



May 30, 2019

Vertex Project #: 19E-00614-006

Spill Closure Report: Aid State #008 (Section 13, Township 17 South, Range 28 East)
API: 30-015-38142
County: Eddy
Incident Report: 2RP-5350

Prepared For: **Marathon Oil Permian LLC**
4111 South Tidwell Road
Carlsbad, New Mexico 88220

New Mexico Oil Conservation Division – District 2 - Artesia

811 S. 1st Street
Artesia, New Mexico 88210

Marathon Oil Permian LLC retained Vertex Resource Services Inc. (Vertex) to conduct a Spill Assessment for a release of crude oil caused by the rubber on top of a tubing gauge to fail at Aid State #008, API 30-015-38142, Incident 2RP-5350 (hereafter referred to as “site”). This letter provides a description of the Spill Assessment and includes a request for Spill Closure. The spill area is located at N 32.8405151 W -104.1224747.

Background

The site is located approximately 35 miles north of Carlsbad, New Mexico. The legal location for the site is Section 13, Township 17 South and Range 28 East in Eddy County, New Mexico. The spill area is located on State Land. An aerial photograph and site schematic are included in Attachment 1.

The *Geological Map of New Mexico* (New Mexico Bureau of Geology and Mineral Resources, 2014 – 2017) indicates the site’s surface geology is comprised primarily of Qoa ---- Older alluvial deposits of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region (middle to lower Pleistocene)—Includes scattered lacustrine, playa, and alluvial deposits of the Tahoka, Double Tanks, Tule, Blackwater Draw, and Gatuña Formations, the latter of which may be Pliocene at base; outcrops, however, are basically of Quaternary deposits. Predominant soil texture on the site is gravelly fine sandy loam.

Incident Description

A spill occurred on March 31, 2019, due to the rubber top of a tubing gauge failing. The spill was reported March 31, 2019 and involved the release of approximately 9.97 barrels (bbls) of produced oil onto the pad. No free-flowing fluid was removed during the initial spill clean-up. The New Mexico Oil Conservation Division (NMOCD) C-141 Report: 2RP-5350 is included in Attachment 2. The Daily Field Report (DFR) and site photographs are included in Attachment 3.

Closure Criteria Determination

The depth to groundwater was determined using information from Oil and Gas Drilling records and the New Mexico Office of the State Engineer Water Column/Average Depth to Water report. A 5,000-meter search radius was used to determine groundwater depth. The closest recorded depth to groundwater was determined to be 58 feet below ground surface (bgs) and is 2,450 feet from the location of the spill. Documentation used in Closure Criteria Determination research is included in Attachment 4.

Table 1. Closure Criteria Determination			
Site Name: Aid State 008			
Spill Coordinates: 32.84050 -104.12250			
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	58	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	2450	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	15005	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	4968	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or	5231	feet
	ii) Within 1000 feet of any fresh water well or spring	5231	feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	5925	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
10	Within a 100-year Floodplain	>500	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria		51-100'	<50' 51-100' >100'

The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 2.

Table 2. Closure Criteria for Soils Impacted by a Release		
Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	Constituent	Limit
51 feet - 100 feet	Chloride	10,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

Remedial Actions Taken

An initial site inspection of the spill area was completed on March 31, 2019, which identified the area of the spill specified in the initial C-141 Report, estimated the approximate volume of the spill and white lined the area required for the 811 One Call request. The impacted area was determined to be approximately 39 feet long and 25 feet wide; the total affected area was determined to be 497 square feet. The DFR associated with the site is included in Attachment 3.

Remediation efforts began on April 5, 2019 and was completed on April 10, 2019. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on a total of four (4) sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), a Dextsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and Quantabs (chlorides). Field screening results were used to identify areas requiring further remediation from those areas showing concentrations below determined closure criteria levels. Soils were removed as close to the existing production infrastructure as possible in compliance with Marathon Oil Permian, LLC safety guidelines. Soils were removed to a depth of 6 inches bgs. Impacted soil was transported by a licensed waste hauler and disposal at an approved waste management facility. Waste Manifest is presented in Attachment 5. Field screening results are presented in Table 3, Attachment 6, as well as in the DFR presented in Attachment 3.

Notification that confirmatory samples were being collected was provided to the NMOCD on April 5, 2019 and are included in Attachment 7. Confirmatory composite samples were collected from the base of the excavation in 200 square foot increments. A total of three (3) samples (SS19-01 to SS19-03), including one (1) background sample, were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to XENCO Laboratories under chain-of-custody protocols and analyzed for BTEX (EPA Method 8021B), Total Petroleum Hydrocarbons (GRO, DRO, MRO – EPA Method SW8015Mod) and Total Chlorides (EPA Method 300.0). Laboratory results are presented in Table 3, Attachment 6. Confirmatory samples collected and analyzed were below closure criteria for the site except in proximity to the wellhead. The locations with above closure criteria concentrations that are in proximity to the well had are identified as SS19-01 and SS19-02.

Closure Request

The spill area was fully delineated, remediated and backfilled with local soils by April 24, 2019. Confirmatory samples were analyzed by the laboratory and were below the allowable concentrations as per the New Mexico Administrative Code (NMAC) Closure Criteria for Soils Impacted by a Release, locations “51-100 feet” except in the area adjacent to the well head. Due to the proximity to the wellhead, Marathon Oil Permian LLC would like to request to defer final

remediation around the wellhead until the equipment is removed or when the well or facility is plugged or abandoned, whichever comes first. Based on these findings, Marathon Oil Permian LLC requests that this spill be closed.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 575.361.1137 or dwilliams@vertex.ca.

Sincerely,



Dennis Williams
ENVIRONMENTAL EARTHWORKS ADVISOR

Attachments

- Attachment 1. Site Schematic
- Attachment 2. NMOCD C-141 Report
- Attachment 3. Daily Field Report(s) with Pictures
- Attachment 4. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
- Attachment 5. Waste Manifest(s)
- Attachment 6. Table 3 - Laboratory Results Table
- Attachment 7. Confirmatory Sample Notification to the NMOCD
- Attachment 8. Laboratory Data Reports and COCs

