SITE INFORMATION

Report Type: Work Plan 1RP-5045

General Site Information:						
Site:	**Battle 1H**					
Company:	**Marathon Oil Permian, LLC.**					
Section, Township and Range	**Unit A**	**Sec. 34**	**T 21S**	**R 33E**		
Lease Number:	**API No. 30-025-41364**					
County:	**Lea County**					
GPS:	**32.442006° N**			**103.552481° W**		
Surface Owner:	Fee					
Mineral Owner:	Fee					
Directions:	From the intersection of Hwy 62/180 and Hwy 176 turn Southeast and go appox. 14.15 miles turn left south and go apporx. 3.6 miles, turn right West 3.5miles turn left south and approx. 0.6miles turn right West and head .10miles and arrive on location.					

Release Data:	
Date Released:	4/21/2018
Type Release:	Oil
Source of Contamination:	Free Water Knock out
Fluid Released:	6.77 bbls
Fluids Recovered:	3 bbls

Official Communication:			
Name:	Callie Karrigan		Clair Gonzales
Company:	Marathon Oil		Tetra Tech
Address:	5555 San Felipe Street		901 West Wall
			Suite 100
City:	Carlsbad, NM 88220		Midland, Texas
Phone number:	(575)457-2621		(432) 687-8110
Fax:			
Email:	cnkarrigan@marathonoil.com		clair.gonzales@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	***0***	*179'*
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	***0***	*0*
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	***0***	*0*
Total Ranking Score:	***0***	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

January 8, 2019

Ms. Christina Hernandez
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

Re: Closure Request for the Marathon Oil Company, Battle #1H, Unit A, Section 34, Township 21 South, Range 33 East, Lea County, New Mexico. 1RP-5045.

Ms. Hernandez:

Tetra Tech, Inc. (Tetra Tech) was contacted by Marathon Oil Company (Marathon) to investigate and assess a release that occurred at the Battle #1H, Unit A, Section 34, Township 21 South, Range 33 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.442006º, W 103.552481º. The site location is shown in Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on April 21, 2018, and released approximately 6.77 barrels of crude oil due to failure of the free water knockout, releasing fluids down the flare line and out of the flare. The impacted area on the pad and lease road measures approximately 210' x 165' with possible overspray that migrated into the pasture measuring approximately 500' x 500'. Marathon performed a surficial scrape to recover the saturated soils located on the pad. All of the excavated material was hauled to proper disposal. The initial C-141 form is included in Appendix A.

Groundwater

No wells are listed within Section 34 in the New Mexico Office of the State Engineers database or the Geology and Groundwater Conditions in Southern Lea County, NM (Report 6). The nearest well is listed on USGS National Water Information System, in Section 28 1.68 miles northeast with a reported depth to groundwater of 179' below surface. The New Mexico Office of the State Engineers database list one well in Section 33 .95 miles East of the facility with a depth to groundwater of 555' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 250' and 275' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
901 West Wall, Suite 100, Midland, TX 79701
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

TETRA TECH

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On May 14, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of eleven (11) auger holes (AH-1 through AH-11) were installed in the spill footprint. Auger holes (AH-1, AH-2, AH-3, AH4, and AH-5) were installed to total depths ranging from 0.5' to 1.5' below surface on the pad area and adjacent to the flare stack. Auger holes (AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) were installed in the pasture with total sampling depths ranging from 1.0' to 2.0' below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, chloride by EPA method 300.0, and BTEX by EPA Method 8021B. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, the areas of auger holes (AH-1, AH-2, AH-3, AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) did not show benzene, total BTEX, or TPH concentrations above the RRALs. Additionally, the areas of auger holes (AH-1, AH-2, AH-4, AH-5, AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) showed chloride concentrations below the 600 mg/kg threshold.

The area of auger hole (AH-3) showed a chloride high of 10,600 mg/kg at a depth of 0-1' below surface. Additionally, the area of auger holes (AH-4, and AH-5) showed high TPH concentrations of 7,540 mg/kg and 5,290 mg/kg both at 0-0.5' below surface. No benzene or total BTEX concentrations above the RRALs was detected in these areas.

Remediation Activities

On November 13 through 19, 2018, Tetra Tech personnel were on site to supervise the excavation and remediation activities. Based on the field screening data performed during the remediation activities, the area of auger hole (AH-3) was excavated to 2.0'-3.0', and the area of auger holes (AH-4 and AH-5) were excavated to 1.0' below surface, as shown on Figure 4 and highlighted (green) on Table 1. Sidewall and bottom hole confirmation samples were collected to ensure proper removal of the impacted soils. The samples were submitted to the laboratory to be analyzed for TPH method 8015 extended, BTEX method 8021B, and chlorides by EPA method 300.0. The sampling results are summarized in Table 1. The excavation depths and sample locations are shown in Figure 4.

TETRA TECH

Referring to Table 1, none of the sidewall or bottom hole confirmation samples collected showed TPH, benzene, or total BTEX above the RRALs. Additionally, none of the confirmation samples showed chloride concentrations above 600 mg/kg, except North Sidewall 1, which showed a concentration of 752 mg/kg. The area was extended and re-sampled showing a concentration of 464 mg/kg. The excavated areas were backfilled with clean material to surface grade. Approximately 546 cubic yards of excavated material was transported for proper disposal.

Conclusion

Based on the soil assessment and remediation work performed at the site, Marathon Oil Company (Marathon) requests closure of this spill. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call at (432) 682-4559.

