Depth (ft bgs)	Depth (ft bgs)	USCS/Rock Symbol	Lithologic Descriptions			
						0	SP	(0-3') SAND, brown, very fine, strong odor.			
D	5,308	2,394	Y	PH03A	1	1					
Total Depth @ 1-foot bgs											
											



APPENDIX F

Laboratory Analytical Reports & Chain of Custody Documentation



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

January 27, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 01/23/25 14:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 01 0.5 (H250408-01)

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	01/24/2025	ND	2.07	104	2.00	3.35	
Toluene*	<0.050	0.050	01/24/2025	ND	2.09	104	2.00	0.793	
Ethylbenzene*	<0.050	0.050	01/24/2025	ND	2.22	111	2.00	4.46	
Total Xylenes*	<0.150	0.150	01/24/2025	ND	6.81	113	6.00	4.85	
Total BTX	<0.300	0.300	01/24/2025	ND					

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1960	16.0	01/24/2025	ND	432	108	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	01/27/2025	ND	224	112	200	1.57	
DRO >C10-C28*	1160	10.0	01/27/2025	ND	212	106	200	2.83	
EXT DRO >C28-C36	337	10.0	01/27/2025	ND					

Surrogate: 1-Chlorooctane 111 % 48.2-134

Surrogate: 1-Chlorooctadecane 120 % 49.1-148

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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 02 0.5 (H250408-02)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<1.00	1.00	01/24/2025	ND	2.07	104	2.00	3.35	GC-NC
Toluene*	9.43	1.00	01/24/2025	ND	2.09	104	2.00	0.793	GC-NC1
Ethylbenzene*	8.17	1.00	01/24/2025	ND	2.22	111	2.00	4.46	GC-NC1
Total Xylenes*	30.1	3.00	01/24/2025	ND	6.81	113	6.00	4.85	GC-NC1
Total BTEX	47.7	6.00	01/24/2025	ND					GC-NC1

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1380	16.0	01/24/2025	ND	432	108	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS						S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	739	100	01/24/2025	ND	224	112	200	1.57		
DRO >C10-C28*	2130	100	01/24/2025	ND	212	106	200	2.83		
EXT DRO >C28-C36	273	100	01/24/2025	ND						

Surrogate: 1-Chlorooctane 137 % 48.2-134

Surrogate: 1-Chlorooctadecane 117 % 49.1-148

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 03 0.5 (H250408-03)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<1.00	1.00	01/24/2025	ND	2.07	104	2.00	3.35	GC-NC
Toluene*	5.54	1.00	01/24/2025	ND	2.09	104	2.00	0.793	GC-NC1
Ethylbenzene*	5.12	1.00	01/24/2025	ND	2.22	111	2.00	4.46	GC-NC1
Total Xylenes*	19.8	3.00	01/24/2025	ND	6.81	113	6.00	4.85	GC-NC1
Total BTEX	30.5	6.00	01/24/2025	ND					GC-NC1

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	8200	16.0	01/24/2025	ND	432	108	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS						S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	576	100	01/24/2025	ND	224	112	200	1.57		
DRO >C10-C28*	2210	100	01/24/2025	ND	212	106	200	2.83		
EXT DRO >C28-C36	<100	100	01/24/2025	ND						

Surrogate: 1-Chlorooctane 140 % 48.2-134

Surrogate: 1-Chlorooctadecane 105 % 49.1-148

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 04 0.5 (H250408-04)

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	01/24/2025	ND	2.07	104	2.00	3.35		
Toluene*	<0.050	0.050	01/24/2025	ND	2.09	104	2.00	0.793		
Ethylbenzene*	<0.050	0.050	01/24/2025	ND	2.22	111	2.00	4.46		
Total Xylenes*	<0.150	0.150	01/24/2025	ND	6.81	113	6.00	4.85		
Total BTX	<0.300	0.300	01/24/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 123 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	01/24/2025	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	01/24/2025	ND	224	112	200	1.57	
DRO >C10-C28*	<10.0	10.0	01/24/2025	ND	212	106	200	2.83	
EXT DRO >C28-C36	<10.0	10.0	01/24/2025	ND					

Surrogate: 1-Chlorooctane 94.5 % 48.2-134

Surrogate: 1-Chlorooctadecane 85.6 % 49.1-148

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 05 0.5 (H250408-05)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/24/2025	ND	2.07	104	2.00	3.35		
Toluene*	<0.050	0.050	01/24/2025	ND	2.09	104	2.00	0.793		
Ethylbenzene*	<0.050	0.050	01/24/2025	ND	2.22	111	2.00	4.46		
Total Xylenes*	<0.150	0.150	01/24/2025	ND	6.81	113	6.00	4.85		
Total BTEX	<0.300	0.300	01/24/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	416	16.0	01/24/2025	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	01/24/2025	ND	199	99.7	200	0.0601	
DRO >C10-C28*	<10.0	10.0	01/24/2025	ND	192	96.0	200	0.964	
EXT DRO >C28-C36	<10.0	10.0	01/24/2025	ND					

Surrogate: 1-Chlorooctane 62.9 % 48.2-134

Surrogate: 1-Chlorooctadecane 62.9 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 06 0.5 (H250408-06)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/24/2025	ND	2.07	104	2.00	3.35		
Toluene*	<0.050	0.050	01/24/2025	ND	2.09	104	2.00	0.793		
Ethylbenzene*	<0.050	0.050	01/24/2025	ND	2.22	111	2.00	4.46		
Total Xylenes*	<0.150	0.150	01/24/2025	ND	6.81	113	6.00	4.85		
Total BTEX	<0.300	0.300	01/24/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 123 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	01/24/2025	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	01/24/2025	ND	199	99.7	200	0.0601	
DRO >C10-C28*	<10.0	10.0	01/24/2025	ND	192	96.0	200	0.964	
EXT DRO >C28-C36	<10.0	10.0	01/24/2025	ND					

Surrogate: 1-Chlorooctane 91.4 % 48.2-134

Surrogate: 1-Chlorooctadecane 92.1 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 01/23/2025
Reported: 01/27/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535501, -104.207107

Sampling Date: 01/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SS 07 0.5 (H250408-07)

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	01/24/2025	ND	2.07	104	2.00	3.35		
Toluene*	<0.050	0.050	01/24/2025	ND	2.09	104	2.00	0.793		
Ethylbenzene*	<0.050	0.050	01/24/2025	ND	2.22	111	2.00	4.46		
Total Xylenes*	<0.150	0.150	01/24/2025	ND	6.81	113	6.00	4.85		
Total BTX	<0.300	0.300	01/24/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	01/24/2025	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	01/24/2025	ND	199	99.7	200	0.0601	
DRO >C10-C28*	<10.0	10.0	01/24/2025	ND	192	96.0	200	0.964	
EXT DRO >C28-C36	<10.0	10.0	01/24/2025	ND					

Surrogate: 1-Chlorooctane 92.7 % 48.2-134

Surrogate: 1-Chlorooctadecane 92.3 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
GC-NC1	8260 confirmation analysis was performed; initial GC results were not supported by GC/MS analysis and are biased high with interfering compounds.
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

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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				BILL TO				ANALYSIS REQUEST																			
Project Manager:				P.O. #:																							
Address: 3122 National Parks Hwy				Company: XTO																							
City: Carlsbad		State: NM Zip: 88220		Attn: Colton Brown																							
Phone #: 575-937-3906		Fax #:		Address: 3104 E Green St.																							
Project #: 03C1558598		Project Owner:		City: Carlsbad																							
Project Name: Avalon UT 643				State: NM Zip: 88220																							
Project Location: 32.535501, -104.207107				Phone #: 575-988-2390																							
Sampler Name: Mario Sarkis				Fax #:																							
FOR LAB USE ONLY	Lab I.D.	Sample I.D.	Depth (feet)	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX					PRESERV.	SAMPLING															
						GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	ACID/BASE:	ICE / COOL	OTHER	DATE	TIME	BTEX	TPH	Chlorides								
	H250408	1 SS01	0.5	G	1			✓				✓			12/25	1404	✓	✓	✓								
		2 SS02	0.5	G	1			✓				✓				1406	✓	✓	✓								
		3 SS03	0.5	G	1			✓				✓				1407	✓	✓	✓								
		4 SS04	0.5	G	1			✓				✓				1409	✓	✓	✓								
		5 SS05	0.5	G	1			✓				✓				1411	✓	✓	✓								
		6 SS06	0.5	G	1			✓				✓				1416	✓	✓	✓								
		7 SS07	0.5	G	1			✓				✓				1419	✓	✓	✓								

