

## SITE INFORMATION

**Report Type: Closure Report 1RP-3267**

### General Site Information:

<b>Site:</b>	Battle #1H				
<b>Company:</b>	Marathon Oil Company				
<b>Section, Township and Range</b>	Unit A	Sec. 34	T 21S	R 33E	
<b>Lease Number:</b>	API No. 30-025-41364				
<b>County:</b>	Lea County				
<b>GPS:</b>	32.442117° N			103.552936° W	
<b>Surface Owner:</b>	Richards & Others				
<b>Mineral Owner:</b>	Richards Min. & Royalites etal				
<b>Directions:</b>	From the intersection of Hwy 62/180 and Hwy 176 turn Southeast and go approx. 14.15 miles turn left south and go approx. 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:

<b>Date Released:</b>	8/22/2014	
<b>Type Release:</b>	Produced Water	
<b>Source of Contamination:</b>	Water Based drilling fluid	
<b>Fluid Released:</b>	40 bbls	
<b>Fluids Recovered:</b>	0 bbls	

### Official Communication:

<b>Name:</b>	Callie Karrigan		Clair Gonzales
<b>Company:</b>	Marathon Oil Company		Tetra Tech
<b>Address:</b>	2423 Bonita Street		901 West Wall St
			Suite 100
<b>City:</b>	Carlsbad, New Mexico		Midland, Texas
<b>Phone number:</b>	405-202-1028		(432) 687-8123
<b>Fax:</b>			
<b>Email:</b>	<a href="mailto:cnkarrigan@marathonoil.com">cnkarrigan@marathonoil.com</a>		<a href="mailto:clair.gonzales@tetrattech.com">clair.gonzales@tetrattech.com</a>

### Site Characterization

<b>Depth to Groundwater:</b>	250'-275' below surface
<b>Karst Potential:</b>	Low

### Recommended Remedial Action Levels (RRALs)

Benzene	Total BTEX	TPH (GRO+DRO)	TPH (GRO+DRO+MRO)	Chlorides
10 mg/kg	50 mg/kg	1,000 mg/kg	2,500 mg/kg	20,000 mg/kg



January 8, 2019

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

**Re: Closure Report for the Marathon Oil Company, Battle #1H, Unit A, Section 34, Township 21 South, Range 33 East, Lea County, New Mexico. 1RP-3267**

Ms. Hernandez:

Tetra Tech, Inc. (Tetra Tech) was contacted by Marathon Oil Company (Marathon) to 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 32.441920°, W 103.553730°. The site location is shown on Figures 1 and 2.

## Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on August 22, 2014 and released approximately 40 barrels of produced water due to the shaker being unattended and overflowing onto the roll bin and pad. The impacted area on the pad measures approximately 25' x 20'. 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 USGS National Water Information System does list one well in Section 28 with depth to groundwater of 179' below surface. The New Mexico Office of the State Engineers database list one well in Section 33 with depth to groundwater of 180' 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.

## 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, updated August 14, 2018. 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

Tetra Tech

901 West Wall, Suite 100, Midland, TX 79701

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



(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 on the depth to groundwater, the proposed RRAL for TPH is 2,500 mg/kg (GRO + DRO + ORO) and 1,000 mg/kg (GRO + DRO). Additionally, based on the reported depth to groundwater in the area, the proposed RRAL for chlorides is 20,000 mg/kg.

### **Soil Assessment and Analytical Results**

On November 16 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of one (1) auger hole (AH-1) was installed in the release area on the pad to total a depth of 1.0'-1.5' below surface. Soil samples were collected and submitted to the laboratory for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B, and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, the area of auger hole (AH-1) did not show benzene, total BTEX, or TPH concentrations above the RRALs. Additionally, the area of auger hole (AH-1) showed chloride concentrations below the RRAL with concentrations of 2,500 mg/kg (0-1') and 3,160 mg/kg (1'-1.5').