References

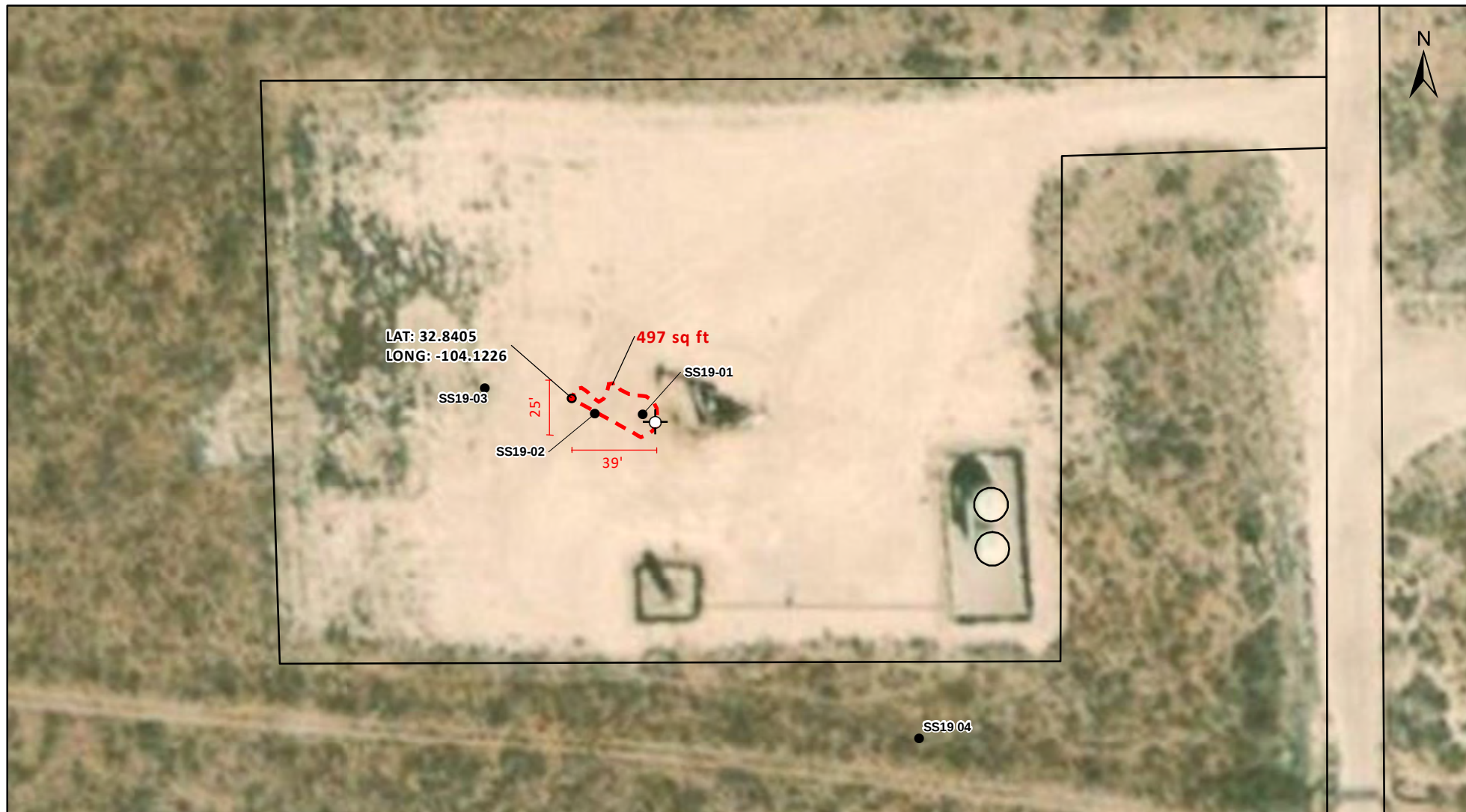
1. *Water Column/Average Depth to Water Report*. New Mexico Water Rights Reporting System, (2019). Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html>
2. *Assessed and Impaired Waters of New Mexico*. New Mexico Department of Surface Water Quality Bureau, (2019). Retrieved from <https://gis.web.env.nm.gov/oem/?map=swqb>
3. *Interactive Geologic Map*. New Mexico Bureau of Geology and Mineral Resources, (2019). Retrieved from <http://geoinfo.nmt.edu>
4. *Measured Distance from the Subject Site to Residence*. Google Earth Pro, (2019). Retrieved from <https://earth.google.com>
5. *Point of Diversion Location Report*. New Mexico Water Rights Reporting System, (2019). Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/wellSurfaceDiversion.html>
6. *Measured Distance from the Subject Site to Municipal Boundaries*. Google Earth Pro, (2019). Retrieved from <https://earth.google.com>
7. *National Wetland Inventory Surface Waters and Wetland*. United State Fish and Wildlife Service, (2019). Retrieved from <https://www.fws.gov/wetlands/data/mapper.html>
8. *Coal Mine Resources in New Mexico*. NM Mining and Minerals Division, (2019). Retrieved from <http://www.emnrd.state.nm.us/MMD/gismapminedata.html>
9. *New Mexico Cave/Karsts*. United States Department of the Interior, Bureau of Land Management, (2019) Retrieved from <https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico>
10. *Flood Map Number 35015C1875D*. United States Department of Homeland Security, FEMA Flood Map Service Center, (2010). Retrieved from <https://msc.fema.gov/portal/search?AddressQuery=malaga%20new%20mexico#searchresultsanchor>
11. *Well Log/Meter Information Report*. NM Office of the State Engineer, New Mexico Water Rights Reporting System. (2019). Retrieved from <http://nmwrrs.ose.state.nm.us/nmwrrs/meterReport.html>
12. *Natural Resources and Wildlife Oil and Gas Releases*. New Mexico Oil Conservation Division, (2019). Santa Fe, New Mexico.
13. *Soil Survey, New Mexico*. United States Department of Agriculture, Soil Conservation Service in Cooperation with New Mexico Agricultural Experiment Station. (1971). Retrieved from http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/Chugg%20et%20al%201971%20w-map.pdf

Limitations

This report has been prepared for the sole benefit of Marathon Oil Permian LLC. This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division, without the express written consent of Vertex Resource Services Inc. (Vertex) and Marathon Oil Permian LLC. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

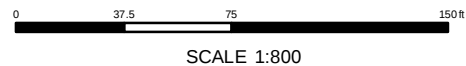
ATTACHMENT 1



LEGEND

-  WELL
-  SOIL SAMPLE
-  ROAD
-  SPILL AREA
-  TANK

Notes: Aerial Image from ESRI Digital Globe 2017



Site Schematic
Aid State #008



DRAWN:	NM
APPROVED:	RF
DATE:	APRIL 24/19

FIGURE:

1

VERSATILITY. EXPERTISE.

ATTACHMENT 2

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	NAB1910934590
District RP	2RP-5350
Facility ID	
Application ID	pAB1910934259

Release Notification

Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # (assigned by OCD) NAB1910934590
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

Incident ID	NAB1910934590
District RP	2RP-5350
Facility ID	
Application ID	pAB1910934259

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 <u>not</u> 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: <u>Isaac Castro</u>	Date: _____
email: _____	Telephone: _____
<u>OCD Only</u> Received by: <u>Ana Maria B. Ramirez</u> Date: <u>4/19/2019</u>	

ATTACHMENT 3

Daily Site Visit Report



Client:	<u>Marathon Oil Permian LLC</u>	Inspection Date:	<u>3/31/2019</u>
Site Location Name:	<u>Aid State 008 Marathon Oil Permian LLC</u>	Report Run Date:	<u>4/1/2019 2:39 PM</u>
Project Owner:	<u>Isaac Castro</u>	File (Project) #:	<u>19E-00614</u>
Project Manager:	<u>Dennis Williams</u>	API #:	<u>30-015-38142</u>
Client Contact Name:	<u>Callie Karrigan</u>	Reference	<u>Tubing Line Gauge failure</u>
Client Contact Phone #:	<u>(405) 202-1028</u>		

