ENSOLUM

CLOSURE REPORT

Property:

Grama Ridge Release
S5, T22S, R34E
Lea County, New Mexico
NMOCD No. 1RP-5715

November 14, 2019
Ensolum Project No. 03B1206009

Prepared for:

Marathon Oil Permian LLC
4111 S. Tidwell Road
Carlsbad, New Mexico 88220

Attn: Mr. Isaac Castro

Prepared by:

5NE8Y-191115-C-1410 1RP-5715

Beaux Jennings
Senior Project Manager

Elizabeth Scaggs

Elizabeth Scaggs, PG
Principal Geoscientist

ENSOLUM

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ENSOLUM

CLOSURE REPORT

Grama Ridge Release
S5, T22S, R34E
Lea County, New Mexico
NMOCD No. 1RP-5715

1.0 INTRODUCTION

1.1 Site Description & Background

Operator:	Marathon Oil Permian LLC (Marathon)
Site Name:	Grama Ridge
Location:	32.399529 N, -103.489403 W Section 5, Township 22 South, Range 34 East Lea County, New Mexico
Property:	Marathon Oil Permian LLC
Regulatory:	New Mexico Energy, Minerals and Natural Resources Department (EMNRD) Oil Conservation Division (OCD)

On September 5, 2019, a Marathon operator observed and reported a release of crude oil from a leaking lease automatic custody transfer (LACT) unit air eliminator. Approximately 12.5 barrels (bbls) of crude oil was released onto the ground surface and flowed approximately 100 feet west and 80 feet north of the LACT unit. Subsequent to the discovery of the release, Marathon dispatched a vacuum truck to recover standing crude oil that was released onto the pad surrounding the LACT unit. Approximately 10 bbls of crude oil were recovered the vacuum truck.

The **Topographic Map** depicting the location of the Site is included as **Figure 1**, and the **Site Vicinity Map** is included as **Figure 2** in **Appendix A**.

1.2 Project Objective

The primary objective of the closure activities was to reduce constituent of concern (COC) concentrations in the on-Site soils to below the applicable New Mexico EMNRD OCD closure criteria concentrations.

2.0 CLOSURE CRITERIA

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. In order to address activities related to exempt oil and gas releases, the New Mexico EMNRD OCD references New Mexico Administrative Code (NMAC) 19.15.29 *Releases,* which establishes investigation and abatement action requirements for sites subject to reporting and/or corrective action. Ensolum, LLC (Ensolum) utilized information provided by Marathon, the general site characteristics, and information available from the New Mexico Office of the State Engineer (OSE) and the New Mexico EMNRD OCD Imaging database to determine the appropriate closure criteria for the Site. Supporting documentation and figures associated with the following bullets are provided in **Appendix B**. No water wells were identified within a half-mile of the Site. However, the closest water well was identified approximately 0.88 miles northeast of the Site on the OSE Water Rights Reporting System (WRRS) database with a depth to water of 31 feet below ground surface (bgs).

- The Site is not located within 300 feet of a New Mexico ENMRD OCD-defined continuously flowing watercourse or significant watercourse.
- The Site is not located within 200 feet of a lakebed, sinkhole or playa lake.
- The Site is not located within 300 feet from a permanent residence, school, hospital, institution or church.
- According to the OSE WRSS database there are no private, domestic freshwater wells used by less than five (5) households for domestic or stock water purposes identified within 500 feet of the Site.
- According to the OSE WRSS database there are no freshwater wells identified within 1,000 feet of the Site as declared in the previous bullet.
- The Site is not located within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3.
- The Site is not located within 300 feet of a wetland.
- Based on information identified on the New Mexico Mining and Minerals Division's GIS, Maps and Mine Data database, the Site is not located within an area overlying a subsurface mine.
- The Site is not located within an unstable area.
- The Site is not located within a 100-year floodplain.

Based on the identified siting criteria, cleanup goals for soils remaining in place at the Site include:

Closure Criteria for Soils Impacted by a Release			
Minimum depth below any point within horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	Constituent	Method	Limit
≤50 feet	Chloride	EPA 300.0 or SM4500 Cl B	600 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015M	100 mg/kg
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	10 mg/kg

3.0 SOIL REMEDIATION ACTIVITIES

On September 5, 2019, a Marathon operator observed and reported a release of crude oil from a leaking LACT unit air eliminator. Approximately 12.5 bbls of crude oil was released onto the ground surface and flowed approximately 100 feet west and 80 feet north of the LACT unit. Subsequent to the discovery of the release, Marathon dispatched a vacuum truck to recover standing crude oil that was released onto the pad surrounding the LACT unit. Approximately 10 bbls of crude oil were recovered the vacuum truck. During remediation activities, Lighthouse Environmental, LLC (Lighthouse) utilized a backhoe and hand digging during soil remediation activities, beginning near the point of release near the LACT unit and flow path. Remediation activities were conducted by Lighthouse, with oversight by Ensolum, on October 2, 2019 through October 4, 2019.

The flow path area measured approximately 4,800 square feet. The maximum depth of COC impacts measured approximately two and a half feet (2.5) bgs.

The lithology encountered during the completion of closure activities consisted primarily of caliche, underlain by silty sand.

A total of approximately 270 cubic yards (cy) of petroleum hydrocarbon affected soils were transported off-site for disposal. The excavation was backfilled with imported clean fill then contoured to surrounding grade.

Figure 3 is a map that identifies approximate soil sample locations and depicts the approximate dimensions of the excavation with respect to the LACT unit (**Appendix A**). Photographic documentation of the field activities is included in **Appendix C**.

4.0 SOIL SAMPLING PROGRAM

Ensolum's soil sampling program included the collection of five (5) confirmation soil samples (CS-1 through CS-5) from the impacted area for laboratory analysis. The location and depth of the five (5) confirmation soil samples were taken within the flow path to horizontally and vertically delineate the crude oil released from the on-site LACT unit. Prior to Ensolum's arrival, a portion of the impacted soil had been removed and placed on a plastic liner on the northwest portion of the site. A stockpile soil sample (STP) was also taken to characterize the impacted soil for disposal purposes.

The soil samples were collected and placed in laboratory prepared glassware, labeled/sealed using laboratory supplied labels and custody seals, and stored on ice in a cooler. The samples were relinquished to Xenco Laboratories in Midland, Texas, under proper chain-of-custody procedures.

5.0 SOIL LABORATORY ANALYTICAL METHODS

The confirmation soil samples and stockpile soil sample were analyzed for benzene, toluene, ethylbenzene and total xylenes (BTEX) using Environmental Protection Agency (EPA) SW-846 Method #8021B, total petroleum hydrocarbon (TPH) gasoline range organics (GRO), diesel range organics (DRO), and motor oil/lube oil range organics (MRO) using EPA SW-846 Method #8015M, and chloride using EPA Method #300.0.

Laboratory analytical results are summarized in **Table 1** in **Appendix D**. The executed chain-of-custody and laboratory documentation are provided in **Appendix E**.

6.0 DATA EVALUATION

Ensolum compared the BTEX, TPH GRO/DRO/MRO, and chloride concentrations associated with the confirmation soil samples (CS-1 through CS-5) remaining in place to the New Mexico EMNRD OCD closure criteria.

- Laboratory analytical results indicate benzene concentrations for soils remaining in place do not exceed the laboratory sample detection limits (SDLs) or the New Mexico EMNRD OCD closure criteria of 10 milligrams per kilogram (mg/kg).
- Laboratory analytical results indicate that total BTEX concentrations for soils remaining in place do not exceed the laboratory SDLs or the New Mexico EMNRD OCD closure criteria of 50 mg/kg.
- Laboratory analytical results indicate combined TPH GRO/DRO/MRO concentrations for soils remaining in place do not exceed the laboratory SDLs or the New Mexico EMNRD OCD closure criteria of 100 mg/kg.
- Laboratory analytical results indicate chloride concentrations for soils remaining in place do not exceed the laboratory SDLs or the New Mexico EMNRD OCD closure criteria of 600 mg/kg.

Laboratory analytical results are summarized in **Table 1** in **Appendix D.**

7.0 RECLAMATION AND RE-VEGETATION

The impacted area was backfilled with clean backfill and then contoured to original surface grade. The release area is located inside an active oil and gas production and storage facility; therefore, Lighthouse compacted the backfilled excavation in order to minimize dust and erosion at the site.