### **Conclusion**

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

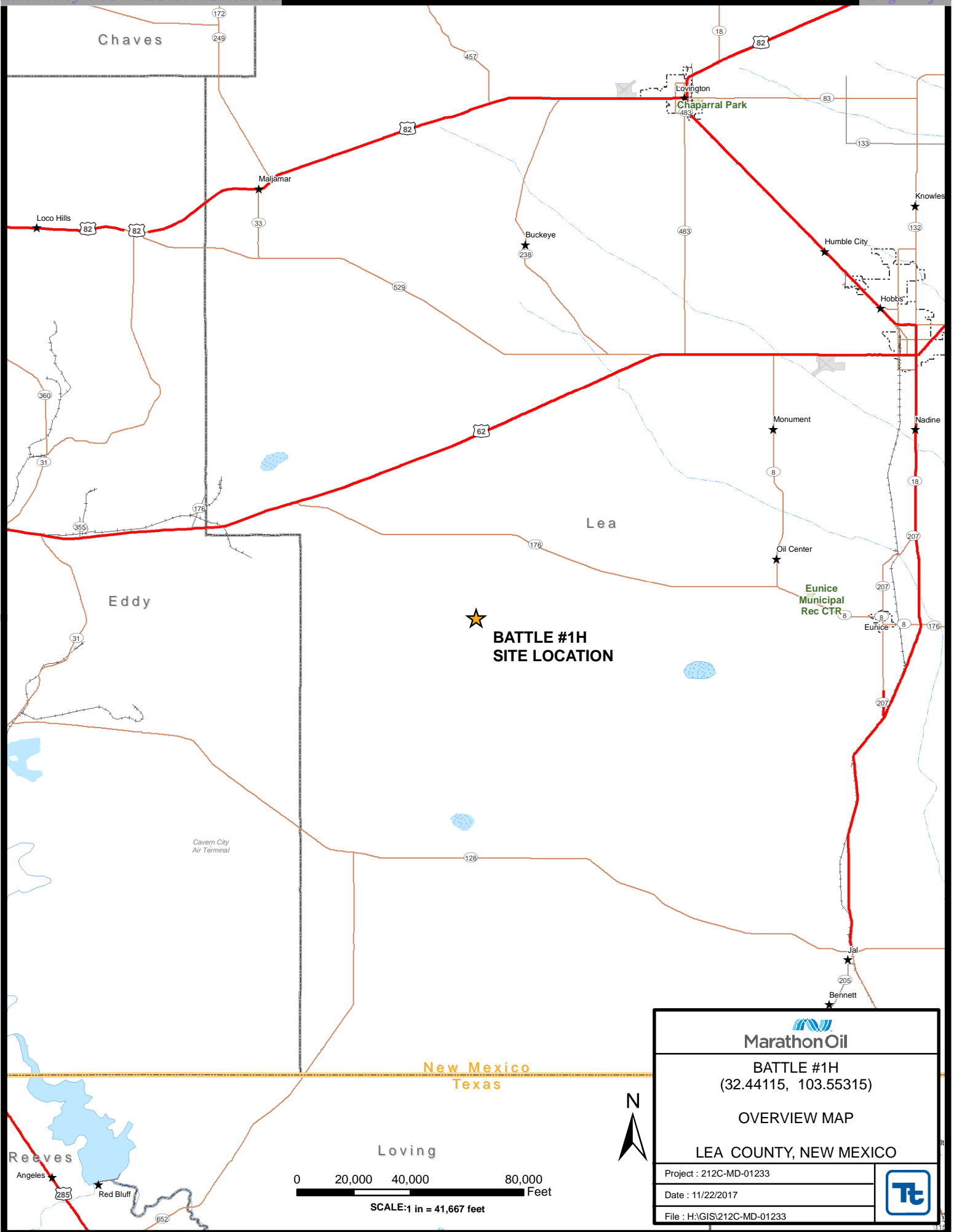
Respectfully submitted,  
TETRA TECH

Clair Gonzales,  
Project Manager



Mike Carmona  
Geologist

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

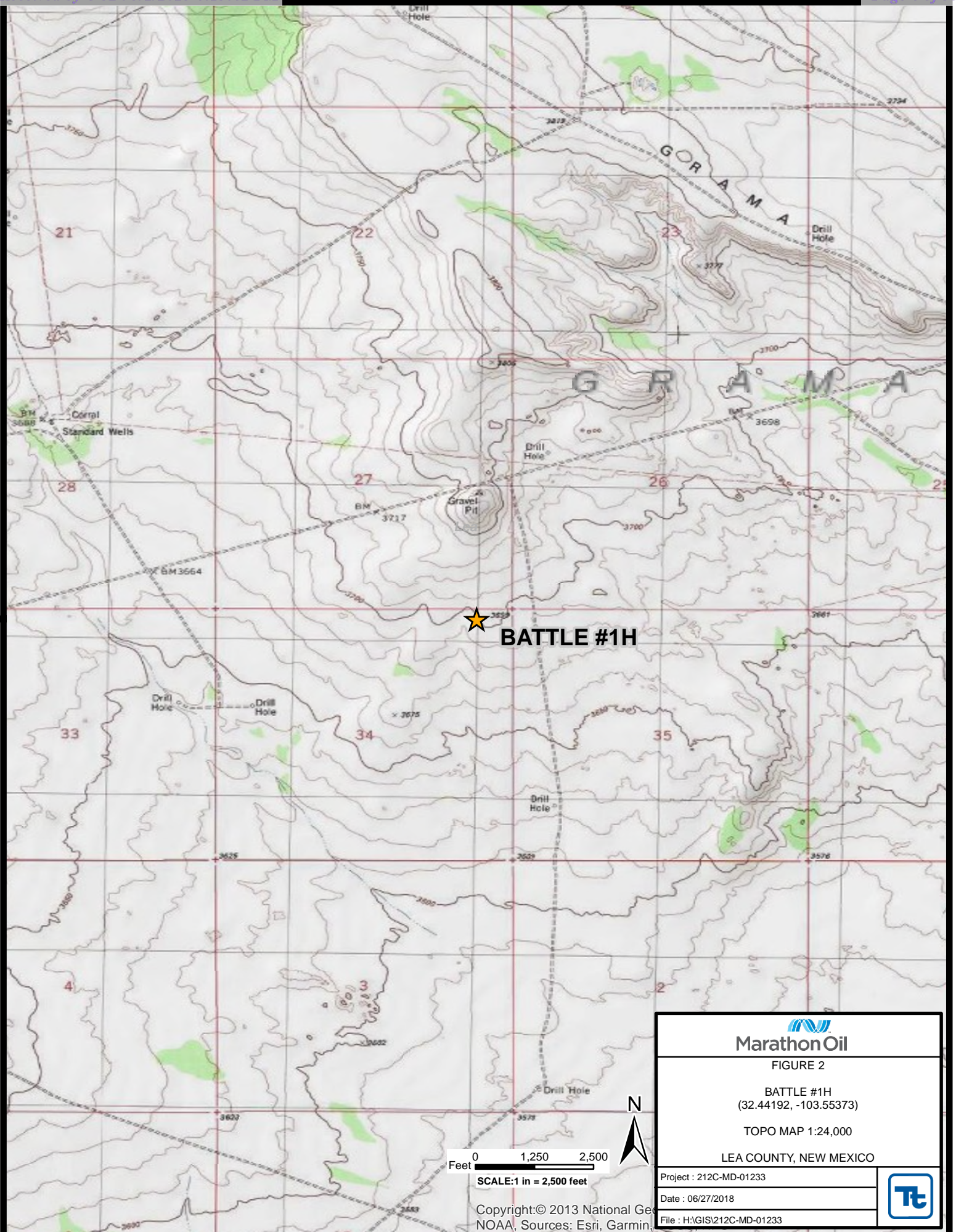
## Figures



★  
**BATTLE #1H  
 SITE LOCATION**

 <b>Marathon Oil</b>	
<b>BATTLE #1H</b> (32.44115, 103.55315)	
<b>OVERVIEW MAP</b>	
<b>LEA COUNTY, NEW MEXICO</b>	
Project : 212C-MD-01233	
Date : 11/22/2017	
File : H:\GIS\212C-MD-01233	
	





**Marathon Oil**

FIGURE 2

BATTLE #1H  
(32.44192, -103.55373)

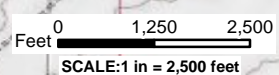
TOPO MAP 1:24,000

LEA COUNTY, NEW MEXICO

Project : 212C-MD-01233

Date : 06/27/2018

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



SCALE: 1 in = 2,500 feet

Copyright: © 2013 National Geographical Society  
NOAA, Sources: Esri, Garmin



AUGER HOLE LOCATION	LATITUDE	LONGITUDE
AH-1	32.442315	-103.552721



# Tables



**Table 1**  
**Marathon Oil Company**  
**Battle #1H (1RP-3267)**  
**Lea County, New Mexico**

Sample ID	Sample Date	Sample Depth (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	11/16/2018	0-1	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	2,560
	"	1-1.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	3,160

(-) Not Analyzed

# Photos

**Marathon Oil Company  
Battle #1H (1RP -3267)  
Lea County, New Mexico**



**TETRA TECH**



View North of area