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Relinquished By:	Date: 1-23-25	Received By:	Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:
	Time: 1400		All Results are emailed. Please provide Email address:
Relinquished By:	Date:	Received By:	thillard@ensolum.com / msarkis@ensolum.com / kthompson@ensolum.com
	Time:		REMARKS:
Delivered By: (Circle One)	Observed Temp. °C 1.2	Sample Condition	Incident #: nAPP2501451404 / Cost Center: 1136201001
Sampler - UPS - Bus - Other:	Corrected Temp. °C 0.6	<input type="checkbox"/> Cool <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Yes <input type="checkbox"/> No	Turnaround Time: Standard <input type="checkbox"/> Rush <input checked="" type="checkbox"/>
		CHECKED BY: (Initials)	Bacteria (only) Sample Condition
			Cool Intact Observed Temp. °C
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			Thermometer ID #113
			Correction Factor -0.5°C
			Corrected Temp. °C

FORM-006 R 3.2 10/07/21

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



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

February 28, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 02/27/25 14:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received:	02/27/2025	Sampling Date:	02/26/2025
Reported:	02/28/2025	Sampling Type:	Soil
Project Name:	AVALON UT 643	Sampling Condition:	Cool & Intact
Project Number:	03C1558598	Sample Received By:	Tamara Oldaker
Project Location:	XTO 32.535523, -104.207194		

Sample ID: PH 02 A 1 (H251171-01)

BTX 8021B		mg/kg		Analyzed By: JH				S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	02/28/2025	ND	1.94	97.0	2.00	2.25	
Toluene*	0.257	0.050	02/28/2025	ND	2.01	100	2.00	1.32	
Ethylbenzene*	0.836	0.050	02/28/2025	ND	2.01	100	2.00	0.732	
Total Xylenes*	2.87	0.150	02/28/2025	ND	6.16	103	6.00	1.14	
Total BTX	3.97	0.300	02/28/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 164 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1360	16.0	02/28/2025	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS				S-06	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	182	50.0	02/28/2025	ND	199	99.5	200	0.357	
DRO >C10-C28*	1850	50.0	02/28/2025	ND	196	98.1	200	1.71	
EXT DRO >C28-C36	500	50.0	02/28/2025	ND					

Surrogate: 1-Chlorooctane 127 % 48.2-134

Surrogate: 1-Chlorooctadecane 155 % 49.1-148

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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 02/27/2025
Reported: 02/28/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/26/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: PH 02 B 4 (H251171-02)

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	02/27/2025	ND	1.94	97.0	2.00	2.25		
Toluene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	1.32		
Ethylbenzene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	0.732		
Total Xylenes*	<0.150	0.150	02/27/2025	ND	6.16	103	6.00	1.14		
Total BTX	<0.300	0.300	02/27/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 108 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	80.0	16.0	02/28/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	02/28/2025	ND	199	99.5	200	0.357	
DRO >C10-C28*	<10.0	10.0	02/28/2025	ND	196	98.1	200	1.71	
EXT DRO >C28-C36	<10.0	10.0	02/28/2025	ND					

Surrogate: 1-Chlorooctane 94.6 % 48.2-134

Surrogate: 1-Chlorooctadecane 96.6 % 49.1-148

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 02/27/2025
Reported: 02/28/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/26/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: PH 02 C 6 (H251171-03)

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	02/27/2025	ND	1.94	97.0	2.00	2.25	
Toluene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	1.32	
Ethylbenzene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	0.732	
Total Xylenes*	<0.150	0.150	02/27/2025	ND	6.16	103	6.00	1.14	
Total BTX	<0.300	0.300	02/27/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 108 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	352	16.0	02/28/2025	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	02/28/2025	ND	199	99.5	200	0.357	
DRO >C10-C28*	33.6	10.0	02/28/2025	ND	196	98.1	200	1.71	
EXT DRO >C28-C36	<10.0	10.0	02/28/2025	ND					

Surrogate: 1-Chlorooctane 92.9 % 48.2-134

Surrogate: 1-Chlorooctadecane 96.2 % 49.1-148

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 02/27/2025
Reported: 02/28/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/26/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: PH 02 D 9 (H251171-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/27/2025	ND	1.94	97.0	2.00	2.25		
Toluene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	1.32		
Ethylbenzene*	<0.050	0.050	02/27/2025	ND	2.01	100	2.00	0.732		
Total Xylenes*	<0.150	0.150	02/27/2025	ND	6.16	103	6.00	1.14		
Total BTEX	<0.300	0.300	02/27/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 108 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	416	16.0	02/28/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	02/28/2025	ND	199	99.5	200	0.357	
DRO >C10-C28*	<10.0	10.0	02/28/2025	ND	196	98.1	200	1.71	
EXT DRO >C28-C36	<10.0	10.0	02/28/2025	ND					

Surrogate: 1-Chlorooctane 96.4 % 48.2-134

Surrogate: 1-Chlorooctadecane 98.9 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 02/27/2025
Reported: 02/28/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/26/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: PH 01 A 1 (H251171-05)

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	02/27/2025	ND	1.81	90.6	2.00	0.466	QM-07	
Toluene*	<0.050	0.050	02/27/2025	ND	2.05	102	2.00	4.23		
Ethylbenzene*	<0.050	0.050	02/27/2025	ND	2.25	113	2.00	6.19		
Total Xylenes*	<0.150	0.150	02/27/2025	ND	6.74	112	6.00	6.30		
Total BTX	<0.300	0.300	02/27/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2000	16.0	02/28/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	02/28/2025	ND	199	99.5	200	0.357	
DRO >C10-C28*	<10.0	10.0	02/28/2025	ND	196	98.1	200	1.71	
EXT DRO >C28-C36	<10.0	10.0	02/28/2025	ND					

Surrogate: 1-Chlorooctane 92.8 % 48.2-134

Surrogate: 1-Chlorooctadecane 94.5 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 02/27/2025
Reported: 02/28/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/26/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: PH 03 A 1 (H251171-06)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	9.04	1.00	02/27/2025	ND	1.81	90.6	2.00	0.466	GC-NC1
Toluene*	40.3	1.00	02/27/2025	ND	2.05	102	2.00	4.23	
Ethylbenzene*	28.4	1.00	02/27/2025	ND	2.25	113	2.00	6.19	
Total Xylenes*	78.2	3.00	02/27/2025	ND	6.74	112	6.00	6.30	
Total BTEX	156	6.00	02/27/2025	ND					GC-NC1

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	5120	16.0	02/28/2025	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS						S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	5020	50.0	02/28/2025	ND	199	99.5	200	0.357		
DRO >C10-C28*	10700	50.0	02/28/2025	ND	196	98.1	200	1.71		
EXT DRO >C28-C36	1820	50.0	02/28/2025	ND						

Surrogate: 1-Chlorooctane 334 % 48.2-134

Surrogate: 1-Chlorooctadecane 163 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager

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Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
GC-NC1	8260 confirmation analysis was performed; initial GC results were not supported by GC/MS analysis and are biased high with interfering compounds.
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 black ink, appearing to read "Celey D. Keene", is written over a horizontal line.

Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Ensolum, LLC				BILL TO				ANALYSIS REQUEST																		
Project Manager: Tracy Hillard				P.O. #:																						
Address: 3122 National Parks Hwy				Company: XTO Energy Inc.																						
City: Carlsbad State: NM Zip: 88220				Attn: Colton Brown																						
Phone #: 575-937-3906 Fax #:				Address: 3104 E. Green St.																						
Project #: 03C1558598 Project Owner: XTO				City: Carlsbad																						
Project Name: Avalon UT 643				State: NM Zip: 88220																						
Project Location: 32.535523, -104.207194				Phone #:																						
Sampler Name: Jesse Dorman				Fax #:																						
FOR LAB USE ONLY																										
Lab I.D.	Sample I.D.	Sample Depth (feet)	(GRAB OR C/COMP. # CONTAINERS)	MATRIX					PRESERV.	SAMPLING		BTEX	TPH	CHLORIDE	PH											
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL													OTHER :	DATE	TIME
H251171	Pho2A	1	6										2/26/25	10:05												
1	Pho2B	4	1											10:20												
2	Pho2C	6	1											10:55												
3	Pho2D	7	1											13:25												
4	Pho1A	1	1											13:15												
5	Pho3A	1	1											13:40												
6																										

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Relinquished By:	Date: 2-27-25 Time: 1400	Received By:	Verbal Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Phone #:
Relinquished By:	Date:	Received By:	All Results are emailed. Please provide Email address: Thillard@ensolum.com BBelilli@ensolum.com TMorrissey@ensolum.com, kthomason@ensolum.com
Delivered By: (Circle One)	Observed Temp. °C 3.1	Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	REMARKS: Cost Center: 1136201001 Incident ID: nAPP2501451404
Sampler - UPS - Bus - Other:	Corrected Temp. °C 3.4	CHECKED BY: (Initials) YO	Turnaround Time: Standard <input type="checkbox"/> Rush <input checked="" type="checkbox"/> Bacteria (only) Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Observed Temp. °C
			Thermometer ID #113 Correction Factor -0.5°C #140 YO - 2/27/25



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

March 05, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 03/04/25 14:05.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 01 4' (H251275-01)

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	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTEx	<0.300	0.300	03/04/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1570	16.0	03/05/2025	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	03/04/2025	ND	194	97.0	200	3.72	
DRO >C10-C28*	19.9	10.0	03/04/2025	ND	187	93.3	200	3.75	
EXT DRO >C28-C36	<10.0	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 75.8 % 71.8-148