8.0 FINDINGS AND RECOMMENDATION

- The primary objective of the closure activities was to reduce COC concentrations in the on-Site soils to below the applicable New Mexico EMNRD OCD closure criteria using the New Mexico EMNRD OCD's NMAC 19.15.29 *Releases* as guidance.
- During remediation activities, Lighthouse utilized a backhoe and hand digging during soil remediation activities, beginning near the point of release near the LACT unit and flow path. Remediation activities were conducted by Lighthouse, with oversight by Ensolum, on October 2, 2019 through October 4, 2019.
- A total of five (5) confirmation soil samples were collected from the impacted area. Based on laboratory analytical results, soils remaining in place do not exhibit COC concentrations above the applicable New Mexico EMNRD OCD closure criteria.
- The location and depth of the five (5) confirmation soil samples taken within the flow path are adequate to effectively horizontally and vertically delineate the crude oil released from the on-site LACT unit.
- A total of approximately 270 cy of petroleum hydrocarbon affected soils were transported off-site for disposal. The excavation was backfilled with imported clean fill then contoured to surrounding grade.

  Based on field observations and laboratory analytical results, no additional investigation or corrective action appears warranted at this time.

9.0 STANDARDS OF CARE, LIMITATIONS, AND RELIANCE

9.1 Standard of Care

Ensolum's services were performed in accordance with standards customarily provided by a firm rendering the same or similar services in the area during the same time period. Ensolum makes no warranties, express or implied, as to the services performed hereunder. Additionally, Ensolum does not warrant the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties). This scope of services was performed in accordance with the scope of work agreed with the client, as detailed in our proposal.

9.2 Limitations

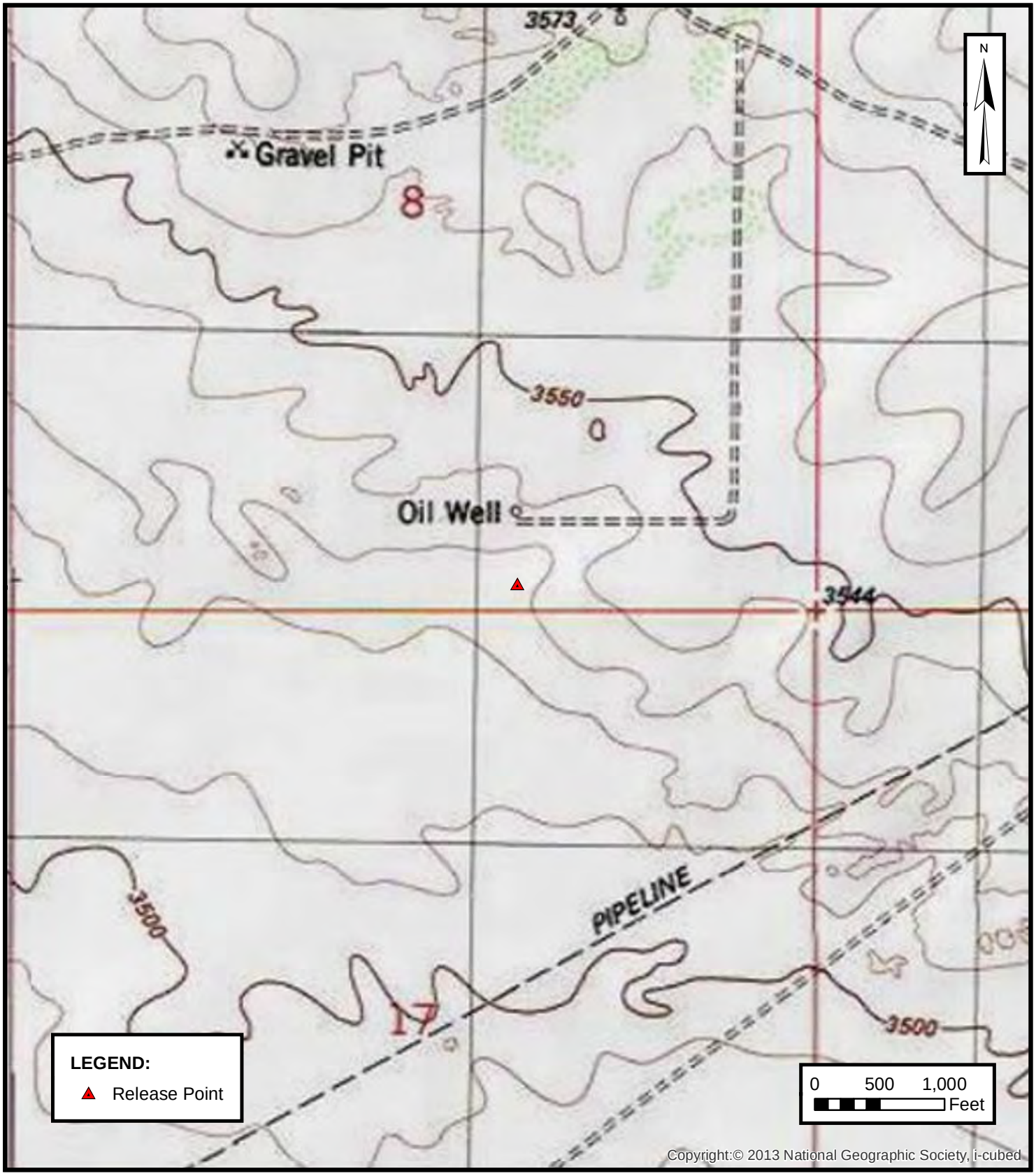
Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work and it should be noted that this information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, or not present during these services, and Ensolum cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during the investigation. Environmental conditions at other areas or portions of the Site may vary from those encountered at actual sample locations. Ensolum's findings, and recommendations are based solely upon data available to Ensolum at the time of these services.

9.3 Reliance

This report has been prepared for the exclusive use of Marathon Oil Permian LLC, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the express written authorization Marathon Oil Permian LLC and Ensolum. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in the Closure Report.

APPENDIX A

Figures



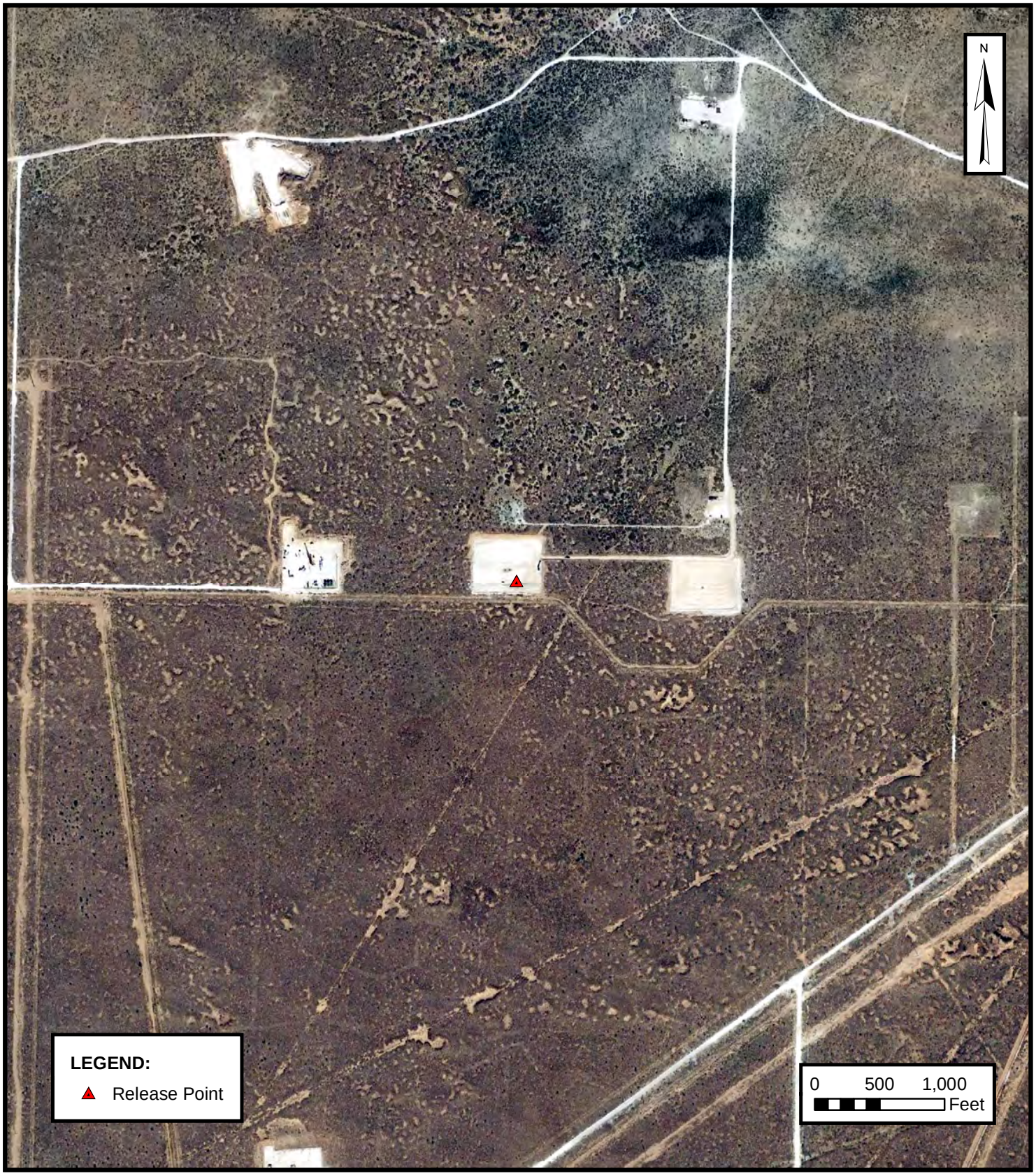
ENSOLUM
Environmental & Hydrogeologic Consultants