View Northeast of area



# Appendix A

HOBBS OCD

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 **AUG 25 2014**  
Oil Conservation Division  
1220 South St. Francis Dr. **RECEIVED**  
Santa Fe, NM 87505

Form C-141  
Revised August 8, 2011

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 BC Operating, Inc.	Contact Deane Durham
Address PO Box 50820, Midland, Texas 79710	Telephone No. (432) 253-7748
Facility Name Battle #1H	Facility Type Drilling
Surface Owner Richardson and others	Mineral Owner Richardson Min. & Royalties etal
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	Lca

Latitude 32.4421172 N Longitude 103.5529368 W

**NATURE OF RELEASE**

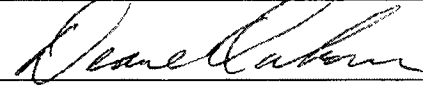
Type of Release steel tank overflow	Volume of Release App. 40 bbl	Volume Recovered
Source of Release Water-Based drilling fluid	Date and Hour of Occ. 0822 2pm	Date and Hour of Discovery 0822 2pm
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Maxey Brown	
By Whom? Speedy Rodriguez, Company Drilling Rep.	Date and Hour 082214 2:10 pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*  
Derrickhand left his post at the shaker unattended. When sweep came around, shaker blinded off with no one to keep them clean, fluid over flowed shaker and went onto roll off bin and ground. Total of 40 bbls lost according to electronic data recorder and some of that went into roll off bin, so less than 40 bbls of drilling fluid spilled on ground.