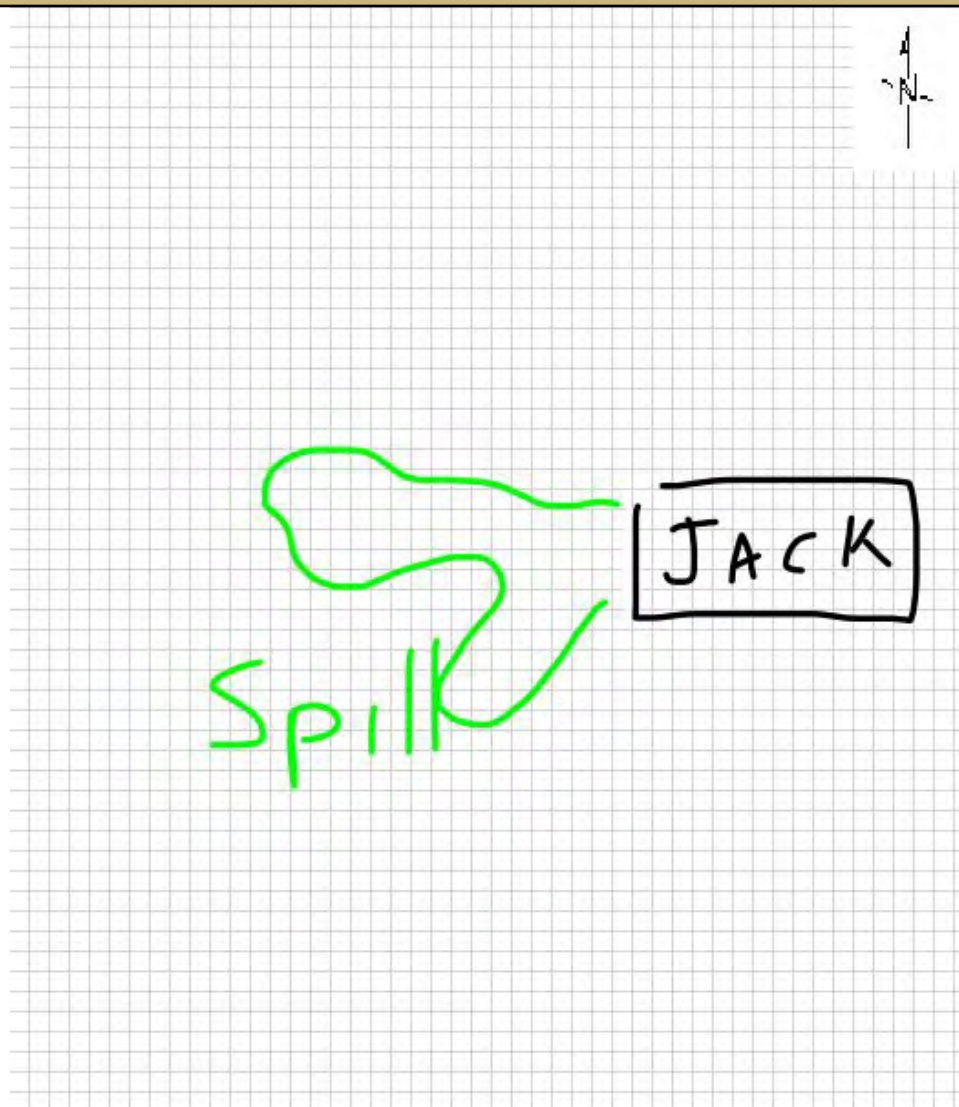
Summary of Times

Left Office	<u>3/31/2019 6:15 PM</u>
Arrived at Site	<u>3/31/2019 7:06 PM</u>
Departed Site	<u>3/31/2019 7:27 PM</u>
Returned to Office	<u>3/31/2019 8:33 PM</u>

Daily Site Visit Report



Site Sketch



Daily Site Visit Report



Summary of Daily Operations

19:07 Locate spill
Take pictures and document on DFR
GPS spill

Next Steps & Recommendations

- 1 Send GPS mapping to create map of spill
- 2 Send report to client

Daily Site Visit Report



Site Photos

Viewing Direction: Northwest



Description Photo
Viewing Direction: Northwest
Desc: Spill near pump jack
Created: 3/31/2019 2:12:01 PM
Lat:32.840390, Long: -104.122210

Spill near pump jack

Viewing Direction: Northwest



Description Photo
Viewing Direction: Northwest
Desc: Spill near pump jack
Created: 3/31/2019 2:12:01 PM
Lat:32.840390, Long: -104.122210

Spill near pump jack

Viewing Direction: Northeast



Description Photo
Viewing Direction: Northeast
Desc: Spill near pump jack
Created: 3/31/2019 2:12:01 PM
Lat:32.840390, Long: -104.122210

Spill near pump jack

Viewing Direction: East



Description Photo
Viewing Direction: East
Desc: Spill near pump jack
Created: 3/31/2019 2:12:01 PM
Lat:32.840390, Long: -104.122210

Spill near pump jack

Daily Site Visit Report



Viewing Direction: South



Spill near pump jack

Viewing Direction: Southeast



Spill near pump jack

Viewing Direction: Southwest



Spill near pump jack

Viewing Direction: Southwest



Spill near pump jack

Daily Site Visit Report



Viewing Direction: West



Spill near pump jack

Daily Site Visit Report



Daily Site Visit Signature

Signature of Inspector:

A handwritten signature in black ink, appearing to be 'A. H.', written over a horizontal line.

Signature

Daily Site Visit Report



Client: Marathon Oil Permian LLC
Site Location Name: Aid State #008
Project Owner: Isaac Castro
Project Manager: Dennis Williams
Client Contact Name: Callie Karrigan
Client Contact Phone #: (405) 202-1028