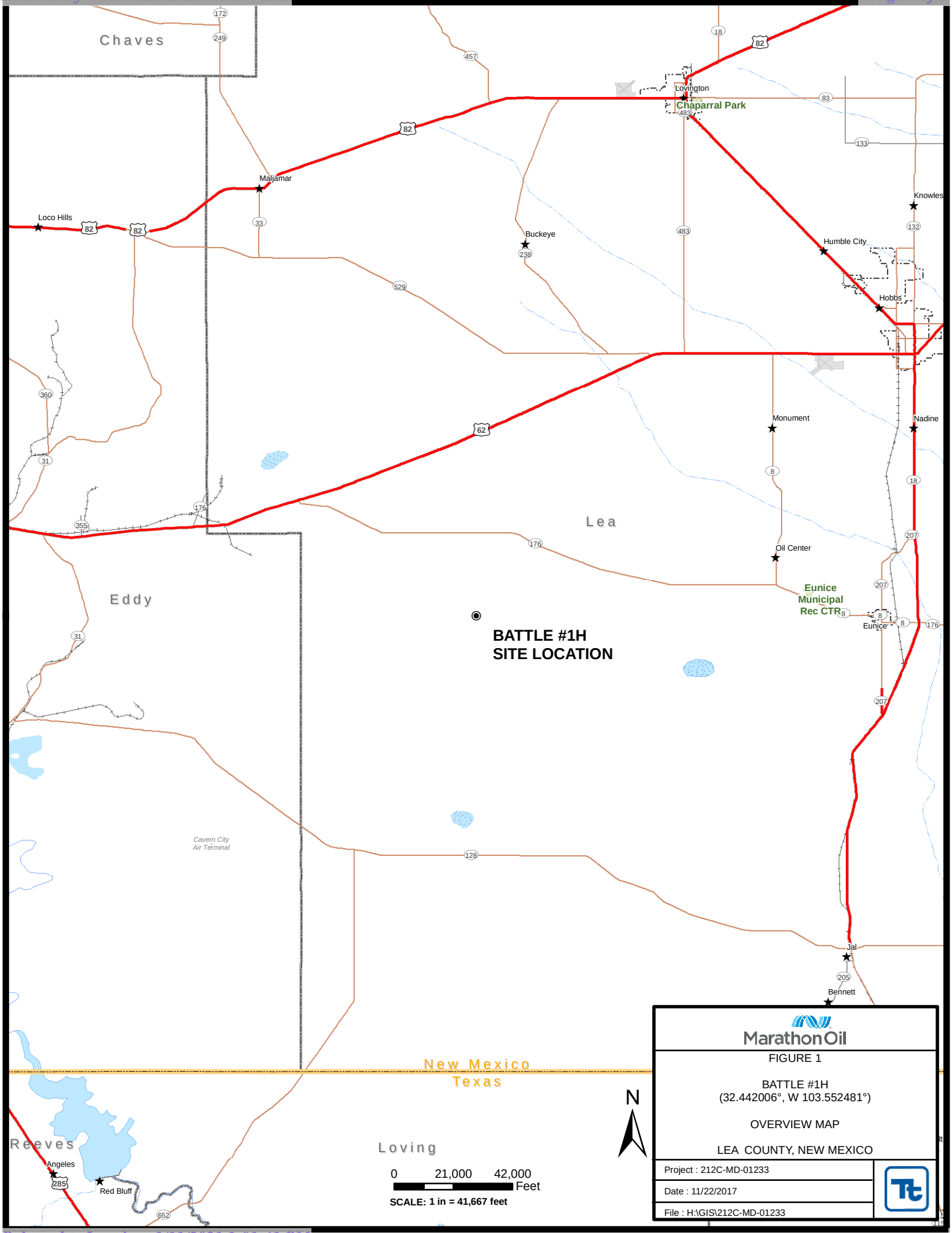
Respectfully submitted,
TETRA TECH

Clair Gonzales
Project Manager

Mike Carmona,
Geologist

cc: Shelly Tucker – BLM
Henryetta Price – BLM
Callie Karrigan - Marathon

Figures



MarathonOil

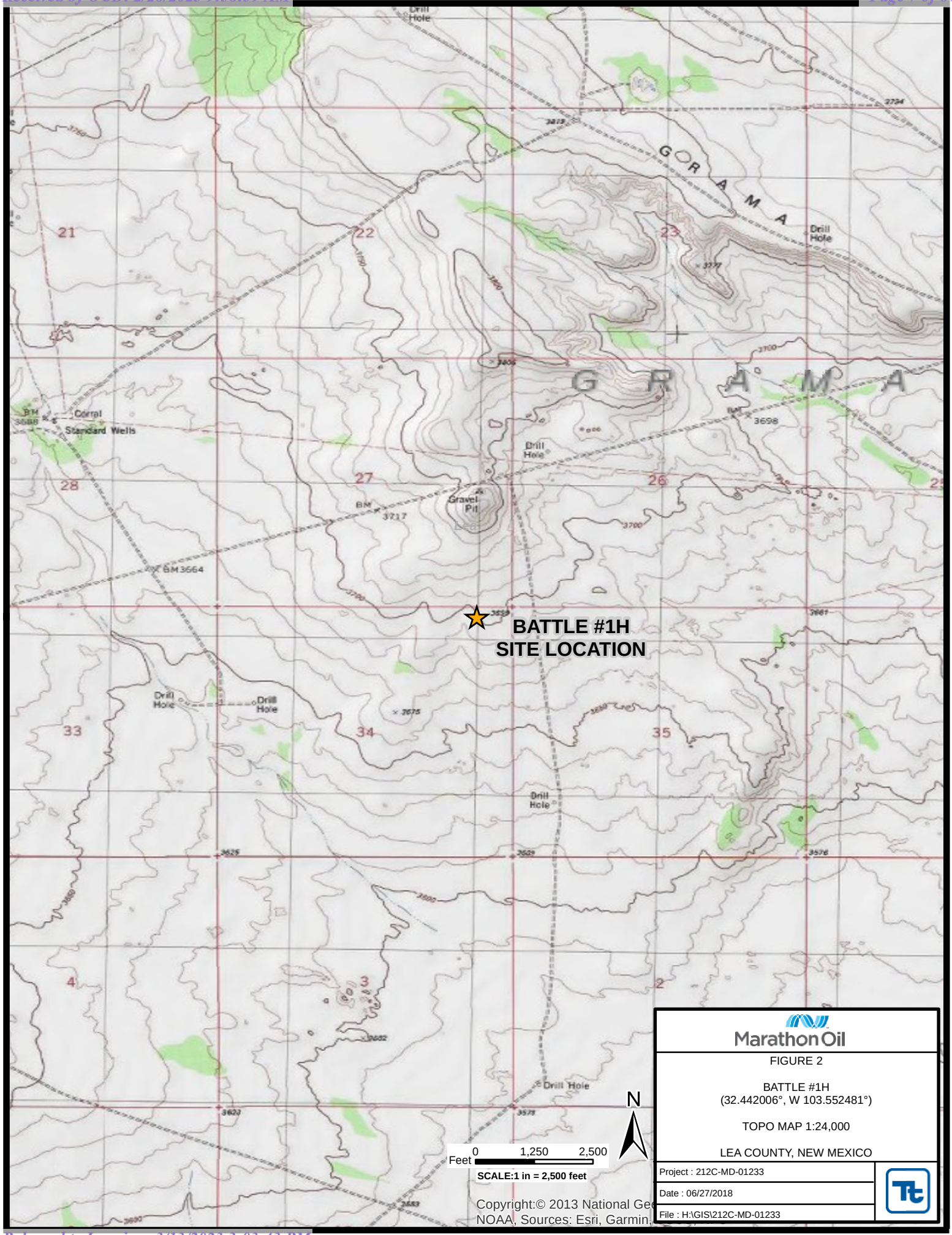
FIGURE 1

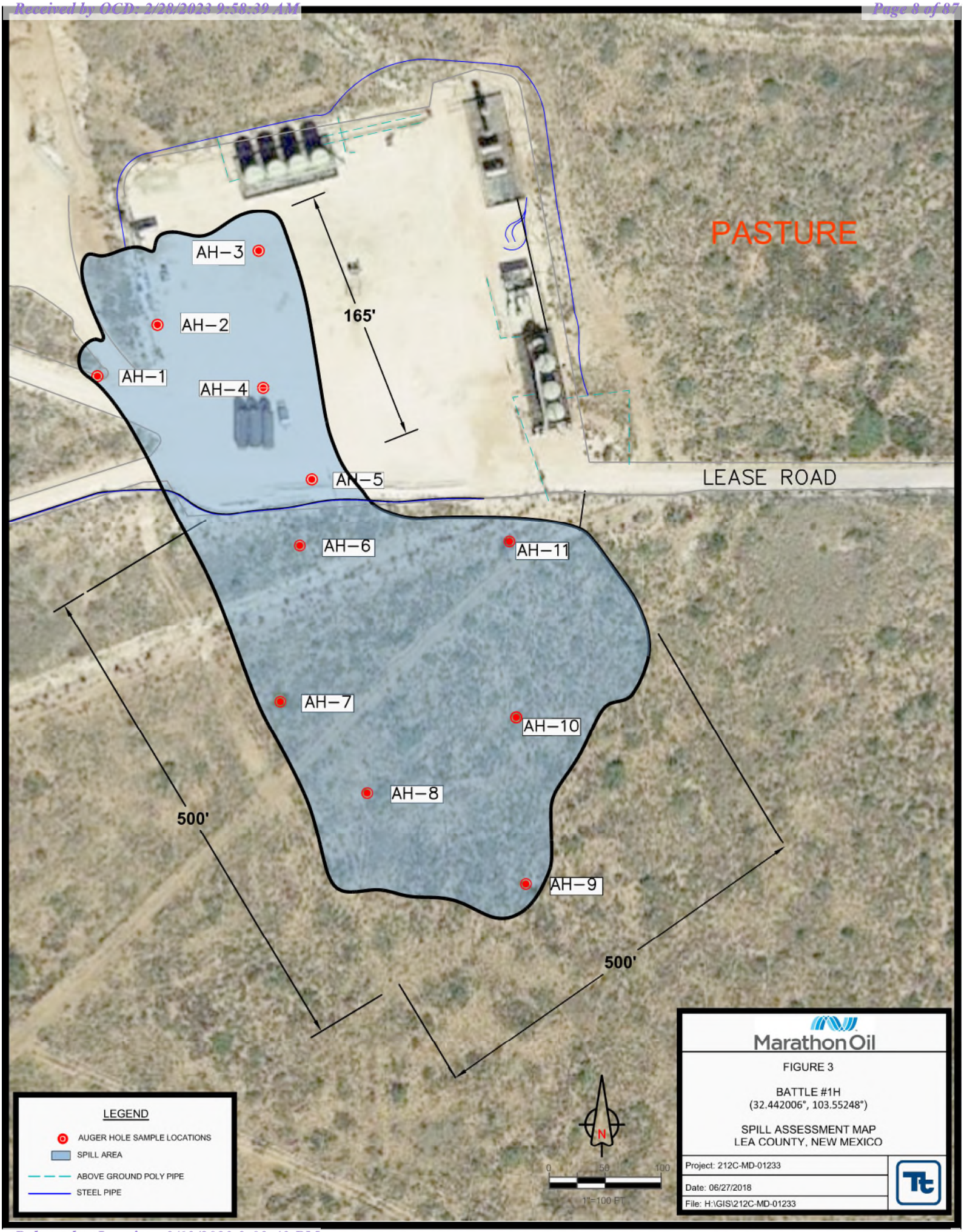
BATTLE #1H
(32.442006°, W 103.552481°)

OVERVIEW MAP

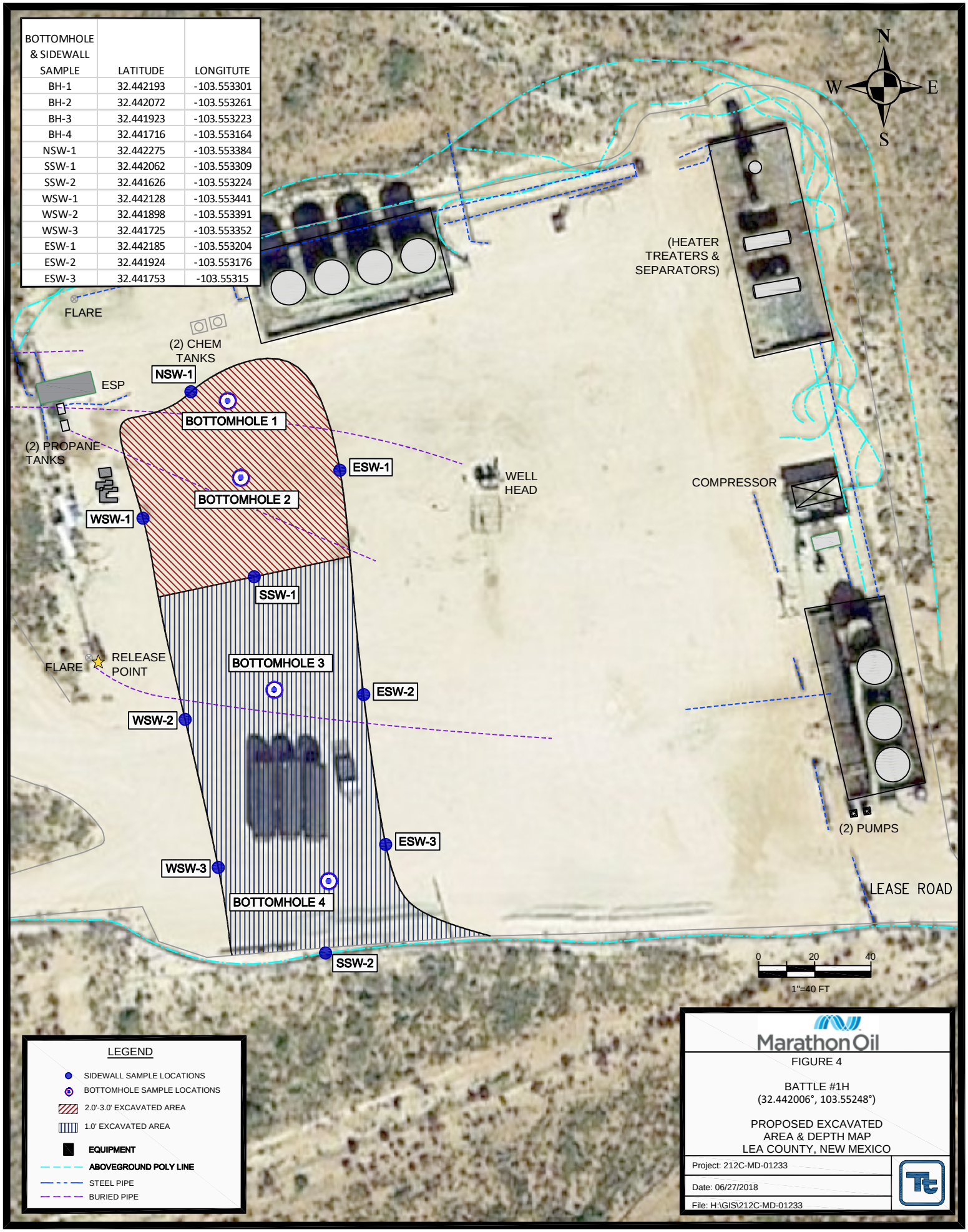
LEA COUNTY, NEW MEXICO

Project : 212C-MD-01233	
Date : 11/22/2017	
File : H:\GIS\212C-MD-01233	




PASTURE
LEASE ROAD
AH–1
AH–2
AH–3
AH–4
AH–5
AH–6
AH–7
AH–8
AH–9
AH–10
AH–11
165'
500'
500'
LEGEND
AUGER HOLE SAMPLE LOCATIONS
SPILL AREA
ABOVE GROUND POLY PIPE
STEEL PIPE
N
0
50
100
1"=100 FT
Marathon Oil
FIGURE 3
BATTLE #1H
(32.442006°, 103.55248°)
SPILL ASSESSMENT MAP
LEA COUNTY, NEW MEXICO
Project: 212C-MD-01233
Date: 06/27/2018
File: H:\GIS\212C-MD-01233