TOPOGRAPHIC MAP

MARATHON OIL PERMIAN LLC
GRAMA RIDGE 8 STATE COM #002H
Lea County, New Mexico
32.399529° N, 103.489403° W

PROJECT NUMBER: 03B1206009

FIGURE
1



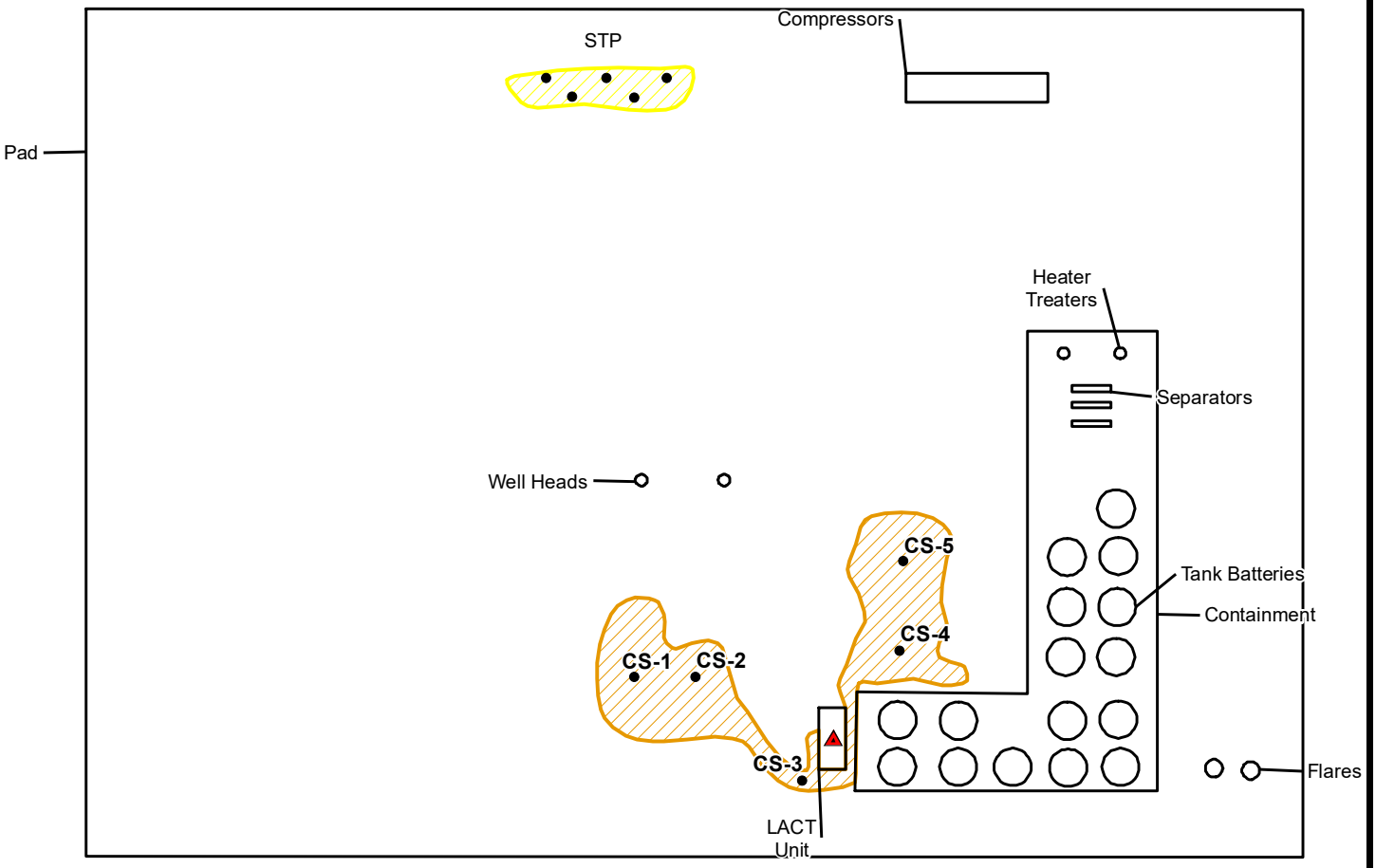
ENSOLUM
Environmental & Hydrogeologic Consultants

SITE VICINITY MAP

MARATHON OIL PERMIAN LLC
GRAMA RIDGE 8 STATE COM #002H
Lea County, New Mexico
32.399529° N, 103.489403° W

PROJECT NUMBER: 03B1206009

FIGURE
2



LEGEND:

- Release Point
- Confirmation Soil Sample Location
- Flow Path
- Stockpile Location

0 40 80 Feet

ENSOLUM
Environmental & Hydrogeologic Consultants

SITE MAP

MARATHON OIL PERMIAN LLC
GRAMA RIDGE 8 STATE COM #002H
Lea County, New Mexico
32.399529° N, 103.489403° W

PROJECT NUMBER: 03B1206009

FIGURE
3

ENSOLUM

APPENDIX B

Supporting Figures & Documentation

OSE POD Locations

Points of Diversion visible at 1:19,000 with 1,000 features per view

Water Rights Look Up

Measurement

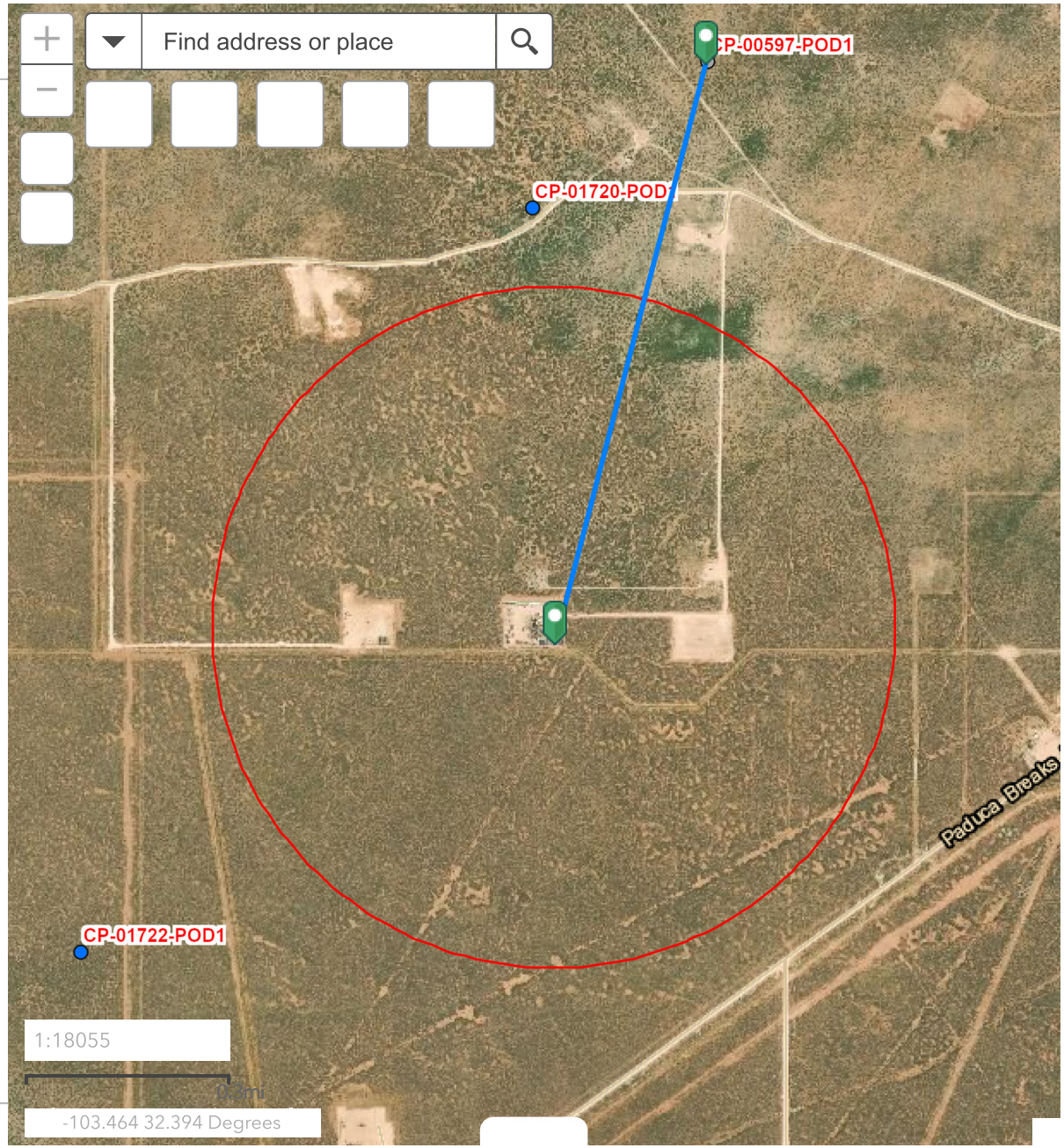
| Miles

Measurement Result

0.88 Miles

Clear

Press CTRL to enable snapping



SF

Revised December 1975 80227 19

IMPORTANT — READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM.