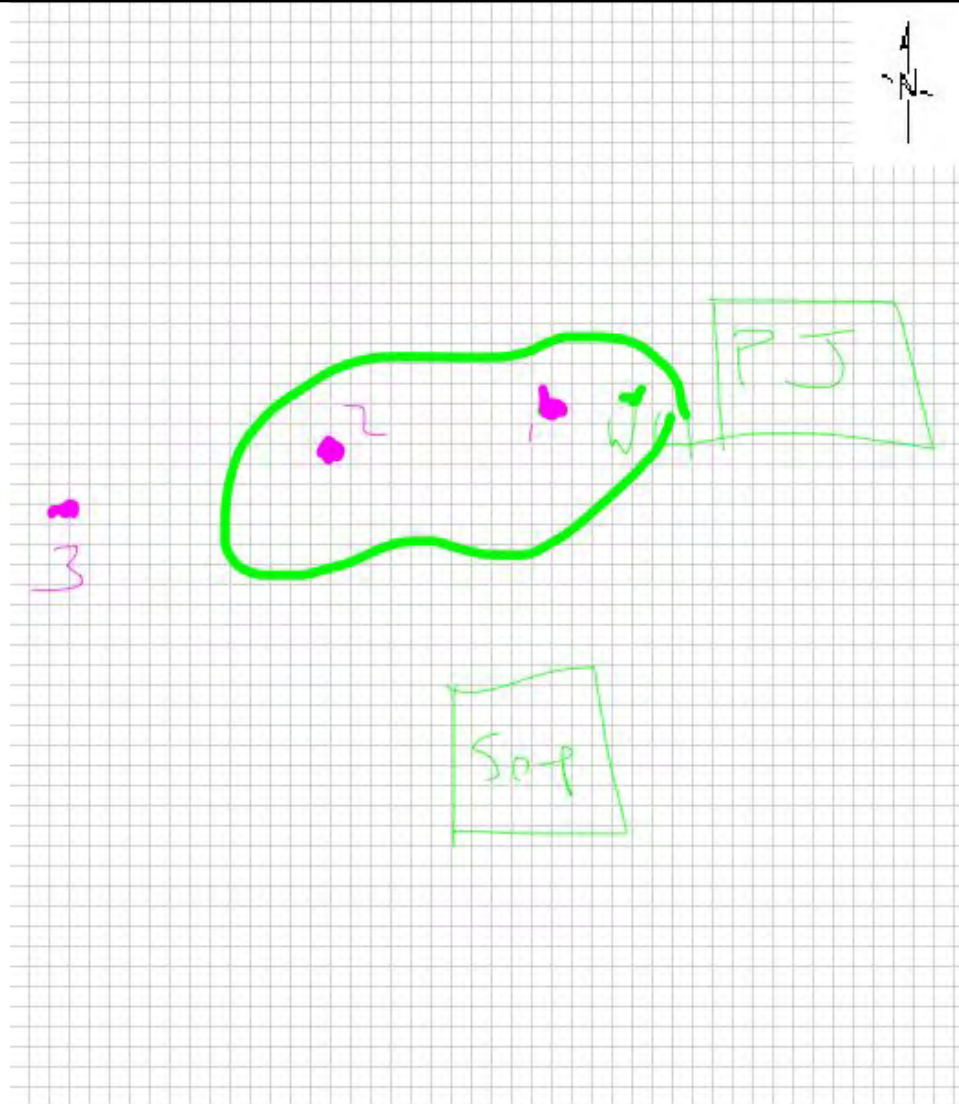
Inspection Date: 4/5/2019
Report Run Date: 4/5/2019 7:12 PM
File (Project) #: 19E-00614
API #: 30-015-38142
Reference: Tubing Line Gauge Failure

Summary of Times

Left Office 4/5/2019 7:17 AM
Arrived at Site 4/5/2019 8:24 AM
Departed Site 4/5/2019 11:51 AM
Returned to Office 4/5/2019 12:49 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report



Summary of Daily Operations

8:46 Complete all safety paperwork, safety meeting and arrival form.

8:46 Excavate and sample as we go along.

Next Steps & Recommendations

1 Collect confirmatory samples.

2 Wait for lab results and review results.

Sampling

SS19-01									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.	5 ppm	75 ppm	High (300-6000ppm)	2262 ppm			32.50'25.635", - 104.07'20.912"	Yes	
SS19-02									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.	4 ppm	107 ppm	High (300-6000ppm)	570 ppm			32.50'25.639", - 104.07'21.173"	Yes	
SS19-03									
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?	
0 ft.	0 ppm	0 ppm	High (300-6000ppm)	0 ppm			32.50'25.763", - 104.07'21.769"	Yes	

Daily Site Visit Report



Site Photos

Viewing Direction: North



Descriptive Photo
Viewing Direction: North
Desc: Excavation area
Created: 4/5/2019 10:48:45 AM
Lat:32.846371, Long:-104.122493

Excavation area

Viewing Direction: South



Descriptive Photo
Viewing Direction: South
Desc: Excavation area
Created: 4/5/2019 10:50:37 AM
Lat:32.846346, Long:-104.122496

Excavation area

Viewing Direction: East



Descriptive Photo
Viewing Direction: East
Desc: Excavation area
Created: 4/5/2019 10:51:31 AM
Lat:32.846353, Long:-104.122501

Excavation area

Viewing Direction: East



Descriptive Photo
Viewing Direction: East
Desc: Ss19-02
Created: 4/5/2019 10:52:37 AM
Lat:32.846346, Long:-104.122545

Ss19-02

Daily Site Visit Report

Viewing Direction: East



Ss19-01

Viewing Direction: Northwest



Excavation area

Viewing Direction: East



Ss19-03

Viewing Direction: East



Excavation area fenced off

Daily Site Visit Report

Viewing Direction: North



Descriptive Photo
Viewing Direction: North
Object: Soil pile 18ft x 9ft x 1ft
Created: 4/5/2019 11:13:13 AM
Lat: 33.840236, Long: -104.122493

Soil pile 18ft x 9ft x 1ft

Viewing Direction: West



Descriptive Photo
Viewing Direction: West
Object: Soil pile 18ft x 9ft x 1ft
Created: 4/5/2019 11:13:13 AM
Lat: 33.840236, Long: -104.122493

Soil pile 18ft x 9ft x 1ft

Daily Site Visit Report



Depth Sample Photos

Sample Point ID: SS19-01



Depth: 0ft.

Sample Point ID: SS19-02



Depth: 0ft.

Sample Point ID: SS19-03



Depth: 0ft.

Daily Site Visit Report



Daily Site Visit Signature

Signature of Inspector:

Signature

A handwritten signature in black ink, consisting of a large, stylized 'R' followed by several horizontal strokes, written over a thin horizontal line.

Daily Site Visit Report

Client: Marathon Oil Permian LLC
Site Location Name: Aid State #008
Project Owner: Isaac Castro
Project Manager: Dennis Williams
Client Contact Name: Callie Karrigan
Client Contact Phone #: (405) 202-1028