BOTTOMHOLE & SIDEWALL SAMPLE	LATITUDE	LONGITUTE
BH-1	32.442193	-103.553301
BH-2	32.442072	-103.553261
BH-3	32.441923	-103.553223
BH-4	32.441716	-103.553164
NSW-1	32.442275	-103.553384
SSW-1	32.442062	-103.553309
SSW-2	32.441626	-103.553224
WSW-1	32.442128	-103.553441
WSW-2	32.441898	-103.553391
WSW-3	32.441725	-103.553352
ESW-1	32.442185	-103.553204
ESW-2	32.441924	-103.553176
ESW-3	32.441753	-103.55315



LEGEND

- SIDEWALL SAMPLE LOCATIONS
- BOTTOMHOLE SAMPLE LOCATIONS
- 2.0'-3.0' EXCAVATED AREA
- 1.0' EXCAVATED AREA
- EQUIPMENT
- ABOVEGROUND POLY LINE
- STEEL PIPE
- BURIED PIPE

Marathon Oil

FIGURE 4

BATTLE #1H
(32.442006°, 103.55248°)

PROPOSED EXCAVATED AREA & DEPTH MAP
LEA COUNTY, NEW MEXICO

Project: 212C-MD-01233

Date: 06/27/2018

File: H:\GIS\212C-MD-01233

Tables

Table 1
Marathon Oil Company
Battle #1H
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	ORO	Total						
AH-1	5/14/2018	0-1	-	X		<14.9	665	88.2	753	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<4.98
	"	1-1.5	-	X		<15.0	172	23.9	196	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<4.95
AH-2	5/14/2018	0-6"	-	X		<15.0	827	157	984	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	86.8
AH-3	5/14/2018	0-1	-		X	<15.0	124	46.6	171	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	**10,600**
BH-1	11/19/2018	-	2-3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
BH-2	11/19/2018	-	2-3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	80.0
North Sidewall 1	11/19/2018	-	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	**752**
	11/26/2018	-	-	X		-	-	-	-	-	-	-	-	-	464
East Sidewall 1	11/19/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	272
West Sidewall 1	11/19/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
South Sidewall 1	11/19/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
AH-4	5/14/2018	0-6"	-		X	126	6,620	790	**7,540**	<0.00199	<0.00199	<0.00199	0.0164	0.0164	150
BH-3	11/20/2018	-	1.0'	X		<10.0	42.1	<10.0	42.1	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
East Sidewall 2	11/20/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	<16.0
West Sidewall 2	11/20/2018	-	-		X	199	6,470	1,210	**7,879**	<0.050	<0.050	0.770	4.93	5.70	144
	11/26/2018	-	-	X		31.0	3,680	714	4,425	-	-	-	-	-	-
AH-5	5/14/2018	0-6"	-		X	<74.9	4,600	688	**5,290**	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	355
BH-4	11/20/2018	-	1.0'	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
East Sidewall 3	11/20/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	80.0
West Sidewall 3	11/20/2018	-	-	X		<10.0	133	68.8	202	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
South Sidewall 2	11/20/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	48.0

Table 1
Marathon Oil Company
Battle #1H
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	ORO	Total						
AH-6	5/14/2018	0-1	-	X		<15.0	220	54.1	274	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.97
	"	1-1.5	-	X		<15.0	37.4	25.6	63.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<5.00
AH-7	5/14/2018	0-1	-	X		<14.9	18.8	<14.9	18.8	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<5.00
	"	1-1.5	-	X		<15.0	19.3	<15.0	19.3	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<4.90
AH-8	5/14/2018	0-1	-	X		15.4	35.5	<15.0	50.9	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.95
	"	1-1.5	-	X		<15.0	17.0	<15.0	17.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<4.91
AH-9	5/14/2018	0-1	-	X		<15.0	15.7	<15.0	15.7	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.96
	"	1-1.5	-	X		<15.0	16.9	<15.0	16.9	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<4.97
	"	1.5-2.0	-	X		<15.0	15.7	<15.0	15.7	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<5.00
AH-10	5/14/2018	0-1	-	X		<15.0	21.4	<15.0	21.4	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<5.00
	"	1-1.5	-	X		<15.0	15.6	<15.0	15.6	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<4.90
AH-11	5/14/2018	0-1	-	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	0.00479	0.00479	270
	"	1-1.5	-	X		<14.9	<14.9	<14.9	<14.9	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	109
	"	1.5-2.0	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	118

(-) Not Analyzed

BEB Below Excavation Bottom

Excavation Depths

Photos

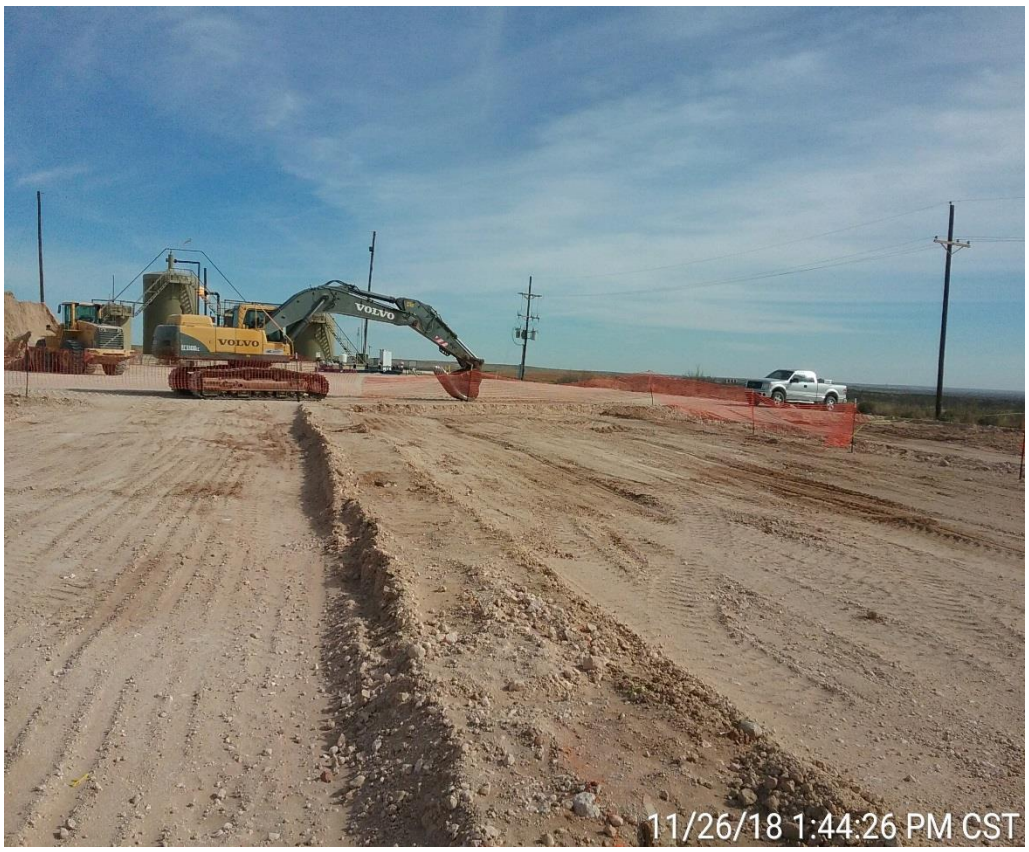
Marathon Oil Company
Battle #1H
Lea County, New Mexico

TETRA TECH

View West of Excavated Area of BH-1

View East of Excavated Area of BH-2

Marathon Oil Company
Battle #1H
Lea County, New Mexico



View East of Excavated Area of BH-3

View Southeast of Excavated Area of BH-4

Appendix A

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

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

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Marathon Oil Company	Contact Callie Karrigan
Address 5555 San Felipe Street, Houston, Texas 77056	Telephone No. 405-202-1028(cell) 575-297-0956 (office)
Facility Name Battle 1H	Facility Type Oil well

Surface Owner: fee	Mineral Owner: fee	API No. 30-025-41364

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
A	34	21S	33E	160	North	360	East	Lea

Latitude 32.442006 **Longitude** -103.552481 NAD83

NATURE OF RELEASE

Type of Release: oil	Volume of Release 6.77 bbls	Volume Recovered 3 bbls
Source of Release: Free water knock out	Date and Hour of Occurrence 04/21/2018 9:30 am	Date and Hour of Discovery 04/21/2018 9:30 am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu, Lea County	
By Whom? Callie Karrigan	Date and Hour 04/21/018 2:23 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*
Not applicable.

RECEIVED
By Olivia Yu at 10:24 am, May 07, 2018

Describe Cause of Problem and Remedial Action Taken.*
The Operator reported that the oil dump on the Battle 1H free water knock out (FWKO) was stuck closed, releasing fluids down the flare line and out the flare. Approximately 6.77 barrels of oil was released out the flare. No fire was reported. The released remained on location.