Describe Area Affected and Cleanup Action Taken.\*  
In and around roll off bin, vacuum truck will pick up any fluid possible and remainder of wet location will be remediated as needed.

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: 	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Deane Durham	Approved by Environmental Specialist:	
Title: Drilling Engineer	Approval Date: 8-25-14	Expiration Date: 10-24-14
E-mail Address: ddurham@bcoperating.com	Conditions of Approval: SITE SUPPLY ROOM	Attached <input type="checkbox"/>
Date: 08222014 Phone: (432) 253-7748	IRP-3267	

\* Attach Additional Sheets If Necessary

*Delimit & conduct area  
as per NMOCD guide  
Submit final C-141 by  
10-24-14*

*ogrid 160825  
NTO 14 23729763  
P7014 23729917  
AUG 25 2014*

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?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input type="checkbox"/> 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?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input type="checkbox"/> 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.



State of New Mexico  
Oil Conservation Division

Page 4

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: 03/29/2023 \_\_\_\_\_

Incident ID	NTO1423729763
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: 03/29/2023

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: 03/29/2023

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 <b>325</b>	4	3	2	1
7	8 <b>278</b>	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
					<b>+300</b>

**Artesia**

**20 South      34 East**

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

**20 South      35 East**

6 <b>56</b>	5 <b>64</b>	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 <b>65</b>	32	33	34	35	36
		<b>89</b>			<b>49</b>
					<b>64</b>

**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 <b>79</b>	1
7	8	9	10	11 <b>100</b>	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33 <b>180</b>	34 <b>572</b>	35	36
			<b>143</b>		
					<b>107</b>
					<b>150</b>
					<b>179</b>
					<b>Site</b>

**21 South      34 East**

6	5	4 <b>95</b>	3	2	1
7	8 <b>120</b>	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28 <b>140</b>	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 <b>382</b>	13
19 (S)	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
					<b>350</b>
					<b>280</b>

**22 South      33 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
					<b>391</b>

**22 South      34 East**

6	5	4	3	2	1
7	8	9	10	11 <b>30</b>	12 <b>50</b>
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 6	Q 4	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column	
<a href="#">CP 00578</a>		CP	LE	4	3	11	21S	33E		636674	3595445*	<input type="checkbox"/>	165	150	15
<a href="#">CP 00579</a>		CP	LE	2	2	02	21S	33E		637438	3598269*	<input type="checkbox"/>	125	100	25
<a href="#">CP 00600 POD1</a>		CP	LE	2	4	25	21S	33E		639152	3591054*	<input type="checkbox"/>	65		
<a href="#">CP 00601 POD1</a>		CP	LE	2	1	28	21S	33E		633502	3591791*	<input type="checkbox"/>	223		
<a href="#">CP 00765 POD1</a>		CP	LE	3	2	13	21S	33E		638698	3594668*	<input type="checkbox"/>	508		
<a href="#">CP 00766 POD1</a>		CP	LE	3	2	13	21S	33E		638698	3594668*	<input type="checkbox"/>	510		
<a href="#">CP 00794 POD1</a>		CP	LE	4	1	18	21S	33E		629976	3594865*	<input type="checkbox"/>	160		
<a href="#">CP 00795 POD1</a>		CP	LE	4	1	18	21S	33E		629976	3594865*	<input type="checkbox"/>	170		
<a href="#">CP 00796 POD1</a>		CP	LE	2	2	4	02	21S	33E	637548	3597564*	<input type="checkbox"/>	102		
<a href="#">CP 00797 POD1</a>		CP	LE	1	2	4	02	21S	33E	637348	3597564*	<input type="checkbox"/>	110		
<a href="#">CP 00801 POD1</a>		CP	LE	3	2	1	11	21S	33E	636555	3596549*	<input type="checkbox"/>	200		
<a href="#">CP 00802 POD1</a>		CP	LE	3	3	2	02	21S	33E	637001	3598672	<input type="checkbox"/>	1154		
<a href="#">CP 00803 POD1</a>		CP	LE	3	2	2	02	21S	33E	637337	3598168*	<input type="checkbox"/>	1100		
<a href="#">CP 00804 POD1</a>		CP	LE	3	2	2	02	21S	33E	637337	3598168*	<input type="checkbox"/>	170		
<a href="#">CP 00854 POD1</a>		CP	LE	1	1	2	33	21S	33E	633879	3590223	<input type="checkbox"/>	950	600	350
<a href="#">CP 01290 POD1</a>		CP	LE	3	1	02	21S	33E		637114	3598855	<input type="checkbox"/>	1250	725	525
<a href="#">CP 01316 POD1</a>		CP	LE	3	2	4	02	21S	33E	637432	3597709	<input type="checkbox"/>	1370		
<a href="#">CP 01317 POD1</a>		CP	LE	1	3	2	02	21S	33E	636884	3598450	<input type="checkbox"/>	1250	1025	225
<a href="#">CP 01349 POD1</a>		CP	LE	2	3	1	27	21S	33E	635304	3591576	<input type="checkbox"/>	1188	572	616
<a href="#">CP 01355 POD1</a>		CP	LE	2	1	3	27	21S	33E	634773	3591061	<input type="checkbox"/>	1192	582	610
<a href="#">CP 01356 POD1</a>		CP	LE	4	2	2	33	21S	33E	634560	3590014	<input type="checkbox"/>	1098	555	543
<a href="#">CP 01357 POD1</a>		CP	LE	4	3	1	27	21S	33E	634782	3591347	<input type="checkbox"/>	1286	578	708
<a href="#">CP 01411 POD1</a>		CP	LE	2	2	34	21S	33E		635968	3590386	<input type="checkbox"/>	1149		
<a href="#">CP 01411 POD2</a>		CP	LE	1	2	34	21S	33E		635534	3590380	<input type="checkbox"/>	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