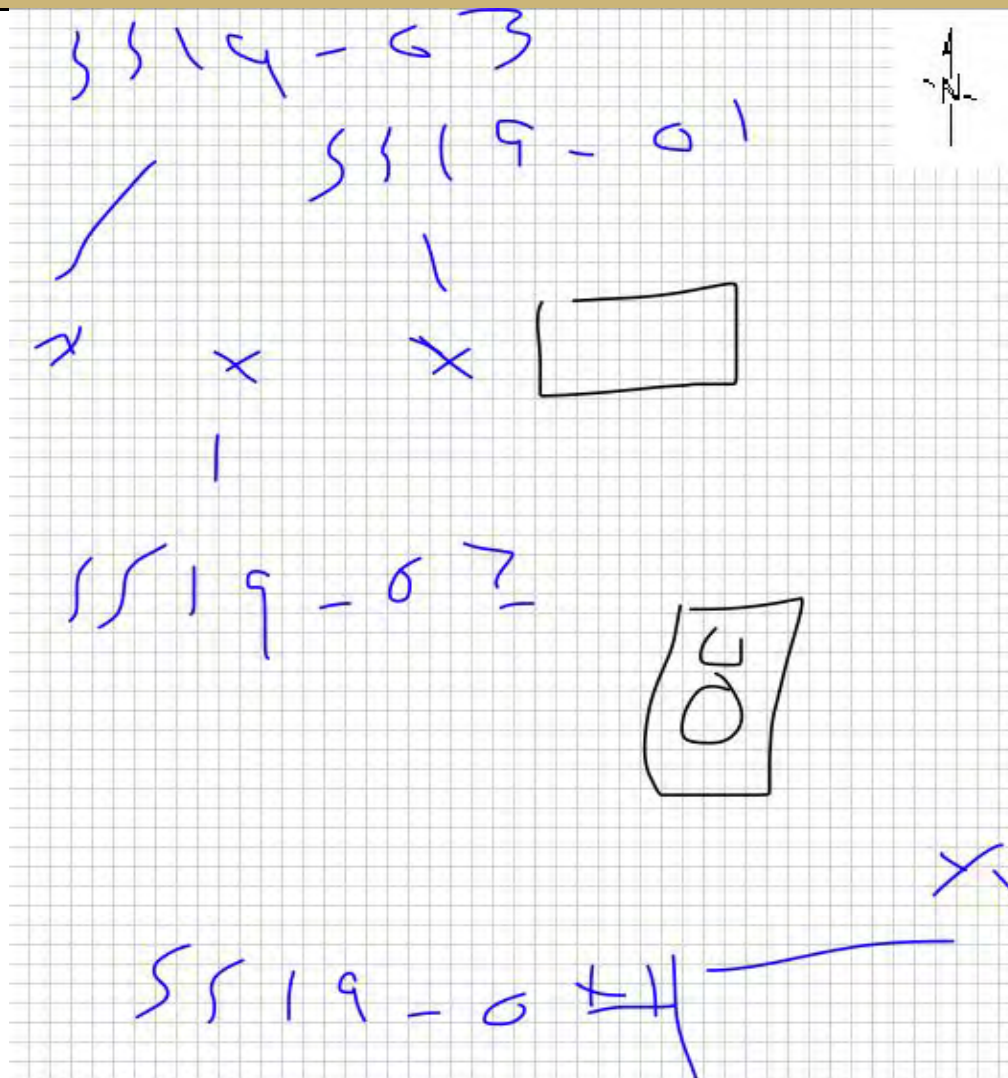
Inspection Date: 4/10/2019
Report Run Date: 4/10/2019 9:12 PM
File (Project) #: 19E-00614
API #: 30-015-38142
Reference: Tubing Line Gauge Failure

Summary of Times

Left Office 4/10/2019 11:00 AM
Arrived at Site 4/10/2019 12:13 PM
Departed Site 4/10/2019 1:44 PM
Returned to Office 4/10/2019 2:59 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report



Summary of Daily Operations

12:50 Fill out arrival and safety forms

Next Steps & Recommendations

- 1 Ship samples
- 2 Return 4-11-2019 when winds die down to remove contaminated soil

Sampling

SS19-01

Depth	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
6 IN					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)		32°50'25.635"N, 104°07'20.912"W	Yes

SS19-02

Depth	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
6 IN					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)		32°50'25.639"N, 104°07'21.173"W	Yes

SS19-03

Depth	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
6 IN					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)		32°50'25.763"N, 104°07'21.769"W	Yes

SS19-04

Depth	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
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Daily Site Visit Report



6 IN					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)		32°50'24.138"N, 104°07'19.421"W	Yes
------	--	--	--	--	---	--	------------------------------------	-----

Daily Site Visit Report



Site Photos

Viewing Direction: South



Fenced off excavation

Viewing Direction: East



SS19-01

Viewing Direction: East



SS19-02

Viewing Direction: East



SS19-03

Daily Site Visit Report

Viewing Direction: South



Contaminated soil pile

Viewing Direction: East



SS19-04

Daily Site Visit Report



Depth Sample Photos

Sample Point ID: SS19-01



Depth: 6 in.

Sample Point ID: SS19-02



Depth: 6 in.

Sample Point ID: SS19-03



Depth: 6 in.

Sample Point ID: SS19-04



Depth: 6 in.

Daily Site Visit Report



Daily Site Visit Signature

Inspector: Jason Crabtree

Signature:


Signature

Daily Site Visit Report

Client:	Marathon Oil Permian LLC	Inspection Date:	4/11/2019
Site Location Name:	Aid State #008	Report Run Date:	4/11/2019 7:52 PM
Project Owner:	Isaac Castro	File (Project) #:	19E-00614
Project Manager:	Dennis Williams	API #:	30-015-38142
Client Contact Name:	Callie Karrigan	Reference	Tubing Line Gauge Failure
Client Contact Phone #:	(405) 202-1028		

Summary of Times

Left Office	4/11/2019 7:45 AM
Arrived at Site	4/11/2019 8:58 AM
Departed Site	4/11/2019 11:32 AM
Returned to Office	4/11/2019 1:19 PM

Summary of Daily Operations

9:02 Conduct safety meeting.
Load out contaminated material

Next Steps & Recommendations

- 1 Await Lab results.
- 2 Backfill, remove fence.
- 3 Write closure report

Daily Site Visit Report



Site Photos

Viewing Direction: Southwest



Containment soil pile.

Viewing Direction: West



Contaminated material being loaded out.

Viewing Direction: North



Caliche pile for backfill.

Viewing Direction: West



Cleaned up soil pile area.

Daily Site Visit Report



Daily Site Visit Signature

Inspector: Dennis Williams

Signature: 
Signature

Daily Site Visit Report



Client:	<u>Marathon Oil Permian LLC</u>	Inspection Date:	<u>4/24/2019</u>
Site Location Name:	<u>Aid State #008</u>	Report Run Date:	<u>4/24/2019 5:59 PM</u>
Project Owner:	<u>Isaac Castro</u>	File (Project) #:	<u>19E-00614</u>
Project Manager:	<u>Dennis Williams</u>	API #:	<u>30-015-38142</u>
Client Contact Name:	<u>Callie Karrigan</u>	Reference	<u>Tubing Line Gauge Failure</u>
Client Contact Phone #:	<u>(405) 202-1028</u>		