Describe Area Affected and Cleanup Action Taken.*
Standing fluids were recovered via vac truck and light scraping was performed to recover saturated soil. Tetratech will be assessing the release and affected area.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: *Callie Karrigan*	OIL CONSERVATION DIVISION	
Printed Name: Callie Karrigan	Approved by Environmental Specialist: OY	
Title: HES Professional	Approval Date: 5/7/2018	Expiration Date:
E-mail Address: cnkarrigan@marathonoil.com	Conditions of Approval: see attached directive	Attached ☑
Date: 05/6/2018 Phone: 405-202-1028 (cell) 575-297-0956 (office)		

* Attach Additional Sheets If Necessary

1RP-5045 nOY1812737111

pOY1812737505

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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # *(assigned by OCD)*
Contact mailing address	

Location of Release Source

Latitude _____ Longitude _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# *(if applicable)*

Unit Letter	Section	Township	Range	County

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

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) 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		

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Initial Response

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

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

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

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

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

Printed Name: _____ Title: _____

Signature: Callie Karrigan Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
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?	_____ (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.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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: _____ Title: _____

Signature: Callie Karrigan Date: _____

email: _____ Telephone: _____

OCD Only

Received by: Jocelyn Harimon Date: 03/13/2023

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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: _____ Title: _____

Signature: Callie Karrigan Date: _____

email: _____ Telephone: _____

OCD Only

Received by: Jocelyn Harimon Date: 03/13/2023

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: 03/13/2023

Printed Name: Jocelyn Harimon Title: Environmental Specialist

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Battle 1H
Lea County, New Mexico

20 South 33 East

6	5 325 278	4	3	2	1
7 Artesia	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24 +300
30	29	28	27	26	25
31	32	33	34	35	36

20 South 34 East

6	5	4 125	3	2	1
7	8	9	10	11	12
18	17 128 140	16	15	14 150	13
19	20	21	22	23	24 270
30	29	28	27	26	25
31	32	33	34 82	35	36

20 South 35 East

6 56 64	5 64	4	3	2	1
7	8	9	10	11	12 49
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31 65	32	33 89	34	35	36

21 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

21 South 33 East

6	5	4	3	2 79 100 107	1
7	8	9	10	11 150	12
18 143	17	16	15	14	13
19	20	21	22	23	24
30	29	28 179	27 572	26	25
31	32	33 555	34 Site	35	36

21 South 34 East

6	5	4 95	3	2	1
7	8 120	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28 140	27	26	25
31	32	33	34	35	36

22 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 382 350	13
19 (S) 280	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

22 South 33 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13 391
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

22 South 34 East

6	5	4	3	2	1
7	8	9	10	11 30	12 50
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y		Depth Well	Depth Water	Water Column
CP 00578		CP	LE		4	3	11	21S	33E	636674	3595445*		165	150	15
CP 00579		CP	LE		2	2	02	21S	33E	637438	3598269*		125	100	25
CP 00600 POD1		CP	LE		2	4	25	21S	33E	639152	3591054*		65		
CP 00601 POD1		CP	LE		2	1	28	21S	33E	633502	3591791*		223		
CP 00765 POD1		CP	LE		3	2	13	21S	33E	638698	3594668*		508		
CP 00766 POD1		CP	LE		3	2	13	21S	33E	638698	3594668*		510		
CP 00794 POD1		CP	LE	4	1	1	18	21S	33E	629976	3594865*		160		
CP 00795 POD1		CP	LE	4	1	1	18	21S	33E	629976	3594865*		170		
CP 00796 POD1		CP	LE	2	2	4	02	21S	33E	637548	3597564*		102		
CP 00797 POD1		CP	LE	1	2	4	02	21S	33E	637348	3597564*		110		
CP 00801 POD1		CP	LE	3	2	1	11	21S	33E	636555	3596549*		200		
CP 00802 POD1		CP	LE	3	3	2	02	21S	33E	637001	3598672		1154		
CP 00803 POD1		CP	LE	3	2	2	02	21S	33E	637337	3598168*		1100		
CP 00804 POD1		CP	LE	3	2	2	02	21S	33E	637337	3598168*		170		
CP 00854 POD1		CP	LE	1	1	2	33	21S	33E	633879	3590223		950	600	350
CP 01290 POD1		CP	LE		3	1	02	21S	33E	637114	3598855		1250	725	525
CP 01316 POD1		CP	LE	3	2	4	02	21S	33E	637432	3597709		1370		
CP 01317 POD1		CP	LE	1	3	2	02	21S	33E	636884	3598450		1250	1025	225
CP 01349 POD1		CP	LE	2	3	1	27	21S	33E	635304	3591576		1188	572	616
CP 01355 POD1		CP	LE	2	1	3	27	21S	33E	634773	3591061		1192	582	610
CP 01356 POD1		CP	LE	4	2	2	33	21S	33E	634560	3590014		1098	555	543
CP 01357 POD1		CP	LE	4	3	1	27	21S	33E	634782	3591347		1286	578	708
CP 01411 POD1		CP	LE		2	2	34	21S	33E	635968	3590386		1149		
CP 01411 POD2		CP	LE		1	2	34	21S	33E	635534	3590380		1125		

Average Depth to Water: **543 feet**

Minimum Depth: **100 feet**

Maximum Depth: **1025 feet**

Record Count: 24

PLSS Search:

Township: 21S **Range:** 33E

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

6/19/18 8:33 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Click to hide News Bulletins

- Please see news on new formats
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 322702103344001

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

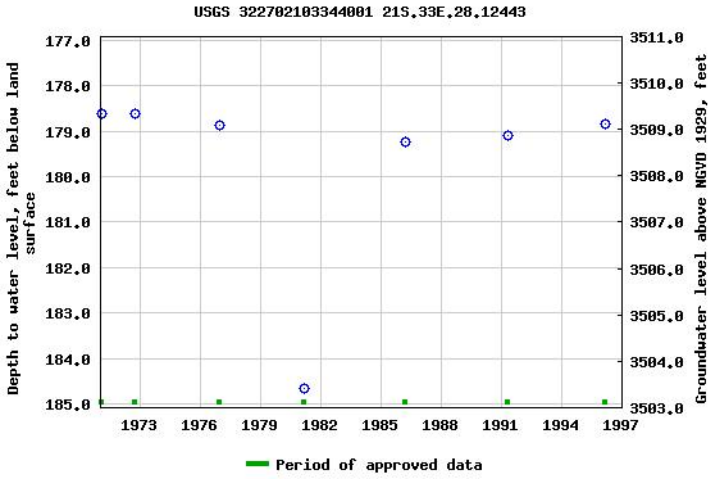
USGS 322702103344001 21S.33E.28.12443

Available data for this site: Groundwater: Field measurements GO

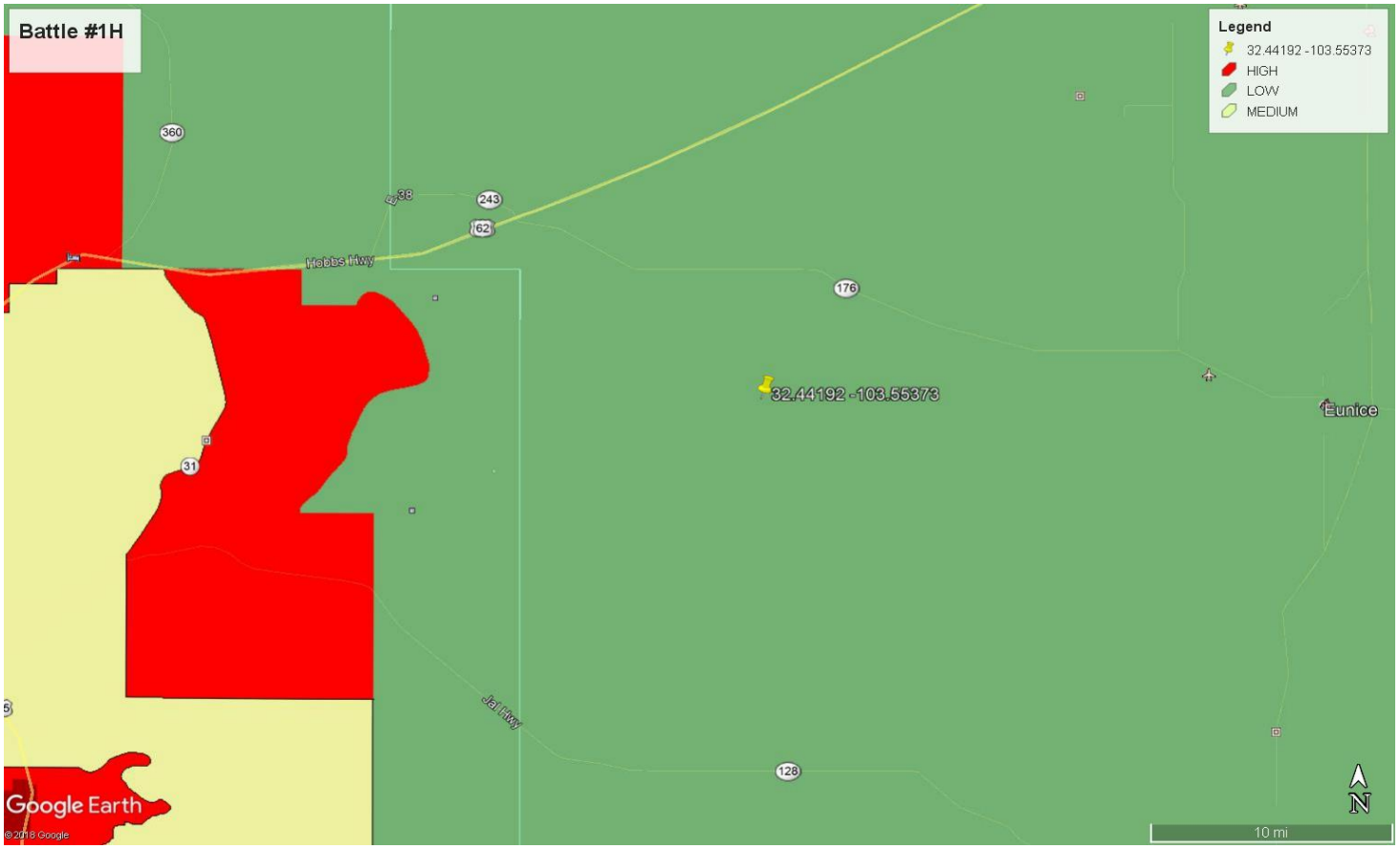
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°27'13", Longitude 103°34'42" NAD27
Land-surface elevation 3,688.00 feet above NGVD29
The depth of the well is 224 feet below land surface.
This well is completed in the Chinle Formation (231CHNL) local aquifer.