Surrogate: 1-Chlorooctadecane 76.5 % 63.9-155

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 02 4' (H251275-02)

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	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTX	<0.300	0.300	03/04/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	240	16.0	03/05/2025	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS				S-06	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<50.0	50.0	03/04/2025	ND	194	97.0	200	3.72	
DRO >C10-C28*	5100	50.0	03/04/2025	ND	187	93.3	200	3.75	
EXT DRO >C28-C36	1460	50.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 96.7 % 71.8-148

Surrogate: 1-Chlorooctadecane 175 % 63.9-155

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 03 4' (H251275-03)

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	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTX	<0.300	0.300	03/04/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	64.0	16.0	03/05/2025	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	03/04/2025	ND	194	97.0	200	3.72	
DRO >C10-C28*	268	10.0	03/04/2025	ND	187	93.3	200	3.75	
EXT DRO >C28-C36	113	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 90.3 % 71.8-148

Surrogate: 1-Chlorooctadecane 89.4 % 63.9-155

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 04 4' (H251275-04)

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	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTX	<0.300	0.300	03/04/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 114 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	496	16.0	03/05/2025	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	03/04/2025	ND	196	97.8	200	5.62	
DRO >C10-C28*	763	10.0	03/04/2025	ND	191	95.7	200	6.13	QM-07
EXT DRO >C28-C36	239	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 92.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 92.2 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 05 4' (H251275-05)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	0.095	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTEx	<0.300	0.300	03/04/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	784	16.0	03/05/2025	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	03/04/2025	ND	196	97.8	200	5.62	
DRO >C10-C28*	3080	10.0	03/04/2025	ND	191	95.7	200	6.13	
EXT DRO >C28-C36	816	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 89.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 127 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 06 4' (H251275-06)

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	03/05/2025	ND	1.91	95.6	2.00	11.2	
Toluene*	0.312	0.050	03/05/2025	ND	2.23	112	2.00	10.8	
Ethylbenzene*	1.57	0.050	03/05/2025	ND	2.29	114	2.00	12.2	GC-NC1
Total Xylenes*	2.32	0.150	03/05/2025	ND	7.03	117	6.00	12.3	
Total BTX	4.20	0.300	03/05/2025	ND					GC-NC1

Surrogate: 4-Bromofluorobenzene (PID) 130 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	912	16.0	03/05/2025	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*	89.7	10.0	03/04/2025	ND	196	97.8	200	5.62	
DRO >C10-C28*	1350	10.0	03/04/2025	ND	191	95.7	200	6.13	
EXT DRO >C28-C36	363	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 97.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 104 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SW 01 0-4' (H251275-07)

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	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTX	<0.300	0.300	03/04/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	720	16.0	03/05/2025	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	03/04/2025	ND	196	97.8	200	5.62	
DRO >C10-C28*	13.8	10.0	03/04/2025	ND	191	95.7	200	6.13	
EXT DRO >C28-C36	11.1	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 80.9 % 44.4-145

Surrogate: 1-Chlorooctadecane 80.2 % 40.6-153

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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SW 02 0-4' (H251275-08)

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	03/04/2025	ND	1.91	95.6	2.00	11.2	
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8	
Ethylbenzene*	0.601	0.050	03/04/2025	ND	2.29	114	2.00	12.2	GC-NC1
Total Xylenes*	1.32	0.150	03/04/2025	ND	7.03	117	6.00	12.3	
Total BTX	1.92	0.300	03/04/2025	ND					GC-NC1

Surrogate: 4-Bromofluorobenzene (PID) 131 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1340	16.0	03/05/2025	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*	135	10.0	03/04/2025	ND	196	97.8	200	5.62		
DRO >C10-C28*	3440	10.0	03/04/2025	ND	191	95.7	200	6.13		
EXT DRO >C28-C36	611	10.0	03/04/2025	ND						

Surrogate: 1-Chlorooctane 113 % 44.4-145

Surrogate: 1-Chlorooctadecane 168 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/04/2025
Reported: 03/05/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 02/28/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: SW 03 0-4' (H251275-09)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/04/2025	ND	1.91	95.6	2.00	11.2		
Toluene*	<0.050	0.050	03/04/2025	ND	2.23	112	2.00	10.8		
Ethylbenzene*	<0.050	0.050	03/04/2025	ND	2.29	114	2.00	12.2		
Total Xylenes*	<0.150	0.150	03/04/2025	ND	7.03	117	6.00	12.3		
Total BTEX	<0.300	0.300	03/04/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 111 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	640	16.0	03/05/2025	ND	480	120	400	18.2		

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	03/04/2025	ND	196	97.8	200	5.62	
DRO >C10-C28*	70.4	10.0	03/04/2025	ND	191	95.7	200	6.13	
EXT DRO >C28-C36	21.6	10.0	03/04/2025	ND					

Surrogate: 1-Chlorooctane 79.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 80.7 % 40.6-153

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Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
GC-NC1	8260 confirmation analysis was performed; initial GC results were not supported by GC/MS analysis and are biased high with interfering compounds.
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 black ink, appearing to read "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO										ANALYSIS REQUEST										
Company Name: Ensolum, LLC										P.O. #:										
Project Manager: Tracy Hillard										Company: XTO Energy Inc.										
Address: 3122 National Parks Hwy										Attn: Colton Brown										
City: Carlsbad State: NM Zip: 88220										Address: 3104 E. Green St.										
Phone #: 575-937-3906 Fax #:										City: Carlsbad										
Project #: 03C1558598 Project Owner: XTO										State: NM Zip: 88220										
Project Name: Avalon UT 643										Phone #:										
Project Location: 32.535523, -104.207194										Fax #:										
Sampler Name: Jesse Dorman																				
Lab I.D.	Sample I.D.	Sample Depth (feet)	(GRAB OR (C)OMP. # CONTAINERS	MATRIX					PRESERV.	SAMPLING		BTEX	TPH	CHLORIDE						
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	ACID/BASE	ICE / COOL	OTHER	DATE	TIME						
4251275																				
1	fs01	4'	1										2/28/25	1202						
2	fs02													1205						
3	fs03													1208						
4	fs04													1210						
5	fs05													1225						
6	fs06													1230						
7	sw01	0-4'												1235						
8	sw02													1240						
9	sw03													1245						

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Relinquished By:		Date: 3-4-25	Received By: <i>S. Lockridge</i>		Verbal Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Phone #:	
Time: 1405				All Results are emailed. Please provide Email address: Thillard@ensolum.com		
Relinquished By:		Date:	Received By:		BBelill@ensolum.com TMorrissey@ensolum.com, kthomason@ensolum.com	
Time:				REMARKS: Cost Center: 1136201001 Incident ID: nAPP2501451404		
Delivered By: (Circle One)		Observed Temp. °C: 1.2	Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Turnaround Time: #140 to 3: Standard Rush <input checked="" type="checkbox"/> Bacteria (only) Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sampler - UPS - Bus - Other:		Corrected Temp. °C: 0.9	CHECKED BY: (Initials) <i>SK</i>		Thermometer ID: #113 Correction Factor: -0.5°C	
				Corrected Temp. °C		



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

March 18, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 03/17/25 12:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/17/2025
Reported: 03/18/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/13/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Shalyn Rodriguez

Sample ID: FS 07 5' (H251544-01)

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	03/17/2025	ND	1.90	95.1	2.00	0.572		
Toluene*	<0.050	0.050	03/17/2025	ND	2.01	100	2.00	0.458		
Ethylbenzene*	<0.050	0.050	03/17/2025	ND	1.99	99.6	2.00	1.63		
Total Xylenes*	<0.150	0.150	03/17/2025	ND	5.81	96.9	6.00	1.49		
Total BTEX	<0.300	0.300	03/17/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 86.3 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	368	16.0	03/18/2025	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/17/2025	ND	195	97.5	200	0.215	
DRO >C10-C28*	596	10.0	03/17/2025	ND	186	92.8	200	0.862	
EXT DRO >C28-C36	46.1	10.0	03/17/2025	ND					

Surrogate: 1-Chlorooctane 82.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 94.1 % 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

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 black ink, appearing to read "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager

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



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

March 25, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 03/24/25 12:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/24/2025
Reported: 03/25/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 07 8' (H251698-01)

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	03/24/2025	ND	1.96	98.1	2.00	4.18		
Toluene*	<0.050	0.050	03/24/2025	ND	2.13	106	2.00	4.31		
Ethylbenzene*	<0.050	0.050	03/24/2025	ND	2.30	115	2.00	4.60		
Total Xylenes*	<0.150	0.150	03/24/2025	ND	6.94	116	6.00	4.70		
Total BTEx	<0.300	0.300	03/24/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 130 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	480	16.0	03/25/2025	ND	416	104	400	3.77		

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	03/24/2025	ND	190	95.2	200	0.331	
DRO >C10-C28*	<10.0	10.0	03/24/2025	ND	195	97.5	200	1.17	
EXT DRO >C28-C36	<10.0	10.0	03/24/2025	ND					