Declaration of Owner of Underground Water Right

CAPITAN BASIN
BASIN NAME

Declaration No. CP-597 Date received April 17, 1979 '79 APR 20 PM 3 01

STATE ENGINEER OFFICE
SANTA FE, N.M. 87501

STATEMENT

1. Name of Declarant THE MERCHANT LIVESTOCK COMPANY
   Mailing Address P.O. Box 548 Carlsbad
   County of Eddy, State of New Mexico
2. Source of water supply shallow
   (artesian or shallow water aquifer)
3. Describe well location under one of the following subheadings:
   a. ____ ¼ NE ¼ NE ¼ of Sec. 8 Twp. 22 S Rge. 34 E N.M.P.M., in Lea County.
   b. Tract No. ____ of Map No. ____ of the ____.
   c. X = ____ feet, Y = ____ feet, N. M. Coordinate System ____ Zone in the ____ Grant.
   On land owned by ____.
4. Description of well: date drilled 1918 driller ____ depth 35' feet.
   outside diameter of casing 6 5/8 inches; original capacity ____ gal. per min.; present capacity 3 gal. per min.; pumping lift ____ feet; static water level 31 feet (above) (~~below~~) land surface;
   make and type of pump ____
   make, type, horsepower, etc., of power plant ____
   Fractional or percentage interest claimed in well 100%
5. Quantity of water appropriated and beneficially used ~~XXXXXXXXXXXX~~ up to 3 (acre feet per annum)
   for stock water purposes.
6. Acreage actually irrigated ____ acres, located and described as follows (describe only lands actually irrigated):

Subdivision	Sec.	Twp.	Range	Acres Irrigated	Owner
			stock only		The Merchant Livestock Co.

(Note: location of well and acreage actually irrigated must be shown on plat on reverse side.)

'79 APR 17 AM 8 01
STATE ENGINEER OFFICE
ROSWELL, N.M.

7. Water was first applied to beneficial use ____ month ____ day 1918 year and since that time has been used fully and continuously on all of the above described lands or for the above described purposes except as follows: ____
8. Additional statements or explanations
   name of well - Hamilton

I, J. D. Merchant, Jr., President being first duly sworn upon my oath, depose and say that the above is a full and complete statement prepared in accordance with the instructions on the reverse side of this form and submitted in evidence of ownership of a valid underground water right, that I have carefully read each and all of the items contained therein and that the same are true to the best of my knowledge and belief.

THE MERCHANT LIVESTOCK CO., declarant.
by: J. D. Merchant, Jr., President

Subscribed and sworn to before me this 12th day of April, A.D. 19 79

My commission expires March 2, 1980

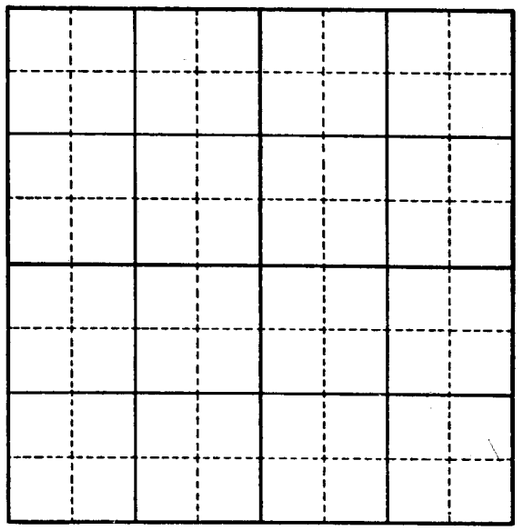
Notary Public

FILED

UNDER NEW MEXICO LAW A DECLARATION IS ONLY A STATEMENT OF DECLARANT'S CLAIM. ACCEPTANCE FOR FILING DOES NOT CONSTITUTE APPROVAL OR REJECTION OF THE CLAIM.

Locate well and areas actually irrigated as accurately as possible on following plat:

Section (s) ....., **Township** ....., **Range** ..... **N. M. P. M.**



INSTRUCTIONS

Declaration shall be executed (preferably typewritten) in triplicate and must be accompanied by a **$1.00 filing fee. Each of triplicate copies must be properly signed and attested.**

A separate declaration must be filed for each well in use.

All blanks shall be filled out fully. Required information which cannot be sworn to by declarant shall be supplied by affidavit of person or persons familiar with the facts and shall be submitted herewith.

Secs. 1-3. Complete all blanks.

Sec. 4. Fill out all blanks applicable as fully as possible.

Sec. 5. Irrigation use shall be stated in acre feet of water per acre per year applied on the land. If used for domestic, municipal. or other purposes, state total quantity in acre feet used annually.

Sec. 6. Describe only the acreage actually irrigated. When necessary to clearly define irrigated acreages, describe to nearest 2½ acre subdivision. If located on unsurveyed lands. describe by legal supdivision "as projected" from the nearest government survey corners, or describe by metes and bounds and tie survey to some permanent, easily-located natural object.

Sec. 7. Explain and give dates as nearly as possible of any years when all or part of acreage claimed was not irrigated.

Sec. 8. If well irrigates or supplies supplemental water to any other land than that described above, or if land is also irrigated from any other source, explain under this section. Give any other data necessary to fully describe water right.

If additional space is necessary, use a separate sheet or sheets and attach securely hereto.

April 17, 1979

Files: CP-584; CP-585; CP-586; CP-587; CP-588;
CP-589; CP-590; CP-591; CP-592; CP-593;
CP-594; CP-595; CP-596; CP-597; CP-598;
CP-599; CP-600; CP-601; CP-602

The Merchant Livestock Company
P. O. Box 548
Carlsbad, NM 88220

Gentlemen:

Enclosed are your copies of Declarations of Owner of Underground Water Right as numbered above, which have been filed for record in the office of the State Engineer.

Please refer to each individual number in all future correspondence concerning these declarations.

The filing of these declarations does not indicate affirmation or rejection of the statements contained therein.