Output formats

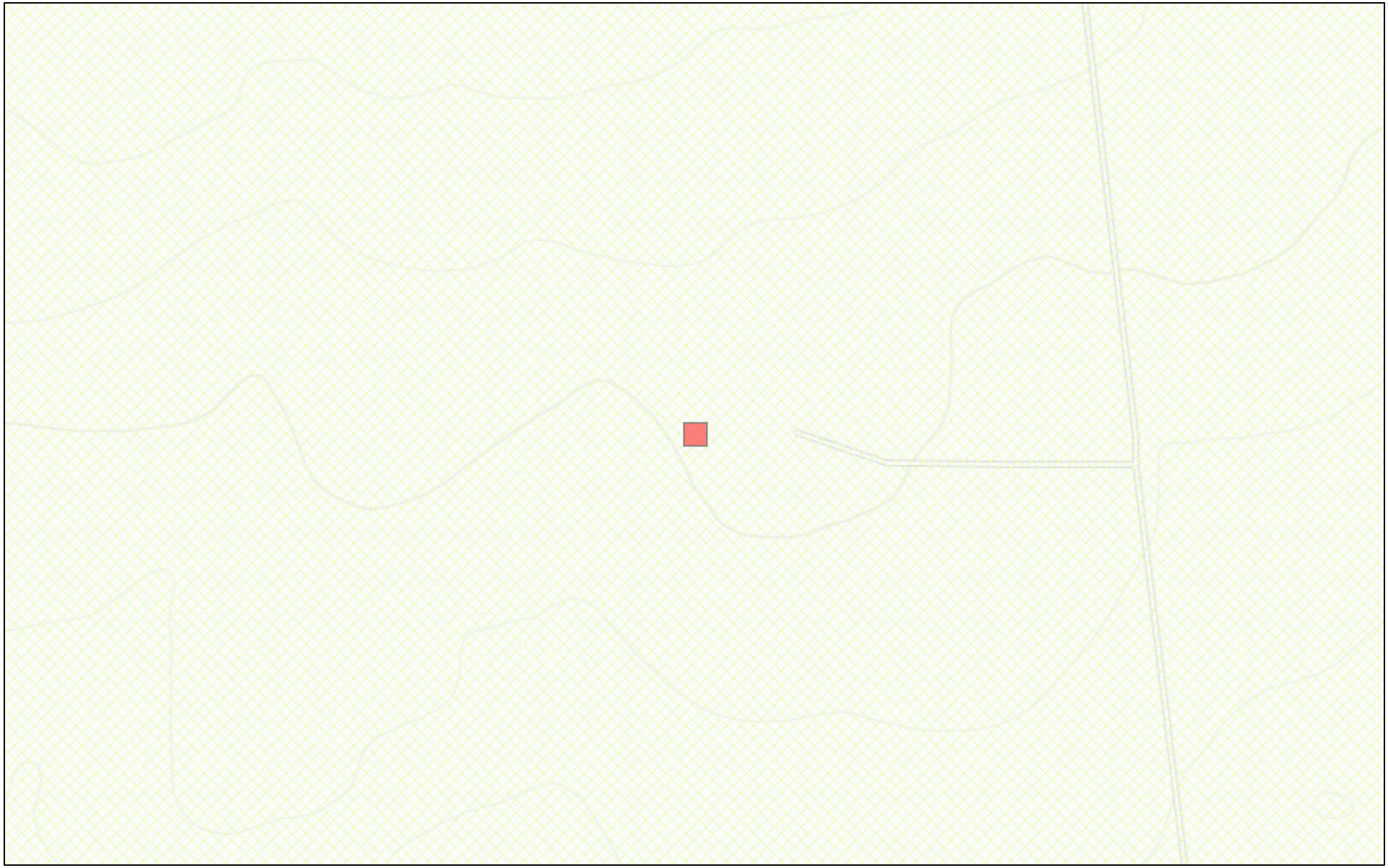
Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph


Battle #1H
Legend
32.44192 -103.55373
HIGH
LOW
MEDIUM
360
243
62
Hobbs Hwy
176
32.44192 -103.55373
Eunice
31
Jal Hwy
128
Google Earth
© 2018 Google
N
10 mi

New Mexico NFHL Data



December 14, 2018

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

FEMA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

Appendix C

Analytical Report 586572

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Marathon-Battle 1H

212C-MD-01233

25-MAY-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-25), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-17-16), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab Code: TX00158): Texas (T104704400-18-14)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

25-MAY-18

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **586572**
Marathon-Battle 1H
Project Address: Lea County, New Mexico

Ike Tavarez:

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) 586572. 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. 586572 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 586572

Tetra Tech- Midland, Midland, TX

Marathon-Battle 1H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH #1 (0-1')	S	05-14-18 00:00		586572-001
AH #1 (0-1.5')	S	05-14-18 00:00		586572-002
AH #2 (0-6')	S	05-14-18 00:00		586572-003
AH #3 (0-1')	S	05-14-18 00:00		586572-004
AH #4 (0-6")	S	05-14-18 00:00		586572-005
AH #5 (0-6")	S	05-14-18 00:00		586572-006
AH #6 (0-1')	S	05-14-18 00:00		586572-007
AH #6 (1-1.5')	S	05-14-18 00:00		586572-008
AH #7 (0-1')	S	05-14-18 00:00		586572-009
AH #7 (1-1.5')	S	05-14-18 00:00		586572-010
AH #8 (0-1')	S	05-14-18 00:00		586572-011
AH #8 (1-1.5')	S	05-14-18 00:00		586572-012
AH #9 (0-1')	S	05-14-18 00:00		586572-013
AH #9 (1-1.5')	S	05-14-18 00:00		586572-014
AH #9 (1.5-2')	S	05-14-18 00:00		586572-015
AH #10 (0-1')	S	05-14-18 00:00		586572-016
AH #10 (1-1.5')	S	05-14-18 00:00		586572-017
AH #11 (0-1')	S	05-14-18 00:00		586572-018
AH #11 (1-1.5')	S	05-14-18 00:00		586572-019
AH #11 (1.5-2')	S	05-14-18 00:00		586572-020

CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Marathon-Battle 1H

Project ID: *212C-MD-01233*
Work Order Number(s): *586572*

Report Date: *25-MAY-18*
Date Received: *05/18/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3051413 BTEX by EPA 8021B

Lab Sample ID 586572-002 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 586572-001, -002, -004, -005, -006, -007, -008, -009, -010, -011, -013, -014, -015, -016, -017, -018, -019.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3051424 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Lab Sample ID 586572-003 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 586572-003, -012, -020.

The Laboratory Control Sample for Toluene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analysis Summary 586572

Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
Contact: Ike Tavarez
Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
Report Date: 25-MAY-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	586572-001		586572-002		586572-003		586572-004		586572-005		586572-006	
	Field Id:	AH #1 (0-1')		AH #1 (0-1.5')		AH #2 (0-6')		AH #3 (0-1')		AH #4 (0-6")		AH #5 (0-6")	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00	
BTEX by EPA 8021B	***Extracted:***	May-24-18 12:00		May-24-18 12:00		May-24-18 17:15		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00	
	Analyzed:	May-24-18 15:09		May-24-18 12:45		May-25-18 06:32		May-24-18 13:03		May-24-18 13:22		May-24-18 13:40	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	<0.00199	0.00199	<0.00200	0.00200
Toluene		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	<0.00199	0.00199	<0.00200	0.00200
Ethylbenzene		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	<0.00199	0.00199	<0.00200	0.00200
m,p-Xylenes		<0.00398	0.00398	<0.00401	0.00401	<0.00403	0.00403	<0.00403	0.00403	0.00917	0.00398	<0.00399	0.00399
o-Xylene		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	0.00724	0.00199	<0.00200	0.00200
Total Xylenes		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	0.0164	0.00199	<0.00200	0.00200
Total BTEX		<0.00199	0.00199	<0.00200	0.00200	<0.00202	0.00202	<0.00202	0.00202	0.0164	0.00199	<0.00200	0.00200
Inorganic Anions by EPA 300/300.1	***Extracted:***	May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30	
	Analyzed:	May-22-18 19:09		May-22-18 19:27		May-22-18 19:33		May-22-18 19:39		May-22-18 19:45		May-22-18 20:03	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.98	4.98	<4.95	4.95	86.8	4.97	10600	99.6	150	4.91	355	4.97
TPH By SW8015 Mod	***Extracted:***	May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00	
	Analyzed:	May-24-18 10:07		May-24-18 10:26		May-24-18 11:19		May-24-18 11:37		May-24-18 11:55		May-24-18 12:13	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<14.9	14.9	<15.0	15.0	<15.0	15.0	<15.0	15.0	126	74.7	<74.9	74.9
Diesel Range Organics (DRO)		665	14.9	172	15.0	827	15.0	124	15.0	6620	74.7	4600	74.9
Oil Range Hydrocarbons (ORO)		88.2	14.9	23.9	15.0	157	15.0	46.6	15.0	790	74.7	688	74.9
Total TPH		753	14.9	196	15.0	984	15.0	171	15.0	7540	74.7	5290	74.9

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Kelsey Brooks
Project Manager

Final 1.000

Certificate of Analysis Summary 586572

Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
Contact: Ike Tavarez
Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
Report Date: 25-MAY-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	586572-007		586572-008		586572-009		586572-010		586572-011		586572-012	
	Field Id:	AH #6 (0-1')		AH #6 (1-1.5')		AH #7 (0-1')		AH #7 (1-1.5')		AH #8 (0-1')		AH #8 (1-1.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00	
BTEX by EPA 8021B	***Extracted:***	May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 17:15	
	Analyzed:	May-24-18 13:58		May-24-18 14:14		May-24-18 14:32		May-24-18 14:51		May-24-18 16:07		May-25-18 10:28	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
Toluene		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
Ethylbenzene		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
m,p-Xylenes		<0.00402	0.00402	<0.00402	0.00402	<0.00397	0.00397	<0.00398	0.00398	<0.00402	0.00402	<0.00404	0.00404
o-Xylene		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
Total Xylenes		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
Total BTEX		<0.00201	0.00201	<0.00201	0.00201	<0.00198	0.00198	<0.00199	0.00199	<0.00201	0.00201	<0.00202	0.00202
Inorganic Anions by EPA 300/300.1	***Extracted:***	May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30	
	Analyzed:	May-22-18 20:09		May-22-18 20:15		May-22-18 20:21		May-22-18 20:27		May-22-18 20:33		May-22-18 20:51	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.97	4.97	<5.00	5.00	<5.00	5.00	<4.90	4.90	<4.95	4.95	<4.91	4.91
TPH By SW8015 Mod	***Extracted:***	May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00	
	Analyzed:	May-24-18 12:31		May-24-18 12:50		May-24-18 13:08		May-24-18 13:26		May-24-18 14:20		May-24-18 14:38	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	15.4	15.0	<15.0	15.0
Diesel Range Organics (DRO)		220	15.0	37.4	15.0	18.8	14.9	19.3	15.0	35.5	15.0	17.0	15.0
Oil Range Hydrocarbons (ORO)		54.1	15.0	25.6	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0	<15.0	15.0
Total TPH		274	15.0	63.0	15.0	18.8	14.9	19.3	15.0	50.9	15.0	17.0	15.0

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Kelsey Brooks
Project Manager