Surrogate: 1-Chlorooctane 84.5 % 44.4-145

Surrogate: 1-Chlorooctadecane 80.0 % 40.6-153

Cardinal Laboratories

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/24/2025
Reported: 03/25/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 03 6' (H251698-02)

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	03/24/2025	ND	1.96	98.1	2.00	4.18	
Toluene*	<0.050	0.050	03/24/2025	ND	2.13	106	2.00	4.31	
Ethylbenzene*	<0.050	0.050	03/24/2025	ND	2.30	115	2.00	4.60	
Total Xylenes*	<0.150	0.150	03/24/2025	ND	6.94	116	6.00	4.70	
Total BTEX	<0.300	0.300	03/24/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 131 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	432	16.0	03/25/2025	ND	416	104	400	3.77	

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	03/24/2025	ND	190	95.2	200	0.331	
DRO >C10-C28*	341	10.0	03/24/2025	ND	195	97.5	200	1.17	
EXT DRO >C28-C36	93.3	10.0	03/24/2025	ND					

Surrogate: 1-Chlorooctane 66.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 75.0 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/24/2025
Reported: 03/25/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 06 10' (H251698-03)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/24/2025	ND	1.96	98.1	2.00	4.18	
Toluene*	<0.050	0.050	03/24/2025	ND	2.13	106	2.00	4.31	
Ethylbenzene*	<0.050	0.050	03/24/2025	ND	2.30	115	2.00	4.60	
Total Xylenes*	<0.150	0.150	03/24/2025	ND	6.94	116	6.00	4.70	
Total BTEx	<0.300	0.300	03/24/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 129 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	416	16.0	03/25/2025	ND	416	104	400	3.77	

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	03/24/2025	ND	190	95.2	200	0.331	
DRO >C10-C28*	43.2	10.0	03/24/2025	ND	195	97.5	200	1.17	
EXT DRO >C28-C36	15.1	10.0	03/24/2025	ND					

Surrogate: 1-Chlorooctane 88.0 % 44.4-145

Surrogate: 1-Chlorooctadecane 86.9 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/24/2025
Reported: 03/25/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SW 05 0-8' (H251698-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/24/2025	ND	1.79	89.7	2.00	16.9		
Toluene*	<0.050	0.050	03/24/2025	ND	1.92	96.2	2.00	16.0		
Ethylbenzene*	<0.050	0.050	03/24/2025	ND	1.96	97.8	2.00	15.3		
Total Xylenes*	<0.150	0.150	03/24/2025	ND	6.04	101	6.00	11.8		
Total BTEx	<0.300	0.300	03/24/2025	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	432	16.0	03/25/2025	ND	416	104	400	3.77		

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	03/25/2025	ND	190	95.2	200	0.331	
DRO >C10-C28*	205	10.0	03/25/2025	ND	195	97.5	200	1.17	
EXT DRO >C28-C36	53.2	10.0	03/25/2025	ND					

Surrogate: 1-Chlorooctane 75.5 % 44.4-145

Surrogate: 1-Chlorooctadecane 78.8 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 03/24/2025
Reported: 03/25/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523, -104.207194

Sampling Date: 03/21/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SW 04 0-8' (H251698-05)

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	03/24/2025	ND	1.79	89.7	2.00	16.9		
Toluene*	<0.050	0.050	03/24/2025	ND	1.92	96.2	2.00	16.0		
Ethylbenzene*	<0.050	0.050	03/24/2025	ND	1.96	97.8	2.00	15.3		
Total Xylenes*	<0.150	0.150	03/24/2025	ND	6.04	101	6.00	11.8		
Total BTX	<0.300	0.300	03/24/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	192	16.0	03/25/2025	ND	416	104	400	3.77		

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	03/25/2025	ND	190	95.2	200	0.331	
DRO >C10-C28*	25.0	10.0	03/25/2025	ND	195	97.5	200	1.17	
EXT DRO >C28-C36	10.3	10.0	03/25/2025	ND					

Surrogate: 1-Chlorooctane 80.1 % 44.4-145

Surrogate: 1-Chlorooctadecane 78.1 % 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

Notes and Definitions

QR-04	The RPD for the BS/BSD was outside of historical limits.
BS-3	Blank spike recovery outside of lab established statistical limits, but still within method limits. Data is not adversely affected.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

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

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

[illegible]

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Relinquished By: <i>Shirley Bruns</i>		Date: <i>3/21/25</i>	Received By:	Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:	
		Time: <i>16:53</i>		All Results are emailed. Please provide Email address:	
Relinquished By:		Date: <i>3-24-25</i>	Received By: <i>Theresa Oldaker</i>	REMARKS:	
		Time: <i>7:41ZIS</i>			
Delivered By: (Circle One)	Observed Temp. °C	Sample Condition	CHECKED BY: (Initials)	Turnaround Time: <i>24 hr</i>	Bacteria (only) Sample Condition
Sampler - UPS - Bus - Other:	Corrected Temp. °C	Cool <input type="checkbox"/> Intact <input type="checkbox"/>		<i>Standard</i> <input checked="" type="checkbox"/> <i>Rush</i> <input type="checkbox"/>	Cool <input checked="" type="checkbox"/> Intact <input type="checkbox"/>
		Yes <input type="checkbox"/> No <input type="checkbox"/>	<i>TO</i>	Thermometer ID #113	Yes <input type="checkbox"/> No <input type="checkbox"/>
		Yes <input type="checkbox"/> No <input type="checkbox"/>		Correction Factor -0.5	Yes <input type="checkbox"/> No <input type="checkbox"/>

FORM-006 R 3.2 10/07/21

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



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

April 02, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 04/01/25 13:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/01/2025
Reported: 04/02/2025
Project Name: AVALON UT 643
Project Number: 03C1558598 - SPILLS
Project Location: XTO 32.20165, -103.77801

Sampling Date: 03/31/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 02 8' (H251917-01)

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	04/01/2025	ND	2.16	108	2.00	3.02		
Toluene*	<0.050	0.050	04/01/2025	ND	2.18	109	2.00	3.13		
Ethylbenzene*	<0.050	0.050	04/01/2025	ND	2.10	105	2.00	3.15		
Total Xylenes*	<0.150	0.150	04/01/2025	ND	6.24	104	6.00	3.46		
Total BTX	<0.300	0.300	04/01/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 101 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	752	16.0	04/02/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	202	101	200	0.348	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	204	102	200	0.205	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane 88.3 % 44.4-145

Surrogate: 1-Chlorooctadecane 83.5 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/01/2025
Reported: 04/02/2025
Project Name: AVALON UT 643
Project Number: 03C1558598 - SPILLS
Project Location: XTO 32.20165, -103.77801

Sampling Date: 03/31/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 03 8' (H251917-02)

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	04/01/2025	ND	2.16	108	2.00	3.02		
Toluene*	<0.050	0.050	04/01/2025	ND	2.18	109	2.00	3.13		
Ethylbenzene*	<0.050	0.050	04/01/2025	ND	2.10	105	2.00	3.15		
Total Xylenes*	<0.150	0.150	04/01/2025	ND	6.24	104	6.00	3.46		
Total BTEx	<0.300	0.300	04/01/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 102 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	272	16.0	04/02/2025	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	202	101	200	0.348	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	204	102	200	0.205	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane 61.0 % 44.4-145

Surrogate: 1-Chlorooctadecane 57.4 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/01/2025
Reported: 04/02/2025
Project Name: AVALON UT 643
Project Number: 03C1558598 - SPILLS
Project Location: XTO 32.20165, -103.77801

Sampling Date: 03/31/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 05 8' (H251917-03)

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	04/01/2025	ND	2.16	108	2.00	3.02		
Toluene*	<0.050	0.050	04/01/2025	ND	2.18	109	2.00	3.13		
Ethylbenzene*	<0.050	0.050	04/01/2025	ND	2.10	105	2.00	3.15		
Total Xylenes*	<0.150	0.150	04/01/2025	ND	6.24	104	6.00	3.46		
Total BTX	<0.300	0.300	04/01/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 101 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1010	16.0	04/02/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	202	101	200	0.348	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	204	102	200	0.205	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane 90.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 86.9 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/01/2025
Reported: 04/02/2025
Project Name: AVALON UT 643
Project Number: 03C1558598 - SPILLS
Project Location: XTO 32.20165, -103.77801

Sampling Date: 03/31/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 08 8' (H251917-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/01/2025	ND	2.16	108	2.00	3.02		
Toluene*	<0.050	0.050	04/01/2025	ND	2.18	109	2.00	3.13		
Ethylbenzene*	<0.050	0.050	04/01/2025	ND	2.10	105	2.00	3.15		
Total Xylenes*	<0.150	0.150	04/01/2025	ND	6.24	104	6.00	3.46		
Total BTEX	<0.300	0.300	04/01/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 101 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	608	16.0	04/02/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	202	101	200	0.348	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	204	102	200	0.205	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane 92.5 % 44.4-145

Surrogate: 1-Chlorooctadecane 88.4 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/01/2025
Reported: 04/02/2025
Project Name: AVALON UT 643
Project Number: 03C1558598 - SPILLS
Project Location: XTO 32.20165, -103.77801

Sampling Date: 03/31/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS 09 8' (H251917-05)

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	04/01/2025	ND	2.16	108	2.00	3.02		
Toluene*	<0.050	0.050	04/01/2025	ND	2.18	109	2.00	3.13		
Ethylbenzene*	<0.050	0.050	04/01/2025	ND	2.10	105	2.00	3.15		
Total Xylenes*	<0.150	0.150	04/01/2025	ND	6.24	104	6.00	3.46		
Total BTX	<0.300	0.300	04/01/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 101 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	720	16.0	04/02/2025	ND	480	120	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	04/01/2025	ND	202	101	200	0.348	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	204	102	200	0.205	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane 70.3 % 44.4-145

Surrogate: 1-Chlorooctadecane 65.9 % 40.6-153

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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

Cardinal Laboratories

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A handwritten signature in black ink, appearing to read "C. D. Keene".