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

6/19/18 8:33 AM

WATER COLUMN/ AVERAGE DEPTH  
TO WATER



USGS Home  
Contact USGS  
Search USGS

### National Water Information System: Web Interface

USGS Water Resources

Data Category:

Groundwater

Geographic Area:

New Mexico

GO

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.

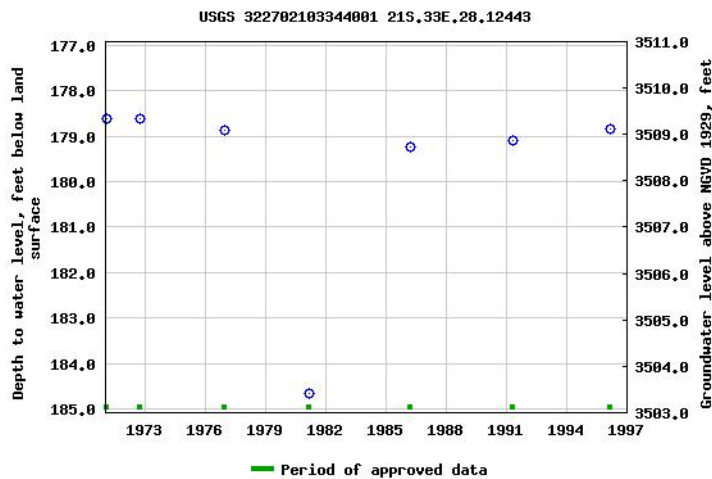
#### Output formats

[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](#)

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[Feedback on this web site](#)

[Automated retrievals](#)

[Help](#)

[Data Tips](#)

[Explanation of terms](#)

[Subscribe for system changes](#)

[News](#)

Accessibility | Plug-Ins | FOIA | Privacy | Policies and Notices

[U.S. Department of the Interior](#) | [U.S. Geological Survey](#)

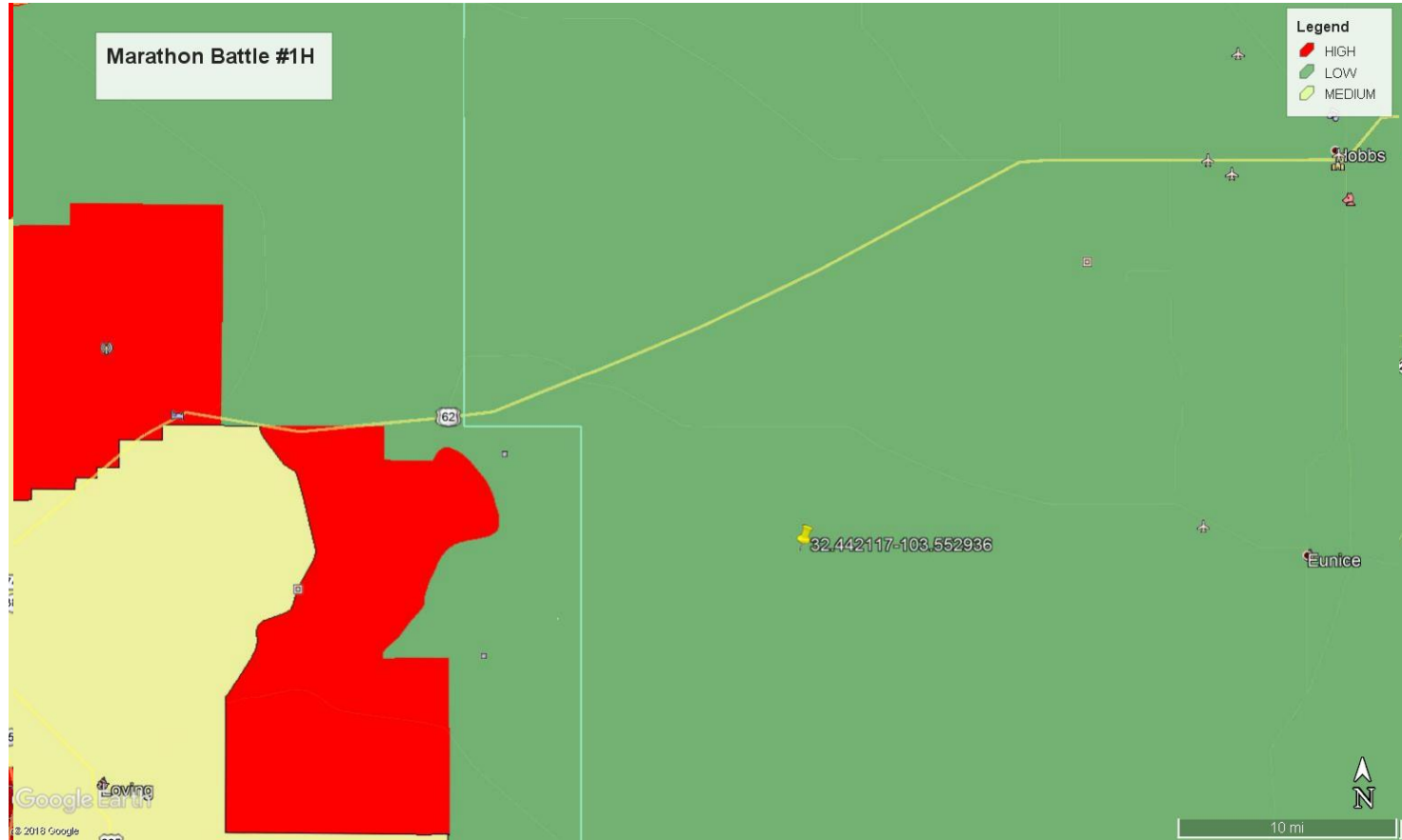
Title: Groundwater for New Mexico: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?>