Final 1.000

Certificate of Analysis Summary 586572

Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
Contact: Ike Tavarez
Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
Report Date: 25-MAY-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	586572-013		586572-014		586572-015		586572-016		586572-017		586572-018	
	Field Id:	AH #9 (0-1')		AH #9 (1-1.5')		AH #9 (1.5-2')		AH #10 (0-1')		AH #10 (1-1.5')		AH #11 (0-1')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00		May-14-18 00:00	
BTEX by EPA 8021B	***Extracted:***	May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00		May-24-18 12:00	
	Analyzed:	May-24-18 16:44		May-24-18 17:15		May-24-18 17:33		May-24-18 17:51		May-24-18 18:10		May-24-18 18:28	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00199	0.00199
Toluene		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00199	0.00199
Ethylbenzene		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00199	0.00199
m,p-Xylenes		<0.00402	0.00402	<0.00397	0.00397	<0.00399	0.00399	<0.00401	0.00401	<0.00403	0.00403	0.00479	0.00398
o-Xylene		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00199	0.00199
Total Xylenes		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	0.00479	0.00199
Total BTEX		<0.00201	0.00201	<0.00198	0.00198	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	0.00479	0.00199
Inorganic Anions by EPA 300/300.1	***Extracted:***	May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30		May-22-18 16:30	
	Analyzed:	May-22-18 20:57		May-22-18 21:15		May-22-18 21:21		May-22-18 21:26		May-22-18 21:32		May-22-18 21:38	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.96	4.96	<4.97	4.97	<5.00	5.00	<5.00	5.00	<4.90	4.90	270	4.99
TPH By SW8015 Mod	***Extracted:***	May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00		May-24-18 07:00	
	Analyzed:	May-24-18 14:56		May-24-18 15:14		May-24-18 15:33		May-24-18 15:51		May-24-18 16:09		May-24-18 16:27	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Diesel Range Organics (DRO)		15.7	15.0	16.9	15.0	15.7	15.0	21.4	15.0	15.6	15.0	<15.0	15.0
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Total TPH		15.7	15.0	16.9	15.0	15.7	15.0	21.4	15.0	15.6	15.0	<15.0	15.0

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Kelsey Brooks
Project Manager

Certificate of Analysis Summary 586572

Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
Contact: Ike Tavarez
Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
Report Date: 25-MAY-18
Project Manager: Kelsey Brooks

Analysis Requested									
	Lab Id:	586572-019		586572-020					
	Field Id:	AH #11 (1-1.5')		AH #11 (1.5-2')					
	Depth:								
	Matrix:	SOIL		SOIL					
	Sampled:	May-14-18 00:00		May-14-18 00:00					
BTEX by EPA 8021B	***Extracted:***	May-24-18 12:00		May-24-18 17:15					
	Analyzed:	May-24-18 18:46		May-25-18 06:50					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Benzene		<0.00198	0.00198	<0.00200	0.00200				
Toluene		<0.00198	0.00198	<0.00200	0.00200				
Ethylbenzene		<0.00198	0.00198	<0.00200	0.00200				
m,p-Xylenes		<0.00397	0.00397	<0.00401	0.00401				
o-Xylene		<0.00198	0.00198	<0.00200	0.00200				
Total Xylenes		<0.00198	0.00198	<0.00200	0.00200				
Total BTEX		<0.00198	0.00198	<0.00200	0.00200				
Inorganic Anions by EPA 300/300.1	***Extracted:***	May-22-18 16:30		May-22-18 16:30					
	Analyzed:	May-22-18 21:44		May-22-18 21:50					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Chloride		109	4.90	118	4.95				
TPH By SW8015 Mod	***Extracted:***	May-24-18 07:00		May-24-18 07:00					
	Analyzed:	May-24-18 16:45		May-24-18 17:03					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)		<14.9	14.9	<15.0	15.0				
Diesel Range Organics (DRO)		<14.9	14.9	<15.0	15.0				
Oil Range Hydrocarbons (ORO)		<14.9	14.9	<15.0	15.0				
Total TPH		<14.9	14.9	<15.0	15.0				

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Kelsey Brooks
Project Manager

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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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 586572-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 10:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.4	99.6	96	70-135	
o-Terphenyl	51.9	49.8	104	70-135	

Lab Batch #: 3051427 **Sample:** 586572-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 10:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.0	99.8	93	70-135	
o-Terphenyl	48.1	49.9	96	70-135	

Lab Batch #: 3051427 **Sample:** 586572-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:19

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.7	100	70-135	
o-Terphenyl	61.3	49.9	123	70-135	

Lab Batch #: 3051427 **Sample:** 586572-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:37

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	99.7	104	70-135	
o-Terphenyl	54.2	49.9	109	70-135	

Lab Batch #: 3051427 **Sample:** 586572-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:55

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	99.6	121	70-135	
o-Terphenyl	53.1	49.8	107	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 586572-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 12:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.9	101	70-135	
o-Terphenyl	51.8	50.0	104	70-135	

Lab Batch #: 3051427 **Sample:** 586572-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 12:31

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.6	99.8	99	70-135	
o-Terphenyl	51.3	49.9	103	70-135	

Lab Batch #: 3051413 **Sample:** 586572-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 12:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0243	0.0300	81	70-130	
4-Bromofluorobenzene	0.0257	0.0300	86	70-130	

Lab Batch #: 3051427 **Sample:** 586572-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 12:50

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	56.2	50.0	112	70-135	

Lab Batch #: 3051413 **Sample:** 586572-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	70-130	
4-Bromofluorobenzene	0.0349	0.0300	116	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 586572-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:08

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.3	99.6	100	70-135	
o-Terphenyl	47.5	49.8	95	70-135	

Lab Batch #: 3051413 **Sample:** 586572-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	70-130	
4-Bromofluorobenzene	0.0308	0.0300	103	70-130	

Lab Batch #: 3051427 **Sample:** 586572-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.7	106	70-135	
o-Terphenyl	52.0	49.9	104	70-135	

Lab Batch #: 3051413 **Sample:** 586572-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	70-130	
4-Bromofluorobenzene	0.0296	0.0300	99	70-130	

Lab Batch #: 3051413 **Sample:** 586572-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 13:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	70-130	
4-Bromofluorobenzene	0.0316	0.0300	105	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413 **Sample:** 586572-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0347	0.0300	116	70-130	
4-Bromofluorobenzene	0.0285	0.0300	95	70-130	

Lab Batch #: 3051427 **Sample:** 586572-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:20

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.8	110	70-135	
o-Terphenyl	52.0	49.9	104	70-135	

Lab Batch #: 3051413 **Sample:** 586572-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	70-130	
4-Bromofluorobenzene	0.0352	0.0300	117	70-130	

Lab Batch #: 3051427 **Sample:** 586572-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.7	109	70-135	
o-Terphenyl	52.7	49.9	106	70-135	

Lab Batch #: 3051413 **Sample:** 586572-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	70-130	
4-Bromofluorobenzene	0.0305	0.0300	102	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 586572-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 14:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.9	107	70-135	
o-Terphenyl	51.7	50.0	103	70-135	

Lab Batch #: 3051413 **Sample:** 586572-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 15:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0280	0.0300	93	70-130	

Lab Batch #: 3051427 **Sample:** 586572-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 15:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	100	105	70-135	
o-Terphenyl	53.4	50.0	107	70-135	

Lab Batch #: 3051427 **Sample:** 586572-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 15:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.8	100	70-135	
o-Terphenyl	51.3	49.9	103	70-135	

Lab Batch #: 3051427 **Sample:** 586572-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 15:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	99.8	103	70-135	
o-Terphenyl	49.4	49.9	99	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413 **Sample:** 586572-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 16:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0259	0.0300	86	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	70-130	

Lab Batch #: 3051427 **Sample:** 586572-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 16:09

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.7	108	70-135	
o-Terphenyl	53.4	49.9	107	70-135	

Lab Batch #: 3051427 **Sample:** 586572-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 16:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.9	111	70-135	
o-Terphenyl	54.2	50.0	108	70-135	

Lab Batch #: 3051413 **Sample:** 586572-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 16:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0307	0.0300	102	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3051427 **Sample:** 586572-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 16:45

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.6	108	70-135	
o-Terphenyl	54.0	49.8	108	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 586572-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 17:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.9	99.7	100	70-135	
o-Terphenyl	49.4	49.9	99	70-135	

Lab Batch #: 3051413 **Sample:** 586572-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 17:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	70-130	
4-Bromofluorobenzene	0.0244	0.0300	81	70-130	

Lab Batch #: 3051413 **Sample:** 586572-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 17:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	70-130	
4-Bromofluorobenzene	0.0317	0.0300	106	70-130	

Lab Batch #: 3051413 **Sample:** 586572-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 17:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	70-130	
4-Bromofluorobenzene	0.0235	0.0300	78	70-130	

Lab Batch #: 3051413 **Sample:** 586572-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 18:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0329	0.0300	110	70-130	
4-Bromofluorobenzene	0.0331	0.0300	110	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413 **Sample:** 586572-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 18:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	70-130	
4-Bromofluorobenzene	0.0278	0.0300	93	70-130	

Lab Batch #: 3051413 **Sample:** 586572-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 18:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0259	0.0300	86	70-130	
4-Bromofluorobenzene	0.0296	0.0300	99	70-130	

Lab Batch #: 3051424 **Sample:** 586572-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/25/18 06:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	70-130	
4-Bromofluorobenzene	0.0295	0.0300	98	70-130	

Lab Batch #: 3051424 **Sample:** 586572-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/25/18 06:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	70-130	
4-Bromofluorobenzene	0.0318	0.0300	106	70-130	

Lab Batch #: 3051424 **Sample:** 586572-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/25/18 10:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	70-130	
4-Bromofluorobenzene	0.0326	0.0300	109	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427 **Sample:** 7655477-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 09:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	100	114	70-135	
o-Terphenyl	59.6	50.0	119	70-135	

Lab Batch #: 3051413 **Sample:** 7655456-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 12:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	70-130	
4-Bromofluorobenzene	0.0218	0.0300	73	70-130	

Lab Batch #: 3051424 **Sample:** 7655460-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/25/18 06:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	70-130	
4-Bromofluorobenzene	0.0241	0.0300	80	70-130	

Lab Batch #: 3051427 **Sample:** 7655477-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 09:31

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	55.0	50.0	110	70-135	

Lab Batch #: 3051413 **Sample:** 7655456-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 10:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	70-130	
4-Bromofluorobenzene	0.0291	0.0300	97	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051424 **Sample:** 7655460-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/25/18 04:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	70-130	
4-Bromofluorobenzene	0.0316	0.0300	105	70-130	

Lab Batch #: 3051427 **Sample:** 7655477-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 09:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	130	100	130	70-135	
o-Terphenyl	63.8	50.0	128	70-135	

Lab Batch #: 3051413 **Sample:** 7655456-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/24/18 11:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	70-130	
4-Bromofluorobenzene	0.0353	0.0300	118	70-130	

Lab Batch #: 3051424 **Sample:** 7655460-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/25/18 05:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	70-130	
4-Bromofluorobenzene	0.0281	0.0300	94	70-130	

Lab Batch #: 3051427 **Sample:** 586572-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 10:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	99.9	126	70-135	
o-Terphenyl	57.3	50.0	115	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413 **Sample:** 586572-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3051424 **Sample:** 586572-003 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/25/18 05:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	70-130	
4-Bromofluorobenzene	0.0306	0.0300	102	70-130	

Lab Batch #: 3051427 **Sample:** 586572-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	99.8	127	70-135	
o-Terphenyl	55.0	49.9	110	70-135	

Lab Batch #: 3051413 **Sample:** 586572-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/24/18 11:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0226	0.0300	75	70-130	
4-Bromofluorobenzene	0.0244	0.0300	81	70-130	

Lab Batch #: 3051424 **Sample:** 586572-003 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/25/18 05:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	70-130	
4-Bromofluorobenzene	0.0323	0.0300	108	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.