Celey D. Keene, Lab Director/Quality Manager

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



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

April 04, 2025

TRACY HILLARD

ENSOLUM, LLC

705 W WADLEY AVE.

MIDLAND, TX 79705

RE: AVALON UT 643 - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 04/03/25 13:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FS 01 8' (H251970-01)

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	04/03/2025	ND	2.04	102	2.00	1.84	
Toluene*	<0.050	0.050	04/03/2025	ND	2.10	105	2.00	1.85	
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.05	102	2.00	2.03	
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.01	100	6.00	1.81	
Total BTX	<0.300	0.300	04/03/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.1 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	528	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 91.9 % 44.4-145

Surrogate: 1-Chlorooctadecane 95.8 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FS 04 8' (H251970-02)

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	04/03/2025	ND	2.04	102	2.00	1.84		
Toluene*	<0.050	0.050	04/03/2025	ND	2.10	105	2.00	1.85		
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.05	102	2.00	2.03		
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.01	100	6.00	1.81		
Total BTEX	<0.300	0.300	04/03/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.5 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	288	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 91.9 % 44.4-145

Surrogate: 1-Chlorooctadecane 95.8 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW 06 4-8' (H251970-03)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/03/2025	ND	2.04	102	2.00	1.84	
Toluene*	<0.050	0.050	04/03/2025	ND	2.10	105	2.00	1.85	
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.05	102	2.00	2.03	
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.01	100	6.00	1.81	
Total BTEX	<0.300	0.300	04/03/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.0 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1550	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 79.4 % 44.4-145

Surrogate: 1-Chlorooctadecane 79.0 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW 08 4-8' (H251970-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/03/2025	ND	1.87	93.6	2.00	1.29		
Toluene*	<0.050	0.050	04/03/2025	ND	1.98	99.2	2.00	2.64		
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.02	101	2.00	3.47		
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.30	105	6.00	2.68		
Total BTEx	<0.300	0.300	04/03/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	240	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 87.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 89.1 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW 09 4-8' (H251970-05)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/03/2025	ND	1.87	93.6	2.00	1.29		
Toluene*	<0.050	0.050	04/03/2025	ND	1.98	99.2	2.00	2.64		
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.02	101	2.00	3.47		
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.30	105	6.00	2.68		
Total BTEX	<0.300	0.300	04/03/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 120 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	400	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	29.3	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 84.6 % 44.4-145

Surrogate: 1-Chlorooctadecane 84.8 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW 10 0-4' (H251970-06)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/03/2025	ND	1.87	93.6	2.00	1.29		
Toluene*	<0.050	0.050	04/03/2025	ND	1.98	99.2	2.00	2.64		
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.02	101	2.00	3.47		
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.30	105	6.00	2.68		
Total BTEx	<0.300	0.300	04/03/2025	ND						

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	96.0	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	201	101	200	1.98	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	202	101	200	0.521	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 88.8 % 44.4-145

Surrogate: 1-Chlorooctadecane 91.0 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/01/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FS 10 6' (H251970-07)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/03/2025	ND	1.87	93.6	2.00	1.29		
Toluene*	<0.050	0.050	04/03/2025	ND	1.98	99.2	2.00	2.64		
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.02	101	2.00	3.47		
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.30	105	6.00	2.68		
Total BTEx	<0.300	0.300	04/03/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	64.0	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	210	105	200	5.48	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	208	104	200	5.86	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 92.2 % 44.4-145

Surrogate: 1-Chlorooctadecane 85.1 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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

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A handwritten signature in black ink, appearing to read "Celey D. Keene", is written over a horizontal line.

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

[illegible]

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



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

April 04, 2025

TRACY HILLARD

ENSOLUM, LLC

705 W WADLEY AVE.

MIDLAND, TX 79705

RE: AVALON UT 643 - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 04/03/25 13:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/03/2025
 Reported: 04/04/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/02/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW 02 0-4' (H251972-01)

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	04/03/2025	ND	1.87	93.6	2.00	1.29	
Toluene*	<0.050	0.050	04/03/2025	ND	1.98	99.2	2.00	2.64	
Ethylbenzene*	<0.050	0.050	04/03/2025	ND	2.02	101	2.00	3.47	
Total Xylenes*	<0.150	0.150	04/03/2025	ND	6.30	105	6.00	2.68	
Total BTEX	<0.300	0.300	04/03/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	64.0	16.0	04/04/2025	ND	432	108	400	3.77		

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	04/03/2025	ND	210	105	200	5.48	
DRO >C10-C28*	<10.0	10.0	04/03/2025	ND	208	104	200	5.86	
EXT DRO >C28-C36	<10.0	10.0	04/03/2025	ND					

Surrogate: 1-Chlorooctane 80.2 % 44.4-145

Surrogate: 1-Chlorooctadecane 73.2 % 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

Notes and Definitions

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

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

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

[illegible]

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



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

April 08, 2025

TRACY HILLARD

ENSOLUM, LLC

705 W WADLEY AVE.

MIDLAND, TX 79705

RE: AVALON UT 643 - SPILLS

Enclosed are the results of analyses for samples received by the laboratory on 04/07/25 11:46.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/07/2025
 Reported: 04/08/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/04/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Shalyn Rodriguez

Sample ID: FS 05 9' (H252034-01)

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	04/07/2025	ND	2.02	101	2.00	18.1	
Toluene*	<0.050	0.050	04/07/2025	ND	1.96	97.9	2.00	19.2	
Ethylbenzene*	<0.050	0.050	04/07/2025	ND	2.03	101	2.00	19.1	
Total Xylenes*	<0.150	0.150	04/07/2025	ND	6.34	106	6.00	19.2	
Total BTX	<0.300	0.300	04/07/2025	ND					

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1020	16.0	04/07/2025	ND	432	108	400	3.77		

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	04/08/2025	ND	197	98.6	200	0.709	
DRO >C10-C28*	<10.0	10.0	04/08/2025	ND	207	103	200	0.0271	
EXT DRO >C28-C36	<10.0	10.0	04/08/2025	ND					

Surrogate: 1-Chlorooctane 94.7 % 44.4-145

Surrogate: 1-Chlorooctadecane 90.0 % 40.6-153

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/07/2025
 Reported: 04/08/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/04/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Shalyn Rodriguez

Sample ID: FS 11 8' (H252034-02)

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	04/07/2025	ND	2.02	101	2.00	18.1		
Toluene*	<0.050	0.050	04/07/2025	ND	1.96	97.9	2.00	19.2		
Ethylbenzene*	<0.050	0.050	04/07/2025	ND	2.03	101	2.00	19.1		
Total Xylenes*	<0.150	0.150	04/07/2025	ND	6.34	106	6.00	19.2		
Total BTEx	<0.300	0.300	04/07/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 108 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	624	16.0	04/07/2025	ND	432	108	400	3.77	

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	04/08/2025	ND	197	98.6	200	0.709	
DRO >C10-C28*	<10.0	10.0	04/08/2025	ND	207	103	200	0.0271	
EXT DRO >C28-C36	<10.0	10.0	04/08/2025	ND					

Surrogate: 1-Chlorooctane 92.1 % 44.4-145

Surrogate: 1-Chlorooctadecane 85.9 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/07/2025
 Reported: 04/08/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/04/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Shalyn Rodriguez

Sample ID: SW 07 4-8' (H252034-03)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/07/2025	ND	2.02	101	2.00	18.1		
Toluene*	<0.050	0.050	04/07/2025	ND	1.96	97.9	2.00	19.2		
Ethylbenzene*	<0.050	0.050	04/07/2025	ND	2.03	101	2.00	19.1		
Total Xylenes*	<0.150	0.150	04/07/2025	ND	6.34	106	6.00	19.2		
Total BTEx	<0.300	0.300	04/07/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 102 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	944	16.0	04/07/2025	ND	432	108	400	3.77		