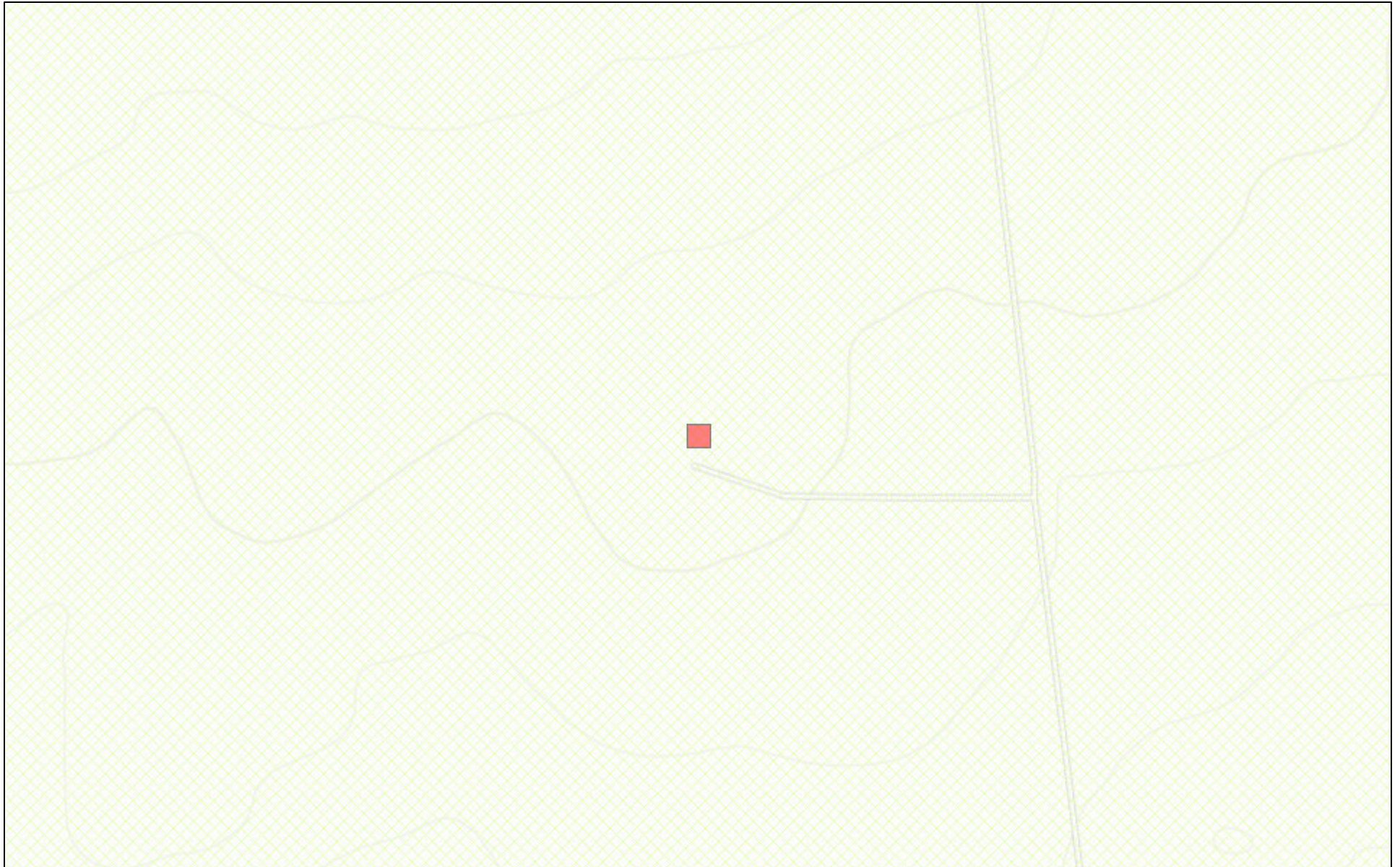
Page Contact Information: [New Mexico Water Data Maintainer](#)