Yours very truly,

J. C. Groseclose
Basin Supervisor

JCG/fh
Encls.
cc: Santa Fe

U.S. Fish and Wildlife Service
National Wetlands Inventory

Grama Ridge

October 15, 2019

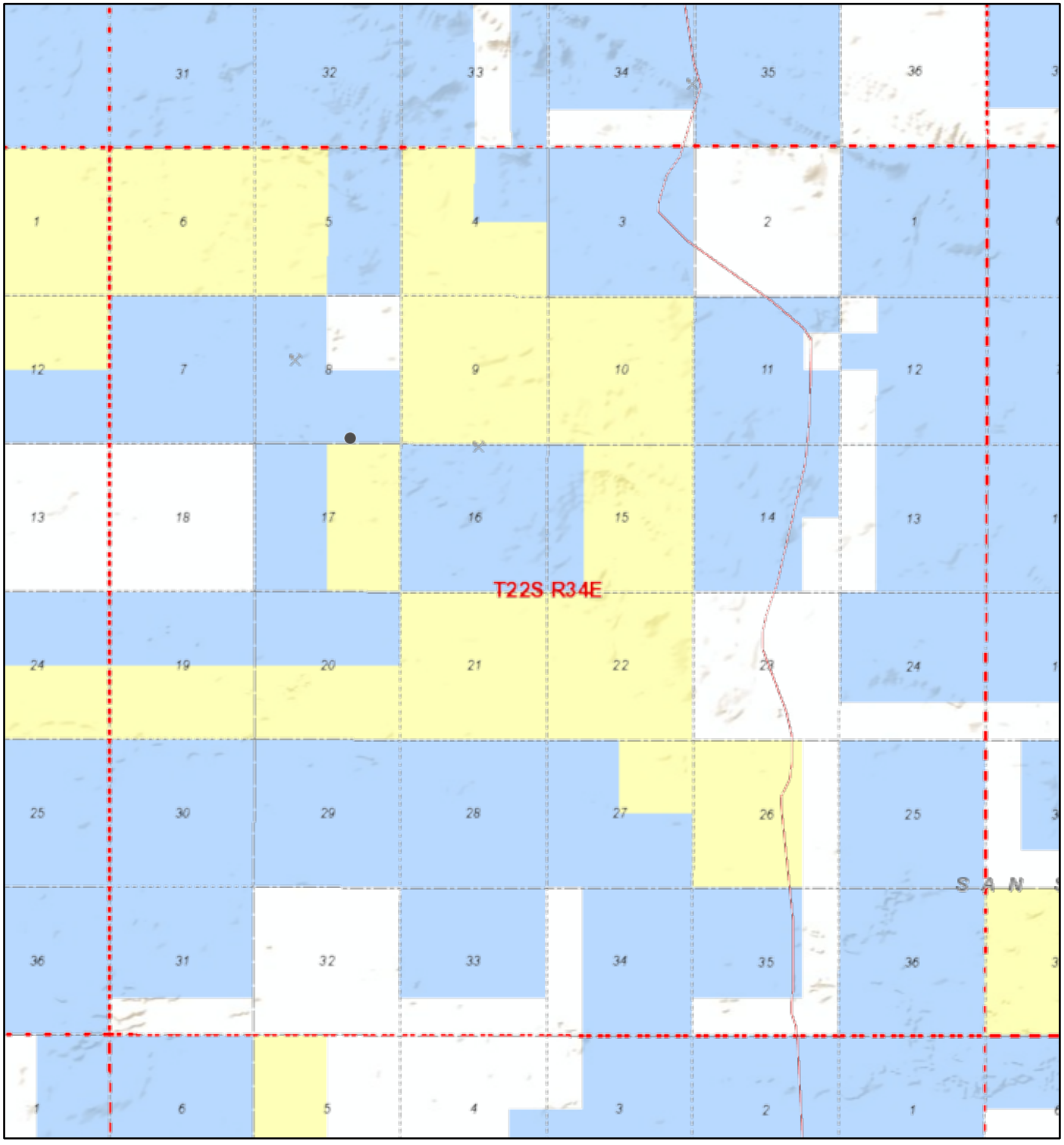
Wetlands

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

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

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

Active Mines in New Mexico



10/15/2019, 9:54:30 AM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Registered Mines

Aggregate, Stone etc.

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

EMNRD MMD GIS Coordinator
NM Energy, Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=1b5e577974664d689b47790897ca2795)

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APPENDIX C

Photographic Documentation

View of the release area during remediation activities, facing south.

View of the release area during remediation activities, facing south.

View of the release area during remediation activities, facing east.

View of flow path during remediation activities, facing southwest.

View of the release area during remediation activities, facing south.

View of the release area during remediation activities, facing south.

View of the release area during remediation activities, facing east.

View of the release area during remediation activities, facing east.

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APPENDIX D

Table 1 – Soil Analytical Summary

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TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
Marathon Oil Permian LLC - Grama Ridge 8 State Com #002H
Lea County, New Mexico

Ensolum Project No. 03B1206009

Sample I.D.	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH MRO (mg/kg)	Total TPH (GRO+DRO+MRO) (mg/kg)	Chloride (mg/kg)
New Mexico Oil Conservation Division Closure Criteria for Soils Impacted by a Release (≤ 50 feet)			**10**	**NE**	**NE**	**NE**	**50**	**NE**	**NE**	**NE**	**100**	**600**
Confirmation Soil Sample Analytical Results												
CS-1	10/4/2019	1.5	<0.000207	<0.000998	<0.000335	<0.000436	<0.000207	<15.0	<15.0	<15.0	<15.0	**6.36**
CS-2	10/4/2019	1	<0.000207	<0.000998	<0.000335	<0.000436	<0.000207	<15.0	<15.0	<15.0	<15.0	**200**
CS-3	10/4/2019	2.5	<0.000206	<0.000996	<0.000334	<0.000435	<0.000206	<15.0	<15.0	<15.0	<15.0	**9.01**
CS-4	10/4/2019	2	<0.000207	<0.00100	<0.000336	<0.000438	<0.000207	<14.9	<14.9	<14.9	<14.9	**4.02 J**
CS-5	10/4/2019	1	<0.000208	<0.00101	**0.000795 J**	**0.00305**	**0.00385**	<15.0	**74.0**	<15.0	**74.0**	**201**
Stockpile Soil Sample Analytical Results												
STP	10/4/2019	NA	**0.0514**	**0.863**	**0.759**	**3.78**	**5.45**	**489**	**6,030**	**549**	**7,070**	**166**

*Concentrations in **bold** and yellow exceed the New Mexico Oil Conservation Division Closure Criteria for Soils Impacted by a Release (≤50 feet)*

bgs: below ground surface

J: The target analyte was positively identified below the quantitation limit and above the detection limit.

mg/kg: milligrams per kilogram

NA: Not Applicable

NE: Not Established

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

MRO = Motor Oil/Lube Oil Range Organics

TPH = Total Petroleum Hydrocarbon

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APPENDIX E

Laboratory Analytical Reports & Chain-of-Custody Documentation

Analytical Report 639137

for

Ensolum

Project Manager: Beaux Jennings

Gramma Ridge

03B1206009

10-OCT-19

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

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10-OCT-19

Project Manager: **Beaux Jennings**
Ensolum
2351 W Northwest Highway
Suite 1203
Dallas, TX 75220

Reference: XENCO Report No(s): **639137**
Gramma Ridge
Project Address:

Beaux Jennings:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 639137. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 639137 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Jessica Kramer
Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America

Sample Cross Reference 639137

Ensolum, Dallas, TX

Gramma Ridge

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
CS-1	S	10-04-19 09:50	1.5 ft	639137-001
CS-2	S	10-04-19 09:52	1 ft	639137-002
CS-3	S	10-04-19 09:55	2.5 ft	639137-003
CS-4	S	10-04-19 10:00	2 ft	639137-004
CS-5	S	10-04-19 10:02	1 ft	639137-005
STP	S	10-04-19 09:25		639137-006

CASE NARRATIVE

Client Name: Ensolum

Project Name: Gramma Ridge

Project ID:	*03B1206009*	Report Date:	*10-OCT-19*
Work Order Number(s):	*639137*	Date Received:	*10/07/2019*

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results
639137
Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-1** Matrix: Soil Sample Depth: 1.5 ft

Lab Sample Id: 639137-001 Date Collected: 10.04.19 09.50 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**6.36**	4.96	0.852	mg/kg	10.07.19 18:53		1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	50.0	15.0	mg/kg	10.09.19 22:41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	50.0	15.0	mg/kg	10.09.19 22:41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	50.0	15.0	mg/kg	10.09.19 22:41	U	1
Total TPH	PHC635	<15.0		15.0	mg/kg	10.09.19 22:41	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	83	70 - 135	%		
o-Terphenyl	91	70 - 135	%		

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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-1** Matrix: Soil Sample Depth: 1.5 ft

Lab Sample Id: 639137-001 Date Collected: 10.04.19 09.50 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000207	0.000998	0.000207	mg/kg	10.08.19 14:15	U	1
Toluene	108-88-3	<0.000998	0.00499	0.000998	mg/kg	10.08.19 14:15	U	1
Ethylbenzene	100-41-4	<0.000335	0.000998	0.000335	mg/kg	10.08.19 14:15	U	1
m,p-Xylenes	179601-23-1	<0.000436	0.00200	0.000436	mg/kg	10.08.19 14:15	U	1
o-Xylene	95-47-6	<0.000983	0.000998	0.000983	mg/kg	10.08.19 14:15	U	1
Total Xylenes	1330-20-7	<0.000436		0.000436	mg/kg	10.08.19 14:15	U	
Total BTEX		<0.000207		0.000207	mg/kg	10.08.19 14:15	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	96	53 - 142	%		
1,2-Dichloroethane-D4	91	53 - 150	%		
Toluene-D8	96	70 - 130	%		

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Sample Id: **CS-2** Matrix: Soil Sample Depth: 1 ft

Lab Sample Id: 639137-002 Date Collected: 10.04.19 09.52 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**200**	4.99	0.857	mg/kg	10.07.19 18:58		1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	50.0	15.0	mg/kg	10.09.19 23:43	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	50.0	15.0	mg/kg	10.09.19 23:43	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	50.0	15.0	mg/kg	10.09.19 23:43	U	1
Total TPH	PHC635	<15.0		15.0	mg/kg	10.09.19 23:43	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	84	70 - 135	%		
o-Terphenyl	91	70 - 135	%		

Certificate of Analytical Results
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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-2** Matrix: Soil Sample Depth: 1 ft