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	04/08/2025	ND	197	98.6	200	0.709	
DRO >C10-C28*	<10.0	10.0	04/08/2025	ND	207	103	200	0.0271	
EXT DRO >C28-C36	<10.0	10.0	04/08/2025	ND					

Surrogate: 1-Chlorooctane 91.2 % 44.4-145

Surrogate: 1-Chlorooctadecane 84.6 % 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, LLC
 TRACY HILLARD
 705 W WADLEY AVE.
 MIDLAND TX, 79705
 Fax To:

Received: 04/07/2025
 Reported: 04/08/2025
 Project Name: AVALON UT 643 - SPILLS
 Project Number: 03C1558598
 Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/04/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Shalyn Rodriguez

Sample ID: SW 11 4-8' (H252034-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/07/2025	ND	2.02	101	2.00	18.1		
Toluene*	<0.050	0.050	04/07/2025	ND	1.96	97.9	2.00	19.2		
Ethylbenzene*	<0.050	0.050	04/07/2025	ND	2.03	101	2.00	19.1		
Total Xylenes*	<0.150	0.150	04/07/2025	ND	6.34	106	6.00	19.2		
Total BTEX	<0.300	0.300	04/07/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 108 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	240	16.0	04/07/2025	ND	432	108	400	3.77		

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	04/08/2025	ND	197	98.6	200	0.709	
DRO >C10-C28*	<10.0	10.0	04/08/2025	ND	207	103	200	0.0271	
EXT DRO >C28-C36	<10.0	10.0	04/08/2025	ND					

Surrogate: 1-Chlorooctane 90.3 % 44.4-145

Surrogate: 1-Chlorooctadecane 83.1 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

QR-04	The RPD for the BS/BSD was outside of historical limits.
BS-3	Blank spike recovery outside of lab established statistical limits, but still within method limits. Data is not adversely affected.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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

Celey D. Keene, Lab Director/Quality Manager

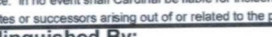
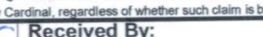
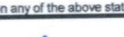


101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]

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Relinquished By: 		Date: 4-7-25 Time: 1440		Received By: 		Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:			
Relinquished By:		Date:		Received By:		All Results are emailed. Please provide Email address: JReich@ensolum.com BBelill@ensolum.com, TMorrissey@ensolum.com, THillard@ensolum.com, KThomason@ensolum.com Jdorman@ensolum.com			
Relinquished By:		Date:		Received By:		REMARKS: Incident Number: nAPP2501451404 Cost Center: 1136201001 GFCM: 48605000			
Delivered By: (Circle One)		Observed Temp. °C 2.40		Sample Condition Cool Intact <input checked="" type="checkbox"/>		CHECKED BY: (Initials) 		Turnaround Time: 1440 to 3:24 hr	
Sampler - UPS - Bus - Other:		Corrected Temp. °C 2.90		Cool Intact <input type="checkbox"/> Yes <input type="checkbox"/> No		Thermometer ID #1132 Correction Factor 0.5°C		Standard <input checked="" type="checkbox"/> Bacteria (only) Sample Condition Cool Intact <input type="checkbox"/> Yes <input type="checkbox"/> No Observed Temp. °C	
								Corrected Temp. °C	

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



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

April 14, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 04/11/25 15:09.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is 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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: FS 05 9 (H252176-01)

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	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTEx	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.7 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	384	16.0	04/14/2025	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	04/11/2025	ND	185	92.4	200	3.43	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	183	91.4	200	2.16	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 94.4 % 44.4-145

Surrogate: 1-Chlorooctadecane 101 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: SW 07 4-8 (H252176-02)

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	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTEX	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.9 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	400	16.0	04/14/2025	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	04/11/2025	ND	185	92.4	200	3.43	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	183	91.4	200	2.16	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 89.0 % 44.4-145

Surrogate: 1-Chlorooctadecane 93.8 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: FS 12 8 (H252176-03)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/11/2025	ND	2.18	109	2.00	1.58	
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50	
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44	
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40	
Total BTEx	<0.300	0.300	04/11/2025	ND					

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

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	112	16.0	04/14/2025	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	04/11/2025	ND	185	92.4	200	3.43	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	183	91.4	200	2.16	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 94.1 % 44.4-145

Surrogate: 1-Chlorooctadecane 99.8 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: FS 13 8 (H252176-04)

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	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTX	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.3 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	128	16.0	04/14/2025	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	04/11/2025	ND	185	92.4	200	3.43	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	183	91.4	200	2.16	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 82.9 % 44.4-145

Surrogate: 1-Chlorooctadecane 86.6 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: FS 14 8 (H252176-05)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTEx	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.6 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	96.0	16.0	04/14/2025	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	04/11/2025	ND	205	102	200	2.07	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	200	100	200	3.35	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 108 % 44.4-145

Surrogate: 1-Chlorooctadecane 103 % 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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: SW 06 4-8 (H252176-06)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTEX	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.4 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: CT						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	144	16.0	04/14/2025	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	04/11/2025	ND	205	102	200	2.07	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	200	100	200	3.35	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 90.2 % 44.4-145

Surrogate: 1-Chlorooctadecane 85.8 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: FS 15 7 (H252176-07)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	04/11/2025	ND	2.18	109	2.00	1.58		
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50		
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44		
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40		
Total BTEx	<0.300	0.300	04/11/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.5 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: KV						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	176	16.0	04/14/2025	ND	432	108	400	3.77		

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	04/11/2025	ND	205	102	200	2.07	
DRO >C10-C28*	<10.0	10.0	04/11/2025	ND	200	100	200	3.35	
EXT DRO >C28-C36	<10.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 107 % 44.4-145

Surrogate: 1-Chlorooctadecane 104 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 04/11/2025
Reported: 04/14/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.20165, -103.77801

Sampling Date: 04/11/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Alyssa Parras

Sample ID: SW 12 0-4 (H252176-08)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/11/2025	ND	2.18	109	2.00	1.58	
Toluene*	<0.050	0.050	04/11/2025	ND	2.21	110	2.00	1.50	
Ethylbenzene*	<0.050	0.050	04/11/2025	ND	2.15	107	2.00	1.44	
Total Xylenes*	<0.150	0.150	04/11/2025	ND	6.30	105	6.00	1.40	
Total BTEX	<0.300	0.300	04/11/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.9 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: KV					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	144	16.0	04/14/2025	ND	432	108	400	3.77	

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	04/11/2025	ND	205	102	200	2.07	
DRO >C10-C28*	77.0	10.0	04/11/2025	ND	200	100	200	3.35	
EXT DRO >C28-C36	11.0	10.0	04/11/2025	ND					

Surrogate: 1-Chlorooctane 92.9 % 44.4-145

Surrogate: 1-Chlorooctadecane 88.3 % 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 black ink, appearing to read "Celey D. Keene", is written over a horizontal line.

Celey D. Keene, Lab Director/Quality Manager



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

September 11, 2025

TRACY HILLARD

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 09/10/25 13:15.

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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 09/10/2025
Reported: 09/11/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523-104.207194

Sampling Date: 09/10/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SW01 0-4' (H255674-01)

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	09/10/2025	ND	1.95	97.6	2.00	0.930		
Toluene*	<0.050	0.050	09/10/2025	ND	1.91	95.7	2.00	1.06		
Ethylbenzene*	<0.050	0.050	09/10/2025	ND	1.92	95.9	2.00	1.55		
Total Xylenes*	<0.150	0.150	09/10/2025	ND	5.85	97.6	6.00	1.69		
Total BTEx	<0.300	0.300	09/10/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 111 % 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	368	16.0	09/11/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/11/2025	ND	191	95.7	200	1.44	
DRO >C10-C28*	<10.0	10.0	09/11/2025	ND	194	97.0	200	1.68	
EXT DRO >C28-C36	<10.0	10.0	09/11/2025	ND					

Surrogate: 1-Chlorooctane 76.8 % 44.4-145

Surrogate: 1-Chlorooctadecane 75.6 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

ENSOLUM
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 09/10/2025
Reported: 09/11/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523-104.207194

Sampling Date: 09/10/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SW03 0-4' (H255674-02)

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	09/10/2025	ND	1.95	97.6	2.00	0.930	
Toluene*	<0.050	0.050	09/10/2025	ND	1.91	95.7	2.00	1.06	
Ethylbenzene*	<0.050	0.050	09/10/2025	ND	1.92	95.9	2.00	1.55	
Total Xylenes*	<0.150	0.150	09/10/2025	ND	5.85	97.6	6.00	1.69	
Total BTX	<0.300	0.300	09/10/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 111 % 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	320	16.0	09/11/2025	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/11/2025	ND	191	95.7	200	1.44	
DRO >C10-C28*	<10.0	10.0	09/11/2025	ND	194	97.0	200	1.68	
EXT DRO >C28-C36	<10.0	10.0	09/11/2025	ND					

Surrogate: 1-Chlorooctane 72.8 % 44.4-145

Surrogate: 1-Chlorooctadecane 71.7 % 40.6-153

Cardinal Laboratories

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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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 09/10/2025
Reported: 09/11/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523-104.207194