Page Last Modified: 2018-06-19 10:54:53 EDT

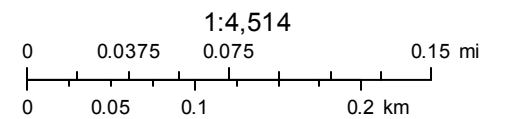




# New Mexico NFHL Data



November 28, 2018



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



# Appendix C



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

November 25, 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 11/16/18 14:50.

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/ga/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/ga/lab_accred_certif.html).

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager



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: 2120-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 25-Nov-18 17:28
---	--	------------------------------

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AH - 1 ( 0-1')	H803346-01	Soil	16-Nov-18 00:00	16-Nov-18 14:50
AH - 1 ( 1-1.5')	H803346-02	Soil	16-Nov-18 00:00	16-Nov-18 14:50

Sample IDs changed from AH-21 to AH-1 as per Clair Gonzales 11/20/18. This is the revised report to replace the one sent on 11/19/18.

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

**Analytical Results For:**

TETRA TECH  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701

Project: BATTLE #1 H  
Project Number: 2120-MD-01233  
Project Manager: CLAIR GONZALES  
Fax To: (432) 682-3946

Reported:  
25-Nov-18 17:28

**AH - 1 ( 0-1' )  
H803346-01 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories****Inorganic Compounds**

<b>Chloride</b>	<b>2560</b>		16.0	mg/kg	4	8111909	AC	19-Nov-18	4500-Cl-B	
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**Volatile Organic Compounds by EPA Method 8021**

Benzene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8111609	ms	17-Nov-18	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			108 %		73.3-129	8111609	ms	17-Nov-18	8021B	
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**Petroleum Hydrocarbons by GC FID**

GRO C6-C10*	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	

Surrogate: 1-Chlorooctane			82.1 %		41-142	8111610	MS	16-Nov-18	8015B	
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Surrogate: 1-Chlorooctadecane			86.0 %		37.6-147	8111610	MS	16-Nov-18	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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: 2120-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 25-Nov-18 17:28
---	--	------------------------------

**AH - 1 ( 1-1.5')**

**H803346-02 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories**

**Inorganic Compounds**

<b>Chloride</b>	<b>3160</b>		16.0	mg/kg	4	8111909	AC	19-Nov-18	4500-Cl-B	
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**Volatile Organic Compounds by EPA Method 8021**

Benzene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	8111609	ms	17-Nov-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8111609	ms	17-Nov-18	8021B	

<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			107 %		73.3-129	8111609	ms	17-Nov-18	8021B	
--	--	--	-------	--	----------	---------	----	-----------	-------	--

**Petroleum Hydrocarbons by GC FID**

GRO C6-C10*	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8111610	MS	16-Nov-18	8015B	

<i>Surrogate: 1-Chlorooctane</i>			84.6 %		41-142	8111610	MS	16-Nov-18	8015B	
----------------------------------	--	--	--------	--	--------	---------	----	-----------	-------	--

<i>Surrogate: 1-Chlorooctadecane</i>			84.9 %		37.6-147	8111610	MS	16-Nov-18	8015B	
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**Analytical Results For:**

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 2120-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 25-Nov-18 17:28
---	--	------------------------------

**Inorganic Compounds - Quality Control**

**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 8111909 - General Prep - Wet Chem</b>										
<b>Blank (8111909-BLK1)</b>										
Prepared & Analyzed: 19-Nov-18										
Chloride	ND	16.0	mg/kg							
<b>LCS (8111909-BS1)</b>										
Prepared & Analyzed: 19-Nov-18										
Chloride	432	16.0	mg/kg	400		108	80-120			
<b>LCS Dup (8111909-BSD1)</b>										
Prepared & Analyzed: 19-Nov-18										
Chloride	400	16.0	mg/kg	400		100	80-120	7.69	20	

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**Analytical Results For:**

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 2120-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 25-Nov-18 17:28
---	--	------------------------------

**Volatile Organic Compounds by EPA Method 8021 - Quality Control**

**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 8111609 - Volatiles**

**Blank (8111609-BLK1)**

Prepared & Analyzed: 16-Nov-18

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.105		mg/kg	0.100		105	73.3-129			