Lab Sample Id: 639137-002 Date Collected: 10.04.19 09.52 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000207	0.000998	0.000207	mg/kg	10.08.19 14:33	U	1
Toluene	108-88-3	<0.000998	0.00499	0.000998	mg/kg	10.08.19 14:33	U	1
Ethylbenzene	100-41-4	<0.000335	0.000998	0.000335	mg/kg	10.08.19 14:33	U	1
m,p-Xylenes	179601-23-1	<0.000436	0.00200	0.000436	mg/kg	10.08.19 14:33	U	1
o-Xylene	95-47-6	<0.000983	0.000998	0.000983	mg/kg	10.08.19 14:33	U	1
Total Xylenes	1330-20-7	<0.000436		0.000436	mg/kg	10.08.19 14:33	U	
Total BTEX		<0.000207		0.000207	mg/kg	10.08.19 14:33	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	100	53 - 142	%		
1,2-Dichloroethane-D4	96	53 - 150	%		
Toluene-D8	97	70 - 130	%		

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Ensolum, Dallas, TX
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Sample Id: **CS-3** Matrix: Soil Sample Depth: 2.5 ft

Lab Sample Id: 639137-003 Date Collected: 10.04.19 09.55 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**9.01**	4.95	0.850	mg/kg	10.07.19 19:14		1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	49.9	15.0	mg/kg	10.10.19 00:04	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	49.9	15.0	mg/kg	10.10.19 00:04	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	49.9	15.0	mg/kg	10.10.19 00:04	U	1
Total TPH	PHC635	<15.0		15.0	mg/kg	10.10.19 00:04	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	81	70 - 135	%		
o-Terphenyl	89	70 - 135	%		

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Ensolum, Dallas, TX
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Sample Id: **CS-3** Matrix: Soil Sample Depth: 2.5 ft

Lab Sample Id: 639137-003 Date Collected: 10.04.19 09.55 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000206	0.000996	0.000206	mg/kg	10.08.19 14:50	U	1
Toluene	108-88-3	<0.000996	0.00498	0.000996	mg/kg	10.08.19 14:50	U	1
Ethylbenzene	100-41-4	<0.000334	0.000996	0.000334	mg/kg	10.08.19 14:50	U	1
m,p-Xylenes	179601-23-1	<0.000435	0.00199	0.000435	mg/kg	10.08.19 14:50	U	1
o-Xylene	95-47-6	<0.000981	0.000996	0.000981	mg/kg	10.08.19 14:50	U	1
Total Xylenes	1330-20-7	<0.000435		0.000435	mg/kg	10.08.19 14:50	U	
Total BTEX		<0.000206		0.000206	mg/kg	10.08.19 14:50	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	95	53 - 142	%		
1,2-Dichloroethane-D4	92	53 - 150	%		
Toluene-D8	89	70 - 130	%		

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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-4** Matrix: Soil Sample Depth: 2 ft

Lab Sample Id: 639137-004 Date Collected: 10.04.19 10.00 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**4.02**	5.00	0.858	mg/kg	10.07.19 19:20	J	1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	49.8	14.9	mg/kg	10.10.19 00:25	U	1
Diesel Range Organics (DRO)	C10C28DRO	<14.9	49.8	14.9	mg/kg	10.10.19 00:25	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<14.9	49.8	14.9	mg/kg	10.10.19 00:25	U	1
Total TPH	PHC635	<14.9		14.9	mg/kg	10.10.19 00:25	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	82	70 - 135	%		
o-Terphenyl	91	70 - 135	%		

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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-4** Matrix: Soil Sample Depth: 2 ft

Lab Sample Id: 639137-004 Date Collected: 10.04.19 10.00 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000207	0.00100	0.000207	mg/kg	10.08.19 15:08	U	1
Toluene	108-88-3	<0.00100	0.00501	0.00100	mg/kg	10.08.19 15:08	U	1
Ethylbenzene	100-41-4	<0.000336	0.00100	0.000336	mg/kg	10.08.19 15:08	U	1
m,p-Xylenes	179601-23-1	<0.000438	0.00200	0.000438	mg/kg	10.08.19 15:08	U	1
o-Xylene	95-47-6	<0.000987	0.00100	0.000987	mg/kg	10.08.19 15:08	U	1
Total Xylenes	1330-20-7	<0.000438		0.000438	mg/kg	10.08.19 15:08	U	
Total BTEX		<0.000207		0.000207	mg/kg	10.08.19 15:08	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	95	53 - 142	%		
1,2-Dichloroethane-D4	89	53 - 150	%		
Toluene-D8	93	70 - 130	%		

Certificate of Analytical Results
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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-5** Matrix: Soil Sample Depth: 1 ft

Lab Sample Id: 639137-005 Date Collected: 10.04.19 10.02 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**201**	5.04	0.865	mg/kg	10.07.19 19:25		1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	50.0	15.0	mg/kg	10.10.19 00:46	U	1
Diesel Range Organics (DRO)	C10C28DRO	**74.0**	50.0	15.0	mg/kg	10.10.19 00:46		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	50.0	15.0	mg/kg	10.10.19 00:46	U	1
Total TPH	PHC635	**74.0**		15.0	mg/kg	10.10.19 00:46		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	82	70 - 135	%		
o-Terphenyl	91	70 - 135	%		

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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **CS-5** Matrix: Soil Sample Depth: 1 ft

Lab Sample Id: 639137-005 Date Collected: 10.04.19 10.02 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000208	0.00101	0.000208	mg/kg	10.08.19 15:25	U	1
Toluene	108-88-3	<0.00101	0.00503	0.00101	mg/kg	10.08.19 15:25	U	1
Ethylbenzene	100-41-4	**0.000795**	0.00101	0.000338	mg/kg	10.08.19 15:25	J	1
m,p-Xylenes	179601-23-1	**0.00168**	0.00201	0.000439	mg/kg	10.08.19 15:25	J	1
o-Xylene	95-47-6	**0.00137**	0.00101	0.000991	mg/kg	10.08.19 15:25		1
Total Xylenes	1330-20-7	**0.00305**		0.000439	mg/kg	10.08.19 15:25		
Total BTEX		**0.00385**		0.000208	mg/kg	10.08.19 15:25		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	99	53 - 142	%		
1,2-Dichloroethane-D4	97	53 - 150	%		
Toluene-D8	99	70 - 130	%		

Certificate of Analytical Results
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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **STP** Matrix: Soil Sample Depth:

Lab Sample Id: 639137-006 Date Collected: 10.04.19 09.25 Date Received: 10.07.19 08.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**166**	5.05	0.867	mg/kg	10.07.19 19:30		1

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	**489**	49.9	15.0	mg/kg	10.10.19 01:07		1
Diesel Range Organics (DRO)	C10C28DRO	**6030**	49.9	15.0	mg/kg	10.10.19 01:07		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**549**	49.9	15.0	mg/kg	10.10.19 01:07		1
Total TPH	PHC635	**7070**		15.0	mg/kg	10.10.19 01:07		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	121	70 - 135	%		
o-Terphenyl	108	70 - 135	%		

Certificate of Analytical Results
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Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **STP** Matrix: Soil Sample Depth:

Lab Sample Id: 639137-006 Date Collected: 10.04.19 09.25 Date Received: 10.07.19 08.30

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 13.45

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0514**	0.00100	0.000207	mg/kg	10.08.19 16:00		1
Toluene	108-88-3	**0.863**	0.125	0.0249	mg/kg	10.08.19 16:18	D	25
Ethylbenzene	100-41-4	**0.759**	0.0249	0.00836	mg/kg	10.08.19 16:18	D	25
m,p-Xylenes	179601-23-1	**2.58**	0.0498	0.0109	mg/kg	10.08.19 16:18	D	25
o-Xylene	95-47-6	**1.20**	0.0249	0.0245	mg/kg	10.08.19 16:18	D	25
Total Xylenes	1330-20-7	**3.78**		0.0109	mg/kg	10.08.19 16:18		
Total BTEX		**5.45**		0.000207	mg/kg	10.08.19 16:18		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	91	53 - 142	%		
1,2-Dichloroethane-D4	85	53 - 150	%		
Toluene-D8	123	70 - 130	%		

Certificate of Analytical Results
639137
Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **7687628-1-BLK** Matrix: Solid Sample Depth:

Lab Sample Id: 7687628-1-BLK Date Collected: Date Received:

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Analyst: CHE % Moist: Tech: CHE

Seq Number: 3103554 Date Prep: 10.07.19 14.00

Prep seq: 7687628

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	<0.858	5.00	0.858	mg/kg	10.07.19 17:07	U	1

Sample Id: **7687687-1-BLK** Matrix: Solid Sample Depth:

Lab Sample Id: 7687687-1-BLK Date Collected: Date Received:

Analytical Method: BTEX by SW 8260C Prep Method: 5035A

Analyst: CRL % Moist: Tech: CRL

Seq Number: 3103624 Date Prep: 10.08.19 09.30

Subcontractor: SUB: T104704215-19-30 Prep seq: 7687687

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000207	0.00100	0.000207	mg/kg	10.08.19 11:41	U	1
Toluene	108-88-3	<0.00100	0.00500	0.00100	mg/kg	10.08.19 11:41	U	1
Ethylbenzene	100-41-4	<0.000336	0.00100	0.000336	mg/kg	10.08.19 11:41	U	1
m,p-Xylenes	179601-23-1	<0.000437	0.00200	0.000437	mg/kg	10.08.19 11:41	U	1
o-Xylene	95-47-6	<0.000985	0.00100	0.000985	mg/kg	10.08.19 11:41	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	95	53 - 142	%		
1,2-Dichloroethane-D4	91	53 - 150	%		
Toluene-D8	91	70 - 130	%		

Certificate of Analytical Results
639137
Ensolum, Dallas, TX
Gramma Ridge

Sample Id: **7687811-1-BLK** Matrix: Solid Sample Depth:

Lab Sample Id: 7687811-1-BLK Date Collected: Date Received:

Analytical Method: TPH by SW8015 Mod Prep Method: 8015

Analyst: ARM % Moist: Tech: DVM

Seq Number: 3103878 Date Prep: 10.09.19 17.00

Prep seq: 7687811

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	50.0	15.0	mg/kg	10.09.19 21:39	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	50.0	15.0	mg/kg	10.09.19 21:39	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	50.0	15.0	mg/kg	10.09.19 21:39	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	83	70 - 135	%		
o-Terphenyl	93	70 - 135	%		

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: Gramma Ridge

Work Orders : 639137, **Project ID:** 03B1206009

Lab Batch #: 3103624 **Sample:** 7687687-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/08/19 10:25

BTEX by SW 8260C Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0492	0.0500	98	53-142	
1,2-Dichloroethane-D4	0.0468	0.0500	94	53-150	
Toluene-D8	0.0471	0.0500	94	70-130	

Lab Batch #: 3103624 **Sample:** 7687687-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/08/19 10:43

BTEX by SW 8260C Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0461	0.0500	92	53-142	
1,2-Dichloroethane-D4	0.0457	0.0500	91	53-150	
Toluene-D8	0.0440	0.0500	88	70-130	

Lab Batch #: 3103624 **Sample:** 7687687-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/08/19 11:41

BTEX by SW 8260C Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0473	0.0500	95	53-142	
1,2-Dichloroethane-D4	0.0457	0.0500	91	53-150	
Toluene-D8	0.0456	0.0500	91	70-130	

Lab Batch #: 3103624 **Sample:** 638964-003 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/08/19 13:09

BTEX by SW 8260C Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0521	0.0500	104	53-142	
1,2-Dichloroethane-D4	0.0499	0.0500	100	53-150	
Toluene-D8	0.0479	0.0500	96	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Gramma Ridge

Work Orders : 639137, **Project ID:** 03B1206009

Lab Batch #: 3103624 **Sample:** 638964-003 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/08/19 13:27

BTEX by SW 8260C Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0514	0.0500	103	53-142	
1,2-Dichloroethane-D4	0.0461	0.0500	92	53-150	
Toluene-D8	0.0472	0.0500	94	70-130	

Lab Batch #: 3103878 **Sample:** 7687811-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/09/19 21:39

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.2	100	83	70-135	
o-Terphenyl	46.5	50.0	93	70-135	

Lab Batch #: 3103878 **Sample:** 7687811-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/09/19 21:59

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.7	100	95	70-135	
o-Terphenyl	49.5	50.0	99	70-135	

Lab Batch #: 3103878 **Sample:** 7687811-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/09/19 22:20

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.0	100	93	70-135	
o-Terphenyl	46.9	50.0	94	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Gramma Ridge

Work Orders : 639137, **Project ID:** 03B1206009

Lab Batch #: 3103878 **Sample:** 639137-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/09/19 23:02

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.8	106	70-135	
o-Terphenyl	52.5	49.9	105	70-135	

Lab Batch #: 3103878 **Sample:** 639137-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/09/19 23:22

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.5	99.7	90	70-135	
o-Terphenyl	44.7	49.9	90	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: Gramma Ridge

Work Order #: 639137 **Project ID:** 03B1206009

Analyst: CRL **Date Prepared:** 10/08/2019 **Date Analyzed:** 10/08/2019

Lab Batch ID: 3103624 **Sample:** 7687687-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by SW 8260C Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000207	0.0500	0.0455	91	0.0500	0.0429	86	6	62-132	25	
Toluene	<0.00100	0.0500	0.0433	87	0.0500	0.0409	82	6	66-124	25	
Ethylbenzene	<0.000336	0.0500	0.0430	86	0.0500	0.0408	82	5	71-134	25	
m,p-Xylenes	<0.000437	0.100	0.0829	83	0.100	0.0791	79	5	69-128	25	
o-Xylene	<0.000985	0.0500	0.0466	93	0.0500	0.0405	81	14	72-131	25	

Analyst: CHE **Date Prepared:** 10/07/2019 **Date Analyzed:** 10/07/2019

Lab Batch ID: 3103554 **Sample:** 7687628-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<0.858	250	241	96	250	240	96	0	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: Gramma Ridge

Work Order #: 639137 **Project ID:** 03B1206009

Analyst: ARM **Date Prepared:** 10/09/2019 **Date Analyzed:** 10/09/2019

Lab Batch ID: 3103878 **Sample:** 7687811-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1030	103	1000	1050	105	2	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1040	104	1000	1040	104	0	70-135	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: Gramma Ridge

Work Order # : 639137 **Project ID:** 03B1206009

Lab Batch ID: 3103624 **QC- Sample ID:** 638964-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/08/2019 **Date Prepared:** 10/08/2019 **Analyst:** CRL

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by SW 8260C Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00105	0.253	0.234	92	0.250	0.224	90	4	62-132	25	
Toluene	<0.00505	0.253	0.208	82	0.250	0.208	83	0	66-124	25	
Ethylbenzene	<0.00170	0.253	0.211	83	0.250	0.206	82	2	71-134	25	
m,p-Xylenes	<0.00221	0.505	0.402	80	0.500	0.381	76	5	69-128	25	
o-Xylene	0.00624	0.253	0.234	90	0.250	0.220	86	6	72-131	25	

Lab Batch ID: 3103554 **QC- Sample ID:** 639132-016 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/07/2019 **Date Prepared:** 10/07/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	260	249	483	90	249	483	90	0	90-110	20	

Lab Batch ID: 3103554 **QC- Sample ID:** 639132-026 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/07/2019 **Date Prepared:** 10/07/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	437	250	660	89	250	667	92	1	90-110	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Gramma Ridge

Work Order # : 639137 **Project ID:** 03B1206009

Lab Batch ID: 3103878 **QC- Sample ID:** 639137-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/09/2019 **Date Prepared:** 10/09/2019 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	1180	118	997	1030	103	14	70-135	20	
Diesel Range Organics (DRO)	<15.0	998	1120	112	997	946	95	17	70-135	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

XENCO LABORATORIES

Chain of Custody

Work Order No: 639137

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296
Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000)

www.xenco.com Page 1 of 1

Project Manager:	Beaux Jennings	Bill to: (if different)	
Company Name:	Ensolum, LLC	Company Name:	
Address:	705 W. Wadley Ave, Ste. 210	Address:	
City, State ZIP:	Midland, TX 79705	City, State ZIP:	
Phone:	210-219-8858 Email: bjennings@ensolum.com		

Work Order Comments

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:
Reporting: Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

Project Name:	Grama Ridge	Turn Around	
Project Number:	03B1206009	Routine ☒	
P.O. Number:	03B1206009	Rush:	
Sampler's Name:	Beaux Jennings	Due Date: 10/4/19	

SAMPLE RECEIPT			
Temperature (°C):	0.5/0.3	Temp Blank: Yes (No)	Wet Ice: (Yes) No
Received Intact:	(Yes) No	Thermometer ID	BE
Cooler Custody Seals:	Yes No (N/A)	Correction Factor:	-0.2
Sample Custody Seals:	Yes No (N/A)	Total Containers:	

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	BTEX SW-846 #8260	TPH #8015	Chloride EPA 300.0
CS-1	S	10/4/19	0950	1.5'	1	X	X	X
CS-2			0952	1'	1			
CS-3			0955	2.5'	1			
CS-4			1000	2'	1			
CS-5			1002	1'	1			
STP	S	10/4/19	0925	—	1	X	X	X
NFE BS 10/4/19								