Sampling Date: 09/10/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: SW13 0-4' (H255674-03)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	09/10/2025	ND	1.95	97.6	2.00	0.930		
Toluene*	<0.050	0.050	09/10/2025	ND	1.91	95.7	2.00	1.06		
Ethylbenzene*	<0.050	0.050	09/10/2025	ND	1.92	95.9	2.00	1.55		
Total Xylenes*	<0.150	0.150	09/10/2025	ND	5.85	97.6	6.00	1.69		
Total BTEX	<0.300	0.300	09/10/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 112 % 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	208	16.0	09/11/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/11/2025	ND	191	95.7	200	1.44	
DRO >C10-C28*	<10.0	10.0	09/11/2025	ND	194	97.0	200	1.68	
EXT DRO >C28-C36	<10.0	10.0	09/11/2025	ND					

Surrogate: 1-Chlorooctane 84.4 % 44.4-145

Surrogate: 1-Chlorooctadecane 84.2 % 40.6-153

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*=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
TRACY HILLARD
3122 NATIONAL PARKS HWY
CARLSBAD NM, 88220
Fax To:

Received: 09/10/2025
Reported: 09/11/2025
Project Name: AVALON UT 643
Project Number: 03C1558598
Project Location: XTO 32.535523-104.207194

Sampling Date: 09/10/2025
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: FS16 4' (H255674-04)

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	09/10/2025	ND	1.95	97.6	2.00	0.930		
Toluene*	<0.050	0.050	09/10/2025	ND	1.91	95.7	2.00	1.06		
Ethylbenzene*	<0.050	0.050	09/10/2025	ND	1.92	95.9	2.00	1.55		
Total Xylenes*	<0.150	0.150	09/10/2025	ND	5.85	97.6	6.00	1.69		
Total BTX	<0.300	0.300	09/10/2025	ND						

Surrogate: 4-Bromofluorobenzene (PID) 115 % 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	752	16.0	09/11/2025	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/11/2025	ND	199	99.4	200	0.693	
DRO >C10-C28*	192	10.0	09/11/2025	ND	200	100	200	0.163	
EXT DRO >C28-C36	155	10.0	09/11/2025	ND					

Surrogate: 1-Chlorooctane 90.8 % 44.4-145

Surrogate: 1-Chlorooctadecane 92.6 % 40.6-153

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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

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A handwritten signature in black ink, appearing to read "Caley D. Keene", is written over a horizontal line.

Caley 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				BILL TO				ANALYSIS REQUEST											
Project Manager: Tracy Hillard				P.O. #:															
Address: 3122 National Parks Hwy				Company: XTO Energy Inc															
City: Carlsbad State: NM Zip: 88220				Attn: ^{JDB} Cotton Brown ^{Ashley} McAfee															
Phone #: 575 937 3906 Fax #:				Address: 3104 E Green St															
Project #: 0301556598 Project Owner: XTO				City: Carlsbad															
Project Name: Avalon UT 643				State: NM Zip: 88220															
Project Location: 32.535523, -104.207194				Phone #:															
Sampler Name: Joshua Boxley				Fax #:															
FOR LAB USE ONLY																			
Lab I.D.	Sample I.D.	Depth (feet)	(GRAB OR (C)OMP. # CONTAINERS	MATRIX				PRESERV.	SAMPLING		Chlorides	TPH	BTEX						
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	ACID/BASE								ICE/COOL	OTHER
Hassler																			
1	SW01	0-4	C 1			X				X			9.10.25	0750	X	X	X		
2	SW03	0-4	C 1			X				X			↓	0715	X	X	X		
3	SW13	0-4	C 1			X				X			↓	0820	X	X	X		
4	FS16	4	C 1			X				X			9.10.25	0815	X	X	X		
JDB																			

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Relinquished By:	Date: 9.10.25 Time: 13:15	Received By:	Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:
Relinquished By:	Date:	Received By:	All Results are emailed. Please provide Email address: jboxley@ensolum.com THillard @ensolum.com, TMorrissey@ensolum.com, KThomason@ensolum.com
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Observed Temp. °C: 2.8 Corrected Temp. °C: 3.1	Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Yes <input type="checkbox"/> No <input type="checkbox"/> No	REMARKS: Incident: wAPP 250145404 API: 30-015-24495 Cost Center: 1136201001 GFCM: 48605000 - Spills
		CHECKED BY: (Initials)	Turnaround Time: 24 hr <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush Thermometer ID: #140 Correction Factor: 10.30
			Bacteria (only) Sample Condition Cool Intact <input type="checkbox"/> Yes <input type="checkbox"/> No Observed Temp. °C Corrected Temp. °C

FORM-006 R 3.2 10/07/21

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



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

September 26, 2025

AIMEE COLE

ENSOLUM

3122 NATIONAL PARKS HWY

CARLSBAD, NM 88220

RE: AVALON UT 643

Enclosed are the results of analyses for samples received by the laboratory on 09/25/25 13:55.

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 "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

ENSOLUM
 AIMEE COLE
 3122 NATIONAL PARKS HWY
 CARLSBAD NM, 88220
 Fax To:

Received: 09/25/2025
 Reported: 09/26/2025
 Project Name: AVALON UT 643
 Project Number: 03C1558598
 Project Location: XTO 32.535523-104.207194

Sampling Date: 09/24/2025
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Shalyn Rodriguez

Sample ID: BF 01 0.2 (H255994-01)

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	09/25/2025	ND	1.94	97.2	2.00	0.244	
Toluene*	<0.050	0.050	09/25/2025	ND	1.92	95.9	2.00	0.121	
Ethylbenzene*	<0.050	0.050	09/25/2025	ND	1.87	93.3	2.00	0.130	
Total Xylenes*	<0.150	0.150	09/25/2025	ND	5.46	90.9	6.00	0.0202	
Total BTEX	<0.300	0.300	09/25/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID) 88.3 % 70.4-141

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	09/26/2025	ND	400	100	400	3.92	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/25/2025	ND	218	109	200	5.28	
DRO >C10-C28*	<10.0	10.0	09/25/2025	ND	234	117	200	11.0	
EXT DRO >C28-C36	<10.0	10.0	09/25/2025	ND					

Surrogate: 1-Chlorooctane 94.4 % 52.4-130

Surrogate: 1-Chlorooctadecane 96.7 % 39.9-141

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

QR-04	The RPD for the BS/BSD was outside of historical limits.
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 black ink, appearing to read "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager


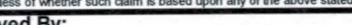



101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Ensolum, LLC Project Manager: Aimee Cole Address: 3122 National Parks Hwy. City: Carlsbad State: NM Zip: 88220 Phone #: 844-500-7775 Fax #: Project #: nAPP2501451404 Project Owner: XTO Energy Project Name: Avalon UT 643 Project Location: 32.535523, -104.207194 Sampler Name: Bowan Simmons										BILL TO P.O. #: Company: XTO Energy Attn: Robert Woodall Address: 3104 E. Green St. City: Carlsbad State: NM Zip: 88220 Phone #: Fax #:					ANALYSIS REQUEST									
FOR LAB USE ONLY Lab I.D. Sample I.D. Sample Depth (feet) GRAB OR (C)OMP. # CONTAINERS MATRIX GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER: PRESERV ACID/BASE: ICE / COOL OTHER: SAMPLING DATE TIME										CHLORIDE BTEX TPH														
HASS994 1 BF01 0.2 C 1 SOIL BS 9/24/25 14:31										[Grid for Analysis Results]														

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Relinquished By: 		Date: 9-25-25		Received By: 		Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:	
		Time: 1355				All Results are emailed. Please provide Email address:	
Relinquished By:		Date:		Received By:		ACole@ensolum.com, TMorrissey@ensolum.com, HGreen@ensolum.com	
		Time:				REMARKS:	
						Cost Center: 1136201001 GFCM: 48605000	
Delivered By: (Circle One)		Observed Temp. °C 0.4		Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		CHECKED BY:  (Initials)	
Sampler - UPS - Bus - Other:		Corrected Temp. °C 0.7		<input type="checkbox"/> Yes <input type="checkbox"/> No		Turnaround Time: 24 HR. Standard Rush <input checked="" type="checkbox"/>	
						Thermometer ID #113 Correction Factor -0.5°C	
						Bacteria (only) Sample Condition Cool Intact Observed Temp. °C	
						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No Corrected Temp. °C	



Appendix G

Spill Calculation

Location:	Avalon UT 643	
Spill Date:	1/13/2024	
Area 1		
Approximate Area =	2005.00	sq. ft.
Average Saturation (or depth) of spill =	3.00	inches
Average Porosity Factor =	0.10	
VOLUME OF LEAK		
Total Crude Oil =	1.00	bbls
Total Produced Water =	10.00	bbls
TOTAL VOLUME OF LEAK		
Total Crude Oil =	1.00	bbls
Total Produced Water =	10.00	bbls
TOTAL VOLUME RECOVERED		
Total Crude Oil =	0.00	bbls
Total Produced Water =	1.00	bbls

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

QUESTIONS

Action 421789

QUESTIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 421789
	Action Type: [C-141] Initial C-141 (C-141-v-Initial)

QUESTIONS

Prerequisites	
Incident ID (n#)	nAPP2501451404
Incident Name	NAPP2501451404 AVALON UT 643 @ 0
Incident Type	Release Other
Incident Status	Initial C-141 Received

Location of Release Source*Please answer all the questions in this group.*

Site Name	Avalon UT 643
Date Release Discovered	01/13/2025
Surface Owner	State

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: Equipment Failure Well Crude Oil Released: 1 BBL Recovered: 0 BBL Lost: 1 BBL.
Produced Water Released (bbls) Details	Cause: Equipment Failure Well Produced Water Released: 10 BBL Recovered: 1 BBL Lost: 9 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
Condensate Released (bbls) Details	Not answered.
Natural Gas Vented (Mcf) Details	Not answered.
Natural Gas Flared (Mcf) Details	Not answered.
Other Released Details	Not answered.
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	Not answered.