BS / BSD Recoveries

Project Name: Marathon-Battle 1H

Work Order #: 586572 **Project ID:** 212C-MD-01233

Analyst: ALJ **Date Prepared:** 05/24/2018 **Date Analyzed:** 05/24/2018

Lab Batch ID: 3051413 **Sample:** 7655456-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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	<0.00202	0.101	0.106	105	0.100	0.0937	94	12	70-130	35	
Toluene	<0.00202	0.101	0.108	107	0.100	0.0922	92	16	70-130	35	
Ethylbenzene	<0.00202	0.101	0.106	105	0.100	0.0948	95	11	70-130	35	
m,p-Xylenes	<0.00403	0.202	0.225	111	0.201	0.203	101	10	70-130	35	
o-Xylene	<0.00202	0.101	0.113	112	0.100	0.103	103	9	70-130	35	

Analyst: ALJ **Date Prepared:** 05/24/2018 **Date Analyzed:** 05/25/2018

Lab Batch ID: 3051424 **Sample:** 7655460-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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	<0.00199	0.0994	0.0945	95	0.0996	0.0856	86	10	70-130	35	
Toluene	<0.00199	0.0994	0.0928	93	0.0996	0.0826	83	12	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0933	94	0.0996	0.0843	85	10	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.197	99	0.199	0.179	90	10	70-130	35	
o-Xylene	<0.00199	0.0994	0.101	102	0.0996	0.0946	95	7	70-130	35	

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: Marathon-Battle 1H

Work Order #: 586572 **Project ID:** 212C-MD-01233

Analyst: SCM **Date Prepared:** 05/22/2018 **Date Analyzed:** 05/22/2018

Lab Batch ID: 3051035 **Sample:** 7645262-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	<5.00	250	232	93	250	232	93	0	90-110	20	

Analyst: ARM **Date Prepared:** 05/24/2018 **Date Analyzed:** 05/24/2018

Lab Batch ID: 3051427 **Sample:** 7655477-1-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	909	91	1000	1060	106	15	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1010	101	1000	1200	120	17	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: Marathon-Battle 1H

Work Order # : 586572 **Project ID:** 212C-MD-01233

Lab Batch ID: 3051413 **QC- Sample ID:** 586572-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/24/2018 **Date Prepared:** 05/24/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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	<0.00200	0.0998	0.0501	50	0.100	0.0593	59	17	70-130	35	X
Toluene	<0.00200	0.0998	0.0442	44	0.100	0.0577	58	26	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0446	45	0.100	0.0545	55	20	70-130	35	X
m,p-Xylenes	<0.00399	0.200	0.0878	44	0.200	0.116	58	28	70-130	35	X
o-Xylene	<0.00200	0.0998	0.0438	44	0.100	0.0599	60	31	70-130	35	X

Lab Batch ID: 3051424 **QC- Sample ID:** 586572-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/25/2018 **Date Prepared:** 05/24/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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	<0.00201	0.100	0.0778	78	0.101	0.0787	78	1	70-130	35	
Toluene	<0.00201	0.100	0.0672	67	0.101	0.0679	67	1	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0581	58	0.101	0.0566	56	3	70-130	35	X
m,p-Xylenes	<0.00402	0.201	0.119	59	0.202	0.118	58	1	70-130	35	X
o-Xylene	<0.00201	0.100	0.0582	58	0.101	0.0585	58	1	70-130	35	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: Marathon-Battle 1H

Work Order # : 586572 **Project ID:** 212C-MD-01233

Lab Batch ID: 3051035 **QC- Sample ID:** 586572-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/22/2018 **Date Prepared:** 05/22/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	<4.98	249	250	100	249	249	100	0	90-110	20	

Lab Batch ID: 3051035 **QC- Sample ID:** 586572-011 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/22/2018 **Date Prepared:** 05/22/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	<4.95	248	232	94	248	235	95	1	90-110	20	

Lab Batch ID: 3051427 **QC- Sample ID:** 586572-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/24/2018 **Date Prepared:** 05/24/2018 **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	999	967	97	998	923	92	5	70-135	20	
Diesel Range Organics (DRO)	172	999	1270	110	998	1140	97	11	70-135	20	

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.

Analysis Request of Chain of Custody Record

586572

Page 1 of 2

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: Marathon	**Site Manager:** Ike Tavarez
Project Name: Battle 1H	
Project Location: (county, state) Lea County, New Mexico	**Project #:** 212C-MD-01233
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco Lab	**Sampler Signature:** Mike Carmona
Comments:	

ANALYSIS REQUEST

(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None		# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				
	AH #1 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #1 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #2 (0-6")	5/14/2018			X				X			1	N	X		X												X						
	AH #3 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #4 (0-6")	5/14/2018			X				X			1	N	X		X												X						
	AH # 5 (0-6")	5/14/2018			X				X			1	N	X		X												X						
	AH #6 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #6 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #7 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #7 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						

Final 1.000

Hold

Page 25 of 27

Relinquished by:	Date: 5/14/18	Time: 1:30	Received by:
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

Received by: Date: 5/14/18 Time: 1320

Date: Time:

Date: Time:

LAB USE ONLY

Sample Temperature 2.6 RS

REMARKS:

- ☐ STANDARD
- ☐ RUSH: Same Day 24 hr 48 hr 72 hr
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

Analysis Request of Chain of Custody Record

586572 Page 2 of 2

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: Marathon	Site Manager: Ike Tavarez
Project Name: Battle 1H	
Project Location: (county, state) Lea County, New Mexico	Project #: 212C-MD-01233
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco Lab	Sampler Signature: Mike Carmona
Comments: Bill Tetra Tech -	

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None		# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	AH #8 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #8 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #9 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #9 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #9 (1.5-2')	5/14/2018			X				X			1	N															X						X
	AH #10 (0-1')	5/14/2018			X				X			1	N															X						
	AH #10 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #11 (0-1')	5/14/2018			X				X			1	N	X		X												X						
	AH #11 (1-1.5')	5/14/2018			X				X			1	N	X		X												X						
	AH #11 (1.5-2')	5/14/2018			X				X			1	N	X		X												X						

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	5/15/16	1:30	[signature]		1330
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

ORIGINAL COPY

LAB USE ONLY

Sample Temperature 2.6 RB

REMARKS:

- ☐ STANDARD
- ☐ RUSH: Same Day 24 hr 48 hr 72 hr
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

Final 1.000

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 05/18/2018 01:30:00 PM

Work Order #: 586572

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)?	2.6
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#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)?	**N/A**
#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: 05/18/2018

Brianna Teel

Checklist reviewed by: Kelsey Brooks Date: 05/21/2018

Kelsey Brooks

CARDINAL Laboratories

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

November 20, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BATTLE #1 H

Enclosed are the results of analyses for samples received by the laboratory on 11/19/18 16:24.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: BH-1 (H803380-01)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	11/20/2018	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	11/20/2018	ND	188	93.9	200	10.6	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	168	84.0	200	7.69	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					
Total TPH C6-C28	<10.0	10.0	11/20/2018	ND	356	88.9	400	9.26	

Surrogate: 1-Chlorooctane *79.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *78.4 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: BH-2 (H803380-02)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *73.3-129*

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	11/20/2018	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	11/20/2018	ND	188	93.9	200	10.6	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	168	84.0	200	7.69	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					
Total TPH C6-C28	<10.0	10.0	11/20/2018	ND	356	88.9	400	9.26	

Surrogate: 1-Chlorooctane *79.5 %* *41-142*

Surrogate: 1-Chlorooctadecane *78.4 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: NORTH WALL 1 (H803380-03)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**752**	16.0	11/20/2018	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	11/20/2018	ND	188	93.9	200	10.6	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	168	84.0	200	7.69	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					
Total TPH C6-C28	<10.0	10.0	11/20/2018	ND	356	88.9	400	9.26	

Surrogate: 1-Chlorooctane *87.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *86.3 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: EAST WALL 1 (H803380-04)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**272**	16.0	11/20/2018	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	11/20/2018	ND	188	93.9	200	10.6	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	168	84.0	200	7.69	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					
Total TPH C6-C28	<10.0	10.0	11/20/2018	ND	356	88.9	400	9.26	

Surrogate: 1-Chlorooctane *87.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *89.0 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: WEST WALL 1 (H803380-05)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	11/20/2018	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	11/20/2018	ND	173	86.5	200	8.40	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	196	98.1	200	6.09	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					

Surrogate: 1-Chlorooctane *85.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *84.1 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/19/2018	Sampling Date:	11/19/2018
Reported:	11/20/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120-MD-01233	Sample Received By:	Jodi Henson
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: SOUTH WALL 1 (H803380-06)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/20/2018	ND	2.33	116	2.00	7.76	
Toluene*	<0.050	0.050	11/20/2018	ND	2.25	113	2.00	7.65	
Ethylbenzene*	<0.050	0.050	11/20/2018	ND	2.17	108	2.00	6.94	
Total Xylenes*	<0.150	0.150	11/20/2018	ND	6.79	113	6.00	6.28	
Total BTEX	<0.300	0.300	11/20/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	11/20/2018	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	11/20/2018	ND	173	86.5	200	8.40	
DRO >C10-C28*	<10.0	10.0	11/20/2018	ND	196	98.1	200	6.09	
EXT DRO >C28-C36	<10.0	10.0	11/20/2018	ND					

Surrogate: 1-Chlorooctane *86.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *86.1 %* *37.6-147*