ANALYSIS REQUEST

Work Order Notes

TAT starts the day recevied by the lab, if received by 4:30pm

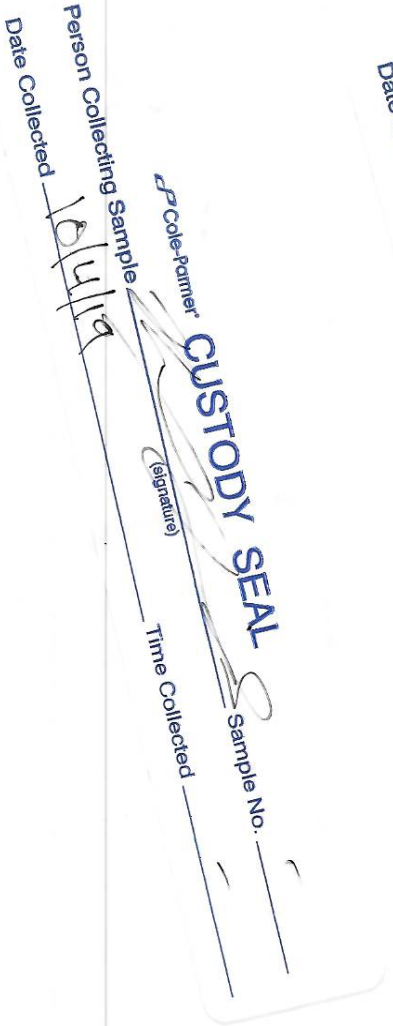
Sample Comments

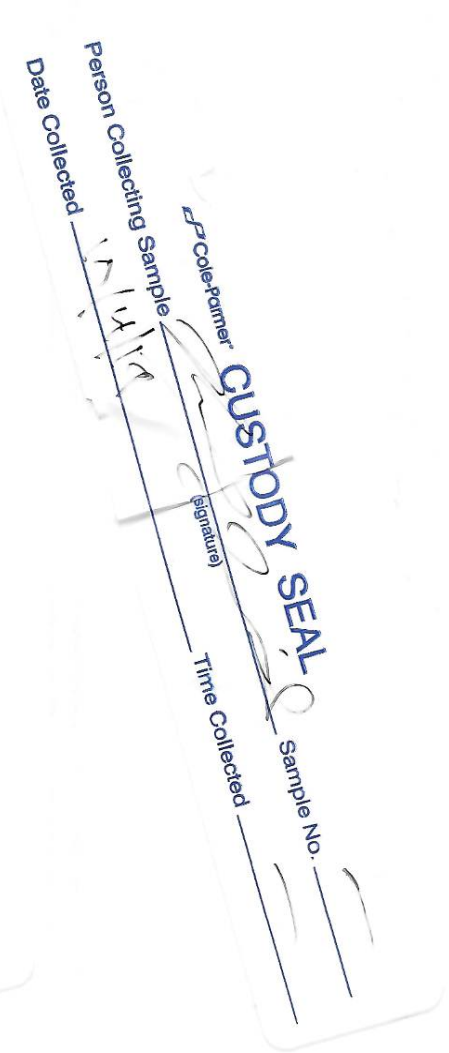
Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed **TCLP / SPLP 6010:** 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U **1631 / 245.1 / 7470 / 7471** : Hg

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1			2		
3		10/7/19 0830	4		
5			6		

Revised Date 051418 Rev. 2018.1


Cole-Parmer
CUSTODY SEAL
Person Collecting Sample
(signature)
Sample No.
Date Collected
Time Collected


Cole-Parmer
CUSTODY SEAL
Person Collecting Sample
(signature)
Sample No.
Date Collected
Time Collected

Inter-Office Shipment

IOS Number : 49447

Date/Time:	10.07.2019	Created by:	Brianna Teel	Please send report to:	Jessica Kramer
Lab# From:	**Midland**	Delivery Priority:		Address:	1211 W. Florida Ave
Lab# To:	**Houston**	Air Bill No.:	776572159733	E-Mail:	jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
639137-001	S	CS-1	10.04.2019 09:50	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	
639137-002	S	CS-2	10.04.2019 09:52	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	
639137-003	S	CS-3	10.04.2019 09:55	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	
639137-004	S	CS-4	10.04.2019 10:00	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	
639137-005	S	CS-5	10.04.2019 10:02	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	
639137-006	S	STP	10.04.2019 09:25	SW8260CBTEX	BTEX by SW 8260C	**10.10.2019**	10.18.2019	JKR	BZ BZME EBZ XYLENE	

Inter Office Shipment or Sample Comments:

Relinquished By: Brianna Teel

Date Relinquished: 10.07.2019

Received By: Travis Simmons

Date Received: 10.08.2019

Cooler Temperature: 1.5

XENCO Laboratories

Inter Office Report- Sample Receipt Checklist

Sent To: Houston

IOS #: 49447

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient
Temperature Measuring device used : HOU-068

Sent By: Brianna Teel **Date Sent:** 10.07.2019 08.54 AM

Received By: Travis Simmons **Date Received:** 10.08.2019 09.20 AM

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	1.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received with appropriate temperature?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 *Custody Seals Signed and dated for Containers/coolers	**Yes**
#6 *IOS present?	**Yes**
#7 Any missing/extra samples?	**No**
#8 IOS agrees with sample label(s)/matrix?	**Yes**
#9 Sample matrix/ properties agree with IOS?	**Yes**
#10 Samples in proper container/ bottle?	**Yes**
#11 Samples properly preserved?	**Yes**
#12 Sample container(s) intact?	**Yes**
#13 Sufficient sample amount for indicated test(s)?	**Yes**
#14 All samples received within hold time?	**Yes**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

NonConformance:

Corrective Action Taken:

Nonconformance Documentation

Contact: _____ **Contacted by :** _____ **Date:** _____

Checklist reviewed by: Travis Simmons Date: 10.08.2019

Travis Simmons

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Ensolum

Date/ Time Received: 10/07/2019 08:30:00 AM

Work Order #: 639137

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	.3	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received on ice?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**	
#5 Custody Seals intact on sample bottles?	**N/A**	
#6*Custody Seals Signed and dated?	**Yes**	
#7 *Chain of Custody present?	**Yes**	
#8 Any missing/extra samples?	**No**	
#9 Chain of Custody signed when relinquished/ received?	**Yes**	
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**	
#11 Container label(s) legible and intact?	**Yes**	
#12 Samples in proper container/ bottle?	**Yes**	
#13 Samples properly preserved?	**Yes**	
#14 Sample container(s) intact?	**Yes**	
#15 Sufficient sample amount for indicated test(s)?	**Yes**	
#16 All samples received within hold time?	**Yes**	
#17 Subcontract of sample(s)?	**Yes**	Xenco Stafford-BTEX8260
#18 Water VOC samples have zero headspace?	**N/A**	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 10/07/2019
Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 10/07/2019
Jessica Kramer

ENSOLUM

APPENDIX F

C-141

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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	NRM1927358476
District RP	1RP-5715
Facility ID	fBBB1215748931
Application ID	pRM1927358619

Release Notification

Responsible Party

Responsible Party Marathon Oil Permian LLC	OGRID 372098
Contact Name Isaac Castro	Contact Telephone 575-988-0561
Contact email icastro@marathonoil.com	Incident # *(assigned by OCD)*
Contact mailing address 4111 S. Tidwell Rd., Carlsbad, NM 88220	

Location of Release Source

Latitude 32.399529 Longitude -103.489403
(NAD 83 in decimal degrees to 5 decimal places)

Site Name GRAMA RIDGE 8 STATE COM #002H	Site Type Oil and gas drilling facility
Date Release Discovered 9/5/19	API# *(if applicable)* 30-025-43607

Unit Letter	Section	Township	Range	County
O	05	22S	34E	Lea

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

Nature and Volume of Release

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

☒ Crude Oil	Volume Released (bbls) 12.5 bbls	Volume Recovered (bbls) 10 bbls
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

Operator reported a spill due to the lact air eliminator leaking. Approximately 12.5 bbls were spilled to the ground. A vac truck was immediately dispatched to recover fluids and recovered 10 bbls. All spillage is contained on location.

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NRM1927358476
District RP	1RP-5715
Facility ID	fBBB1215748931
Application ID	pRM1927358619

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

Initial Response

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

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

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

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

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

Printed Name: Isaac Castro Title: Environmental Professional

Signature: Isaac Castro Date: 9/19/19

email: icastro@marathonoil.com Telephone: 575-988-0561

OCD Only

Received by: Ramona Marcus Date: 09/30/2019

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State of New Mexico
Oil Conservation Division

Incident ID	
District RP	1RP-5715
Facility ID	
Application ID	

Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	31 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

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

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

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

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

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

Printed Name: Isaac Castro Title: Environmental Professional

Signature: Isaac Castro Date: 11/13/19

email: icastro@marathonoil.com Telephone: 575-988-0561

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Closure

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

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

☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☒ Description of remediation activities

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

Printed Name: Isaac Castro Title: Environmental Professional

Signature: Isaac Castro Date: 11/13/19

email: icastro@marathonoil.com Telephone: 575-988-0561

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____