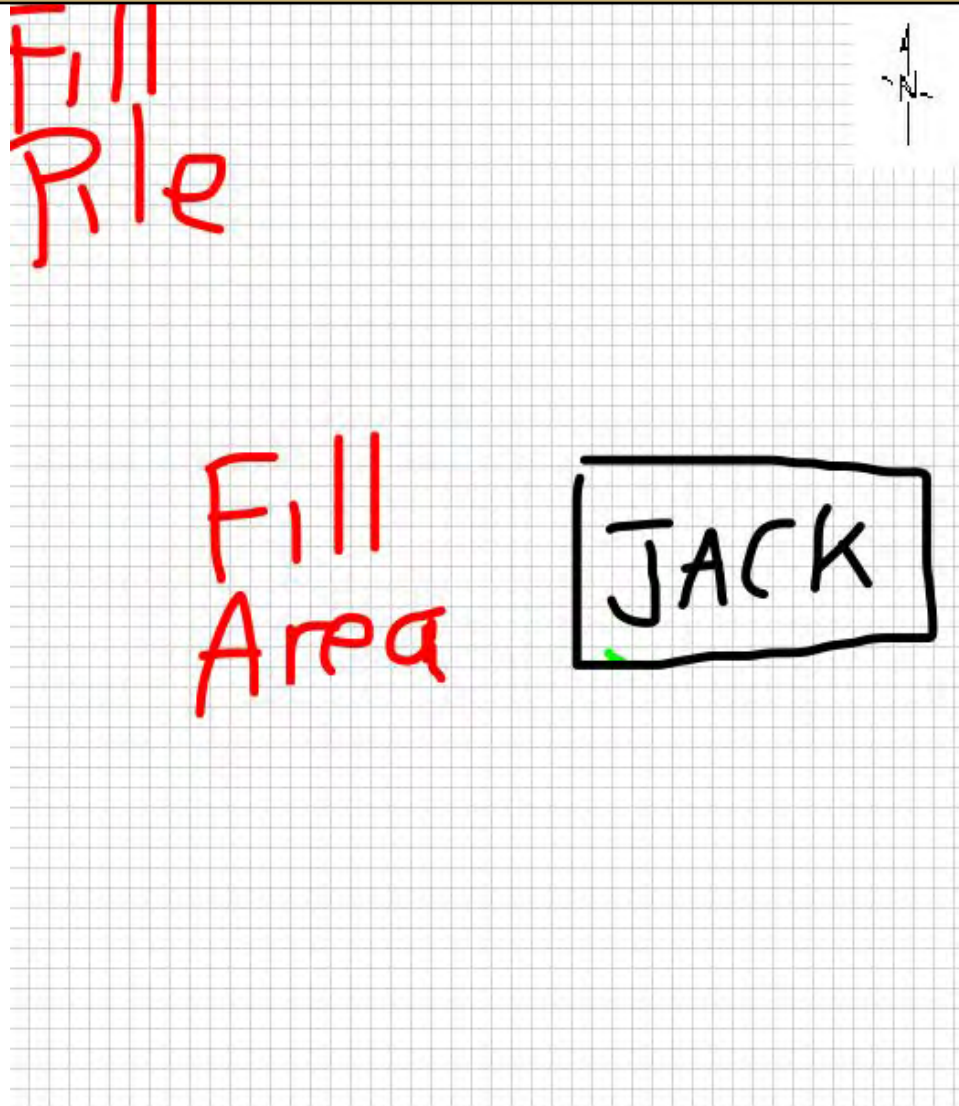
Summary of Times

Left Office	<u>4/24/2019 7:00 AM</u>
Arrived at Site	<u>4/24/2019 8:00 AM</u>
Departed Site	<u>4/24/2019 10:30 AM</u>
Returned to Office	<u>4/24/2019 11:30 AM</u>

Daily Site Visit Report



Site Sketch



Daily Site Visit Report



Summary of Daily Operations

8:00 Picture documentation of Backfill Operation before and after

Next Steps & Recommendations

- 1** Complete closure report
- 2** Close file

Daily Site Visit Report

Site Photos

Viewing Direction: North



Descriptive Photo
Viewing Direction: North
Topic: Backfill area by well head
Created: 4/24/2019 8:40:18 AM
Lat:33.886528, Long:-104.132665

Backfill area by well head

Viewing Direction: North



Descriptive Photo
Viewing Direction: North
Topic: Backfill area by well head
Created: 4/24/2019 8:40:18 AM
Lat:33.886528, Long:-104.132665

Backfill area by well head

Viewing Direction: East



Descriptive Photo
Viewing Direction: East
Topic: Backfill area by well head
Created: 4/24/2019 8:41:17 AM
Lat:33.886528, Long:-104.132665

Backfill area by well head

Viewing Direction: South



Descriptive Photo
Viewing Direction: South
Topic: Backfill area by well head
Created: 4/24/2019 8:41:17 AM
Lat:33.886528, Long:-104.132665

Backfill area by well head

Daily Site Visit Report

Viewing Direction: Southeast  Description Photo Viewing Direction: Southeast Date: 4/24/2019 Camera: 42472113 4x4000 4.0 Lat: 33.0000, Long: -108.0000	Viewing Direction: East  Description Photo Viewing Direction: East Date: 4/24/2019 Camera: 42472113 4x4000 4.0 Lat: 33.0000, Long: -108.0000
Fill pile	Fill pile
Viewing Direction: North  Description Photo Viewing Direction: North Date: 4/24/2019 Camera: 42472113 4x4000 4.0 Lat: 33.0000, Long: -108.0000	Viewing Direction: North  Description Photo Viewing Direction: North Date: 4/24/2019 Camera: 42472113 4x4000 4.0 Lat: 33.0000, Long: -108.0000
Fill pile	Well head

Daily Site Visit Report

Viewing Direction: East  Geophysical Photo Viewing Direction: East Date: 4/24/2019 Created: 4/24/2019 10:40:34 AM Lat: 28.00000, Long: 104.122473 Well head	Viewing Direction: South  Geophysical Photo Viewing Direction: South Date: 4/24/2019 Created: 4/24/2019 10:40:34 AM Lat: 28.00000, Long: 104.122473 Well head
Viewing Direction: South  Geophysical Photo Viewing Direction: South Date: 4/24/2019 Created: 4/24/2019 10:40:34 AM Lat: 28.00000, Long: 104.122473 Well head	Viewing Direction: South  Geophysical Photo Viewing Direction: South Date: 4/24/2019 Created: 4/24/2019 10:40:34 AM Lat: 28.00000, Long: 104.122473 After backfill near well head

Daily Site Visit Report

Viewing Direction: Southeast



After backfill near well head

Viewing Direction: East



After backfill near well head

Viewing Direction: East



After backfill near well head

Viewing Direction: North



After backfill near well head

Daily Site Visit Report

Viewing Direction: Northwest



After backfill near well head

Viewing Direction: North



Fill pile completely used/ compacted

Viewing Direction: Southwest



Fill pile completely used/ compacted

Daily Site Visit Report



Daily Site Visit Signature

Inspector: Austin Harris

Signature:

A handwritten signature in black ink, appearing to be 'A. Harris', written over a horizontal line.

Signature

ATTACHMENT 4



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	POD Sub- Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
RA 12307 POD1	RA	ED		4	2	2	14	17S	28E	580495	3633981	1626	140	58	82

Average Depth to Water: **58 feet**

Minimum Depth: **58 feet**

Maximum Depth: **58 feet**

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 582120.9

Northing (Y): 3633946

Radius: 5000

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.