**LCS (8111609-BS1)**

Prepared & Analyzed: 16-Nov-18

Benzene	1.89	0.050	mg/kg	2.00		94.7	72.2-131			
Toluene	1.87	0.050	mg/kg	2.00		93.4	71.7-126			
Ethylbenzene	1.82	0.050	mg/kg	2.00		90.8	68.9-126			
Total Xylenes	5.67	0.150	mg/kg	6.00		94.5	71.4-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.103		mg/kg	0.100		103	73.3-129			

**LCS Dup (8111609-BSD1)**

Prepared & Analyzed: 16-Nov-18

Benzene	1.94	0.050	mg/kg	2.00		97.2	72.2-131	2.59	6.91	
Toluene	1.91	0.050	mg/kg	2.00		95.7	71.7-126	2.42	7.12	
Ethylbenzene	1.86	0.050	mg/kg	2.00		92.8	68.9-126	2.16	7.88	
Total Xylenes	5.83	0.150	mg/kg	6.00		97.1	71.4-125	2.71	7.46	
Surrogate: 4-Bromofluorobenzene (PID)	0.105		mg/kg	0.100		105	73.3-129			

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**Analytical Results For:**

TETRA TECH 901 WEST WALL STREET , STE 100 MIDLAND TX, 79701	Project: BATTLE #1 H Project Number: 2120-MD-01233 Project Manager: CLAIR GONZALES Fax To: (432) 682-3946	Reported: 25-Nov-18 17:28
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**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
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**Batch 8111610 - General Prep - Organics**

<b>Blank (8111610-BLK1)</b>			Prepared & Analyzed: 16-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	49.6		mg/kg	50.0		99.3	41-142			
Surrogate: 1-Chlorooctadecane	49.2		mg/kg	50.0		98.4	37.6-147			

<b>LCS (8111610-BS1)</b>			Prepared & Analyzed: 16-Nov-18							
GRO C6-C10	174	10.0	mg/kg	200		87.1	76.5-133			
DRO >C10-C28	188	10.0	mg/kg	200		94.1	72.9-138			
Total TPH C6-C28	362	10.0	mg/kg	400		90.6	78-132			
Surrogate: 1-Chlorooctane	48.4		mg/kg	50.0		96.9	41-142			
Surrogate: 1-Chlorooctadecane	49.4		mg/kg	50.0		98.8	37.6-147			

<b>LCS Dup (8111610-BSD1)</b>			Prepared & Analyzed: 16-Nov-18							
GRO C6-C10	190	10.0	mg/kg	200		95.2	76.5-133	8.88	20.6	
DRO >C10-C28	204	10.0	mg/kg	200		102	72.9-138	8.25	20.6	
Total TPH C6-C28	395	10.0	mg/kg	400		98.7	78-132	8.56	18	
Surrogate: 1-Chlorooctane	47.2		mg/kg	50.0		94.3	41-142			
Surrogate: 1-Chlorooctadecane	47.5		mg/kg	50.0		95.0	37.6-147			

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: **Texra Tech**  
 Project Manager: **Clair Gonzales**  
 Address: **401 West Wall St.**  
 City: **Mildred** State: **TX** zip: **79901**  
 Phone #: **432-260-8634** Fax #:  
 Project #: **2126-NM-01233** Project Owner: **Marathon Oil**  
 Project Name: **Baxxle #1 A**  
 Project Location: **Lea Co., NM**  
 Sampler Name: **Stephen Reyes**  
 P.O. #: Company: **Texra Tech**  
 Attn: **Clair Gonzales**  
 Address: **401 W. Wall St.**  
 City: **Mildred** State: **TX** zip: **79901**  
 Phone #: **432-260-8634** Fax #:

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	REMARKS
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :			
<b>H803346</b>	<b>AH-1</b>		1			X				11-16-18		BTEX 8021 B
	<b>AH-1 (0-1')</b>		1			X				11-16-18		TPH 8015 M (Gro-Dro-Dro-Mro)
	<b>AH-1 (1-1.5')</b>		1			X				11-16-18		Chloride

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Relinquished By: \_\_\_\_\_ Date: **11-16-18**  
 Time: **14:50**  
 Received By: **Stephen Reyes**  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_

Delivered By: (Circle One) **Sample** - UPS - Bus - Other: \_\_\_\_\_  
 Sample Condition: Cool  Yes  No Intact  Yes  No  
 CHECKED BY: (Initials) **TR**

REMARKS: **\* Sample ID changed as per Clair. 11/20/18**  
 Phone Result:  Yes  No Add'l Phone #: \_\_\_\_\_  
 Fax Result:  Yes  No Add'l Fax #: \_\_\_\_\_  
**RUSH**  
 Clair.gonzales@texratech.com  
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**District III**  
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**District IV**  
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**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS

Action 192714

**CONDITIONS**

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 192714
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

**CONDITIONS**

Created By	Condition	Condition Date
jharimon	None	3/29/2023