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

CARDINAL Laboratories

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

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Tetra Tech	**BILL TO**
Project Manager: Clair Gonzales	P.O. #:
Address: 901 W. Wall St.	Company: Tetra Tech
City: Midland State: TX Zip: 79701	Attn: Clair Gonzales
Phone #: 432-260-8634 Fax #:	Address: 901 W. Wall St.
Project #: 212C-MD-01233 Project Owner: Marathon Oil	City: Midland
Project Name: Baxtle #1 H	State: TX Zip: 79701
Project Location: Lea Co., NM	Phone #: 432-260-8634
Sampler Name: Stephen Reyes	Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8021B	TPH 8015M (GRO-DRO-ORO-MRO)	Chloride
H803380																	
1	BH-1		1			X					X		11-19-18		X	X	X
2	BH-2		1			X					X		11-19-18		X	X	X
3	North Wall 1		1			X					X		11-19-18		X	X	X
4	East Wall 1		1			X					X		11-19-18		X	X	X
5	West Wall 1		1			X					X		11-19-18		X	X	X
6	South Wall 1		1			X					X		11-19-18		X	X	X

Relinquished By:	Date: 11-19-18	Received By: Jodi Henson	
	Time: 4:24		
Relinquished By:	Date:	Received By:	
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other: 4.3°C / #97

Sample Condition: Cool: Yes / No; Intact: Yes / No

CHECKED BY: (Initials)

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS: RUSH
Clair.gonzales@tetratech.com
Stephen.reyes@tetratech.com

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL Laboratories

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

November 21, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BATTLE #1 H

Enclosed are the results of analyses for samples received by the laboratory on 11/20/18 15:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: BH-3 (H803399-01)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	**42.1**	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	<10.0	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *88.5 %* *41-142*

Surrogate: 1-Chlorooctadecane *96.1 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: BH-4 (H803399-02)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	<10.0	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	<10.0	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *85.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *85.1 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: EAST WALL 2 (H803399-03)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	<10.0	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	<10.0	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *87.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *86.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: EAST WALL 3 (H803399-04)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *73.3-129*

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	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	<10.0	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	<10.0	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *89.0 %* *41-142*

Surrogate: 1-Chlorooctadecane *88.3 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: SOUTH WALL 2 (H803399-05)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	<10.0	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	<10.0	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *84.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *84.0 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: WEST WALL 2 (H803399-06)

BTEX 8021B mg/kg Analyzed By: ms S-04

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	**0.770**	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	**4.93**	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	**5.70**	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *169 %* *73.3-129*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**144**	16.0	11/21/2018	ND	400	100	400	3.92	

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*	**199**	10.0	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	**6470**	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	**1210**	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *126 %* *41-142*

Surrogate: 1-Chlorooctadecane *165 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/20/2018	Sampling Date:	11/20/2018
Reported:	11/21/2018	Sampling Type:	Soil
Project Name:	BATTLE #1 H	Sampling Condition:	Cool & Intact
Project Number:	2120C- MD-01233	Sample Received By:	Tamara Oldaker
Project Location:	MARATHON OIL - LEA CO NM		

Sample ID: WEST WALL 3 (H803399-07)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/21/2018	ND	2.07	103	2.00	2.33	
Toluene*	<0.050	0.050	11/21/2018	ND	2.01	100	2.00	3.28	
Ethylbenzene*	<0.050	0.050	11/21/2018	ND	1.93	96.7	2.00	3.37	
Total Xylenes*	<0.150	0.150	11/21/2018	ND	6.03	101	6.00	3.13	
Total BTEX	<0.300	0.300	11/21/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *73.3-129*

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	11/21/2018	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	11/21/2018	ND	198	99.0	200	1.21	
DRO >C10-C28*	**133**	10.0	11/21/2018	ND	216	108	200	0.864	
EXT DRO >C28-C36	**68.8**	10.0	11/21/2018	ND					

Surrogate: 1-Chlorooctane *84.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *92.3 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	Tetra Tech
Project Manager:	Clair Gonzales
Address:	901 W. Wall St.
City:	Midland State: TX Zip: 79701
Phone #:	432-260-8634 Fax #:
Project #:	212C-MD-01233 Project Owner: Marathon Oil
Project Name:	Battle #1 H
Project Location:	Lea Co., NM
Sampler Name:	Stephen Reyes

BILL TO

P.O. #:	
Company:	Tetra Tech
Attn:	Clair Gonzales
Address:	901 W. Wall St.
City:	Midland
State:	TX Zip: 79701
Phone #:	432-260-8634
Fax #:	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	BTEX 8021 B	TPH 8015M (GRO-DRO-ORO-MRO)	Chloride
H803399																	
1	BH-3		1			X							11-20-18		X	X	X
2	BH-4		1			X							11-20-18		X	X	X
3	East Wall 2		1			X							11-20-18		X	X	X
4	East Wall 3		1			X							11-20-18		X	X	X
5	South Wall 2		1			X							11-20-18		X	X	X
6	West Wall 2		1			X							11-20-18		X	X	X
7	West Wall 3		1			X							11-20-18		X	X	X

Relinquished By:	Date: 11-20-18	Received By:	
	Time: 15:10		
Relinquished By:	Date:	Received By:	
	Time:		

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: -0.4°C #97

Sample Condition: Cool ☐ Yes ☐ No; Intact ☐ Yes ☐ No

CHECKED BY: (Initials) TC

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS: Rush

Clair.gonzales@tetratech.com
Stephen.reyes@tetratech.com

+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL Laboratories

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

November 27, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BATTLE #1 H

Enclosed are the results of analyses for samples received by the laboratory on 11/26/18 14:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NORTH WALL 1 (3')	H803441-01	Soil	26-Nov-18 00:00	26-Nov-18 14:00
WEST WALL 2 (3')	H803441-02	Soil	26-Nov-18 00:00	26-Nov-18 14:00
NORTH WALL 2 (0-1')	H803441-03	Soil	26-Nov-18 00:00	26-Nov-18 14:00
NORTH WALL 2 (1-1.5')	H803441-04	Soil	26-Nov-18 00:00	26-Nov-18 14:00
NORTH WALL 2 (2-2.5')	H803441-05	Soil	26-Nov-18 00:00	26-Nov-18 14:00

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

NORTH WALL 1 (3')

H803441-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Chloride	**464**		16.0	mg/kg	4	8112708	AC	27-Nov-18	4500-Cl-B	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

WEST WALL 2 (3')

H803441-02 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Petroleum Hydrocarbons by GC FID										**S-04**
GRO C6-C10*	**31.0**		10.0	mg/kg	1	8112701	MS	27-Nov-18	8015B	
DRO >C10-C28*	**3680**		10.0	mg/kg	1	8112701	MS	27-Nov-18	8015B	
EXT DRO >C28-C36	**714**		10.0	mg/kg	1	8112701	MS	27-Nov-18	8015B	
Surrogate: 1-Chlorooctane			*98.1 %*	*41-142*		*8112701*	MS	*27-Nov-18*	*8015B*	
Surrogate: 1-Chlorooctadecane			*233 %*	*37.6-147*		*8112701*	MS	*27-Nov-18*	*8015B*	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

NORTH WALL 2 (0-1')

H803441-03 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Chloride	**64.0**		16.0	mg/kg	4	8112708	AC	27-Nov-18	4500-Cl-B	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

NORTH WALL 2 (1-1.5')

H803441-04 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Chloride	**32.0**		16.0	mg/kg	4	8112708	AC	27-Nov-18	4500-Cl-B	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

NORTH WALL 2 (2-2.5')

H803441-05 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Chloride	**64.0**		16.0	mg/kg	4	8112708	AC	27-Nov-18	4500-Cl-B	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8112708 - General Prep - Wet Chem										
Blank (8112708-BLK1)				Prepared & Analyzed: 27-Nov-18						
Chloride	ND	16.0	mg/kg							
LCS (8112708-BS1)				Prepared & Analyzed: 27-Nov-18						
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (8112708-BSD1)				Prepared & Analyzed: 27-Nov-18						
Chloride	432	16.0	mg/kg	400		108	80-120	0.00	20	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 212C-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 27-Nov-18 14:19

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8112701 - General Prep - Organics										
Blank (8112701-BLK1)				Prepared & Analyzed: 27-Nov-18						
GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	*44.4*		mg/kg	*50.0*		*88.9*	*41-142*			
Surrogate: 1-Chlorooctadecane	*47.1*		mg/kg	*50.0*		*94.1*	*37.6-147*			
LCS (8112701-BS1)				Prepared & Analyzed: 27-Nov-18						
GRO C6-C10	210	10.0	mg/kg	200		105	76.5-133			
DRO >C10-C28	215	10.0	mg/kg	200		107	72.9-138			
Total TPH C6-C28	425	10.0	mg/kg	400		106	78-132			
Surrogate: 1-Chlorooctane	*46.3*		mg/kg	*50.0*		*92.7*	*41-142*			
Surrogate: 1-Chlorooctadecane	*48.5*		mg/kg	*50.0*		*97.0*	*37.6-147*			
LCS Dup (8112701-BSD1)				Prepared & Analyzed: 27-Nov-18						
GRO C6-C10	202	10.0	mg/kg	200		101	76.5-133	4.32	20.6	
DRO >C10-C28	205	10.0	mg/kg	200		102	72.9-138	4.73	20.6	
Total TPH C6-C28	406	10.0	mg/kg	400		102	78-132	4.53	18	
Surrogate: 1-Chlorooctane	*45.5*		mg/kg	*50.0*		*91.1*	*41-142*			
Surrogate: 1-Chlorooctadecane	*47.3*		mg/kg	*50.0*		*94.6*	*37.6-147*			

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	Tetra Tech	**BILL TO**	
Project Manager:	Clair Gonzales	P.O. #:	
Address:	901 W. Wall St.	Company:	Tetra Tech
City:	Midland State: TX Zip: 79701	Attn:	Clair Gonzales
Phone #:	432-260-8634 Fax #:	Address:	901 W. Wall St
Project #:	212C-MD-01233 Project Owner: Marathon Oil	City:	Midland
Project Name:	Battle #1H	State:	TX Zip: 79701
Project Location:	Lea Co., NM	Phone #:	432-260-8634
Sampler Name:	Stephen Reyes	Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: TPH 8015M (GRO-DRO-ORO-MRO)	Chloride
H803441																
1	North Wall 1 (3')		1			X							11-26-18			X
2	West Wall 2 (3')		1			X							11-26-18		X	
3	North Wall 2 (0-1')		1			X							11-26-18			X
4	North Wall 2 (1-1.5')		1			X							11-26-18			X
5	North Wall 2 (2-2.5')		1			X							11-26-18			X

Relinquished By:	Date: 11-26-18 Time: 14:00	Received By:	Tamara Oldaker
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	5.2° #97	Sample Condition Cool: Yes / No Intact: Yes / No	CHECKED BY: (Initials)

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS: Clair.gonzales@tetratech.com
RUSH
Stephen.reyes@tetratech.com

+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

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

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

CONDITIONS

Action 191400

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 191400
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	3/13/2023