New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum)										(R=POD has been replaced and no longer serves this file, (quarters are 1=NW 2=NE 3=SW 4=SE) C=the file is closed) (quarters are smallest to largest) (NAD83 UTM in meters)											
WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q	q	q	4	Sec	Tws	Rng	X	Y	Distance	
RA 12307	RA	STK		3 KEY LIVESTOCK LLC	ED	RA 12307 POD1			NON	Shallow	4	2	2	14	17S	28E		580494	3633981		1626
RA 12052	RA	MON		0 CENTURION PIPELINE L.P.	ED	RA 12052 POD1					4	2	2	24	17S	28E		582117	3632226		1719
RA 08229	RA	STK	1.34	BOGLE FARMS	ED	RA 08229								02	17S	28E		579839	3636487*		3415
RA 08231	RA	STK	1.34	BOGLE FARMS	ED	RA 08231					3	3	23	17S	28E			579269	3631051*		4063
RA 08230	RA	STK	1.42	BOGLE FARMS	ED	RA 08230								22	17S	28E		578281	3631638*		4480

Record Count: 5

UTMNAD83 Radius Search (in meters):

Easting (X): 582120.9

Northing (Y): 3633946

Radius: 5000

Sorted by: Distance

*UTM location was derived from PLSS - see Help

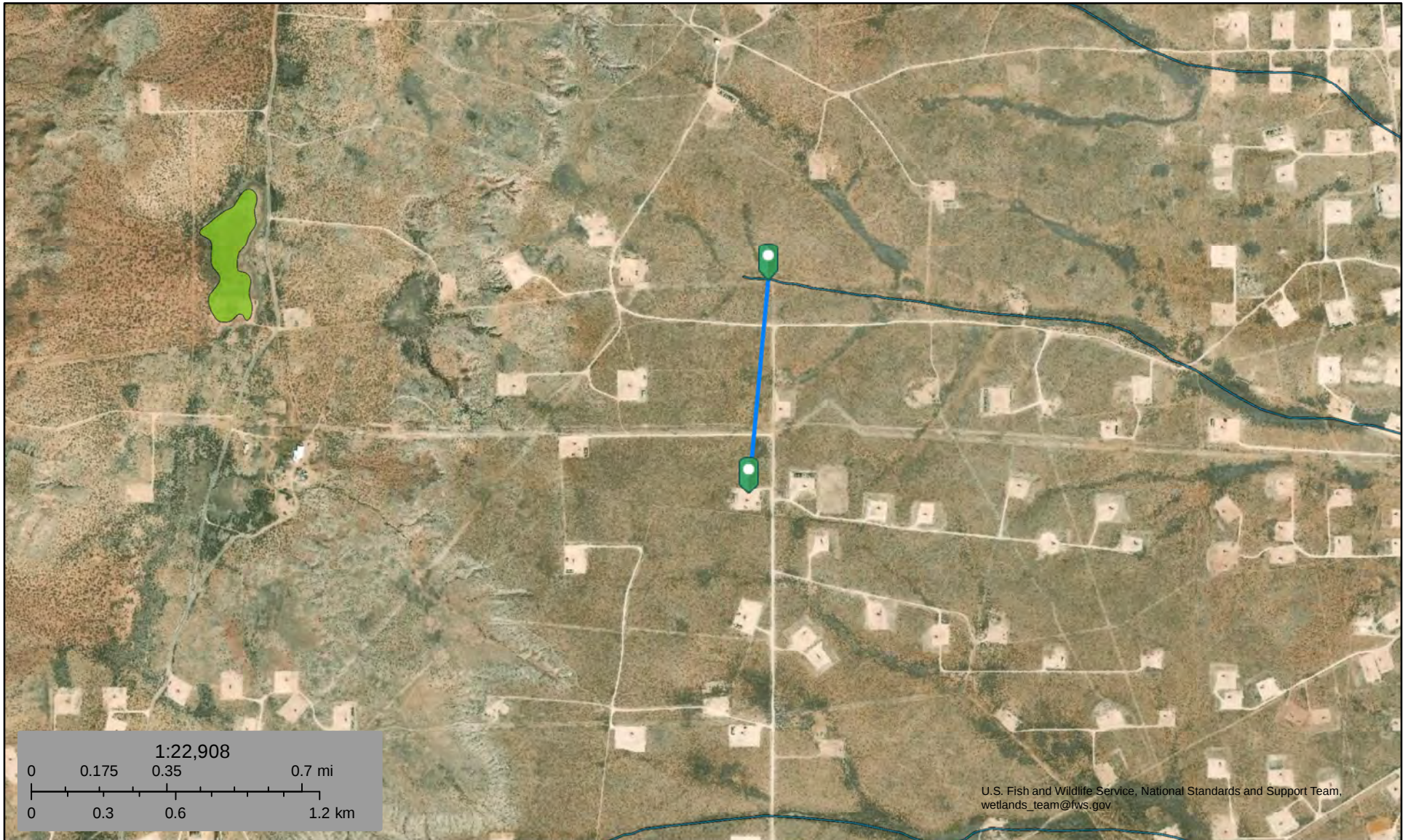
The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