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

QUESTIONS, Page 2

Action 421789

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 421789
	Action Type: [C-141] Initial C-141 (C-141-v-Initial)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	No, according to supplied volumes this does not appear to be a "gas only" report.
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	No
Reasons why this would be considered a submission for a notification of a major release	Unavailable.
With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.	

Initial Response

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

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

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

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

I hereby agree and sign off to the above statement	Name: Ashley McAfee Email: ashley.a.mcafee@exxonmobil.com Date: 01/16/2025
--	--

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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, Page 3

Action 421789

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 421789
	Action Type: [C-141] Initial C-141 (C-141-v-Initial)

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)	Not answered.
What method was used to determine the depth to ground water	Not answered.
Did this release impact groundwater or surface water	Not answered.
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	Not answered.
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Not answered.
An occupied permanent residence, school, hospital, institution, or church	Not answered.
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Not answered.
Any other fresh water well or spring	Not answered.
Incorporated municipal boundaries or a defined municipal fresh water well field	Not answered.
A wetland	Not answered.
A subsurface mine	Not answered.
An (non-karst) unstable area	Not answered.
Categorize the risk of this well / site being in a karst geology	Not answered.
A 100-year floodplain	Not answered.
Did the release impact areas not on an exploration, development, production, or storage site	Not answered.

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	No
<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>	

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

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

CONDITIONS

Action 421789

CONDITIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 421789
	Action Type: [C-141] Initial C-141 (C-141-v-Initial)

CONDITIONS

Created By	Condition	Condition Date
nvez	None	1/17/2025

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

QUESTIONS

Action 514808

QUESTIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Prerequisites	
Incident ID (n#)	nAPP2501451404
Incident Name	NAPP2501451404 AVALON UT 643 @ D-32-20S-28E
Incident Type	Release Other
Incident Status	Reclamation Report Received

Location of Release Source

Please answer all the questions in this group.

Site Name	AVALON UT 643
Date Release Discovered	01/13/2025
Surface Owner	State

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: Equipment Failure Well Crude Oil Released: 1 BBL Recovered: 0 BBL Lost: 1 BBL.
Produced Water Released (bbls) Details	Cause: Equipment Failure Well Produced Water Released: 10 BBL Recovered: 1 BBL Lost: 9 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
Condensate Released (bbls) Details	Not answered.
Natural Gas Vented (Mcf) Details	Not answered.
Natural Gas Flared (Mcf) Details	Not answered.
Other Released Details	Not answered.
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	Not answered.

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QUESTIONS, Page 2

Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	No, according to supplied volumes this does not appear to be a "gas only" report.
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	No
Reasons why this would be considered a submission for a notification of a major release	Unavailable.
With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.	

Initial Response

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

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

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

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

I hereby agree and sign off to the above statement	Name: Richard Kotzur Title: Senior Project Manager Email: NMEnvNotifications@exxonmobil.com Date: 10/13/2025
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QUESTIONS, Page 3

Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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 1000 (ft.) and ½ (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 1 and 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Between ½ and 1 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between ½ and 1 (mi.)
Any other fresh water well or spring	Between ½ and 1 (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 1000 (ft.) and ½ (mi.)
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	High
A 100-year floodplain	Between 1 and 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan	
<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)	752
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	350
GRO+DRO (EPA SW-846 Method 8015M)	195
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
<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	01/21/2025
On what date will (or did) the final sampling or liner inspection occur	09/24/2025
On what date will (or was) the remediation complete(d)	09/24/2025
What is the estimated surface area (in square feet) that will be reclaimed	2800
What is the estimated volume (in cubic yards) that will be reclaimed	800
What is the estimated surface area (in square feet) that will be remediated	2800
What is the estimated volume (in cubic yards) that will be remediated	800
<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, Page 4

Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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	fEEM0112334510 HALFWAY DISPOSAL AND LANDFILL
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: Richard Kotzur Title: Senior Project Manager Email: NMEnvNotifications@exxonmobil.com Date: 10/13/2025
<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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QUESTIONS, Page 5

Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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	No

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Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	507241
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	09/26/2025
What was the (estimated) number of samples that were to be gathered	2
What was the sampling surface area in square feet	400

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	Yes
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
All areas reasonably needed for production or subsequent drilling operations have been stabilized, returned to the sites existing grade, and have a soil cover that prevents ponding of water, minimizing dust and erosion	Yes
What was the total surface area (in square feet) remediated	2800
What was the total volume (cubic yards) remediated	800
All areas not reasonably needed for production or subsequent drilling operations have been reclaimed to contain a minimum of four feet of non-waste contain earthen material with concentrations less than 600 mg/kg chlorides, 100 mg/kg TPH, 50 mg/kg BTEX, and 10 mg/kg Benzene	Yes
What was the total surface area (in square feet) reclaimed	2800
What was the total volume (in cubic yards) reclaimed	800
Summarize any additional remediation activities not included by answers (above)	Site assessment, delineation and excavation activities were conducted at the Site to address the January 13, 2025, produced water and crude oil release. Laboratory analytical results for all confirmation soil samples collected from the final excavation extent indicated that all COC concentrations were compliant with the Closure Criteria. Based on the soil sample analytical results, no further remediation was required. The excavation was backfilled with material purchased locally and the Site recontoured to match pre-existing Site conditions. Excavation of soil has mitigated impacts at this Site. XTO believes these remedial actions are protective of human health, the environment, and groundwater. As such, XTO respectfully requests closure for Incident Number nAPP2501451404.

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

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

I hereby agree and sign off to the above statement	Name: Richard Kotzur Title: Senior Project Manager Email: NMEnvNotifications@exxonmobil.com Date: 10/13/2025
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Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Reclamation Report	
<i>Only answer the questions in this group if all reclamation steps have been completed.</i>	
Requesting a reclamation approval with this submission	Yes
What was the total reclamation surface area (in square feet) for this site	2800
What was the total volume of replacement material (in cubic yards) for this site	800
<i>Per Paragraph (1) of Subsection D of 19.15.29.13 NMAC the reclamation must contain a minimum of four feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0, or other test methods approved by the division. The soil cover must include a top layer, which is either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.</i>	
Is the soil top layer complete and is it suitable material to establish vegetation	Yes
On what (estimated) date will (or was) the reseeding commence(d)	04/10/2026
Summarize any additional reclamation activities not included by answers (above)	The SLO loamy seed mix will be applied via drill seeding or broadcast seeding. If broadcast seeding is selected, the PLS/acre will be doubled and the seed will be raked in by chaining or dragging the Site. Reclamation activities will be documented via on-site monitoring and photographs will be included in a Re-Vegetation Report.
<i>The responsible party must attach information demonstrating they have complied with all applicable reclamation requirements and any conditions or directives of the OCD. This demonstration should be in the form of attachments (in .pdf format) including a scaled site map, any proposed reseeding plans or relevant field notes, photographs of reclaimed area, and a narrative of the reclamation activities. Refer to 19.15.29.13 NMAC.</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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.	
I hereby agree and sign off to the above statement	Name: Richard Kotzur Title: Senior Project Manager Email: NMEnvNotifications@exxonmobil.com Date: 10/13/2025

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QUESTIONS, Page 8

Action 514808

QUESTIONS (continued)

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Revegetation Report	
Only answer the questions in this group if all surface restoration, reclamation and re-vegetation obligations have been satisfied.	
Requesting a restoration complete approval with this submission	No
Per Paragraph (4) of Subsection (D) of 19.15.29.13 NMAC for any major or minor release containing liquids, the responsible party must notify the division when reclamation and re-vegetation are complete.	

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CONDITIONS

Action 514808

CONDITIONS

Operator: XTO ENERGY, INC 6401 Holiday Hill Road Midland, TX 79707	OGRID: 5380
	Action Number: 514808
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

CONDITIONS

Created By	Condition	Condition Date
nvez	Remediation closure and reclamation report approved. Release resolved. Pending re-vegetation report.	12/9/2025