U.S. Fish and Wildlife Service

National Wetlands Inventory

Aid State 008 Riverine 2450 feet



March 31, 2019

Wetlands



Estuarine and Marine Deepwater



Estuarine and Marine Wetland



Freshwater Emergent Wetland



Freshwater Forested/Shrub Wetland



Freshwater Pond



Lake



Other



Riverine

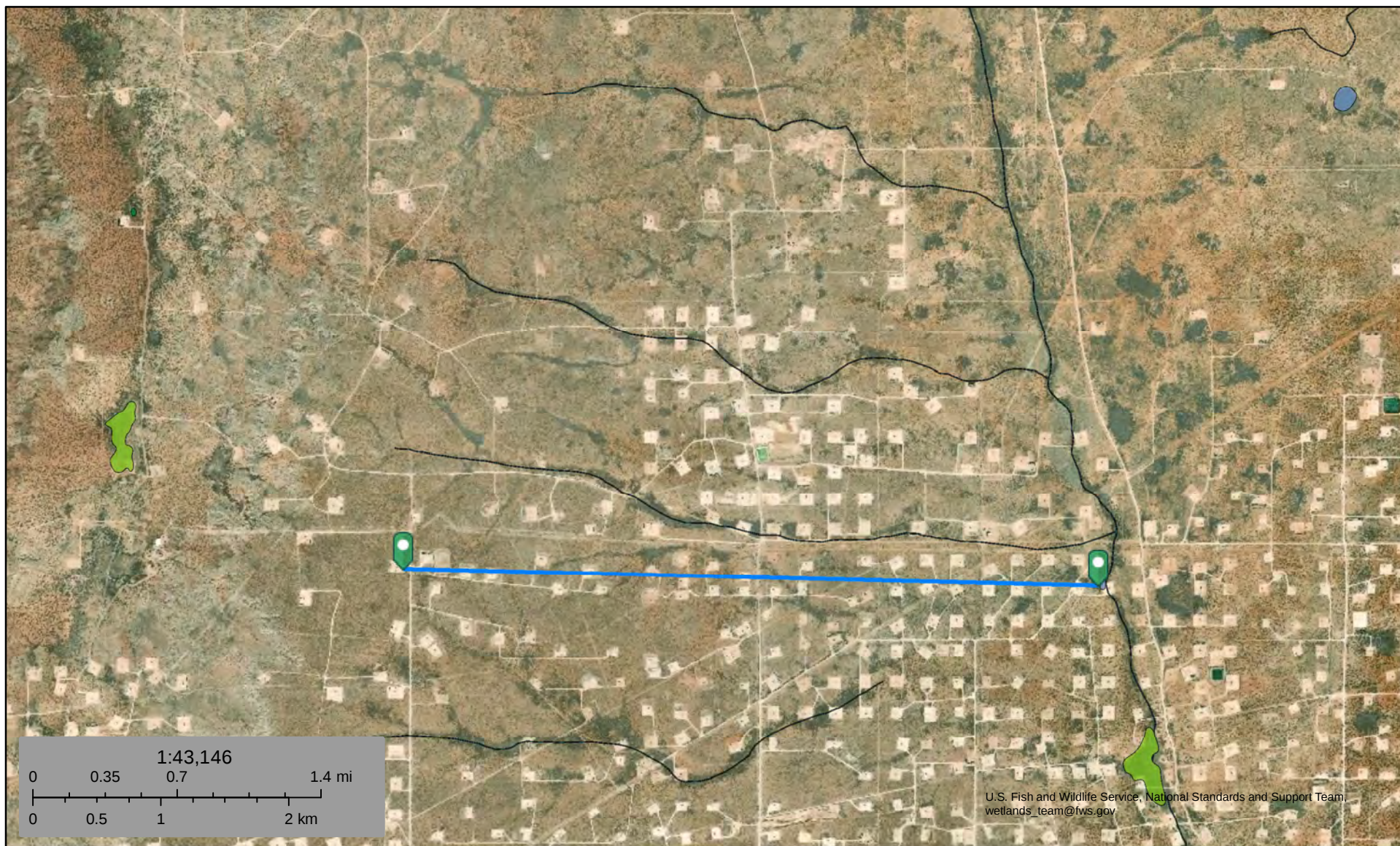
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



U.S. Fish and Wildlife Service

National Wetlands Inventory

Aid State 8 fresh water pond 15,005ft



U.S. Fish and Wildlife Service, National Standards and Support Team
wetlands_team@fws.gov

April 4, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

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

Aid State 008

Nearest Residence 4,968ft

Legend

 Feature 1

 Nearest Residence

 Aid State 008

209

209A

Google Earth

© 2018 Google



700 m

Aid State 008

Nearest Fresh Water Well 5,231ft

Legend

 Feature 1

 Fresh Water Well

 Aid State 008

209

209A

Turkey Tract Rd

Google Earth

© 2018 Google



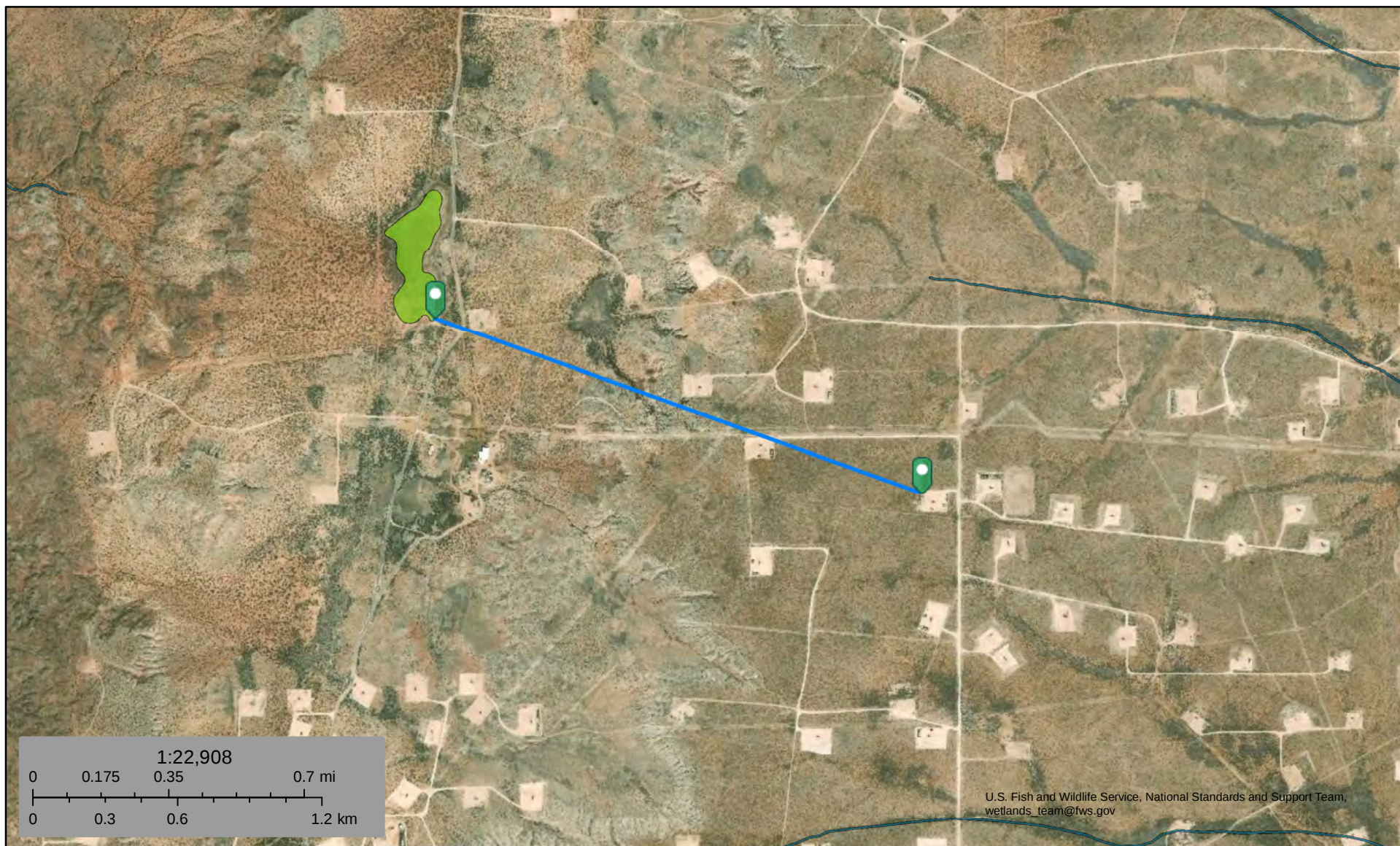
1 km



U.S. Fish and Wildlife Service

National Wetlands Inventory

Aid State 008 Wetland 5926 feet



U.S. Fish and Wildlife Service, National Standards and Support Team,
wetlands_team@fws.gov

March 31, 2019

Wetlands



Estuarine and Marine Deepwater



Estuarine and Marine Wetland



Freshwater Emergent Wetland



Freshwater Forested/Shrub Wetland



Freshwater Pond



Lake

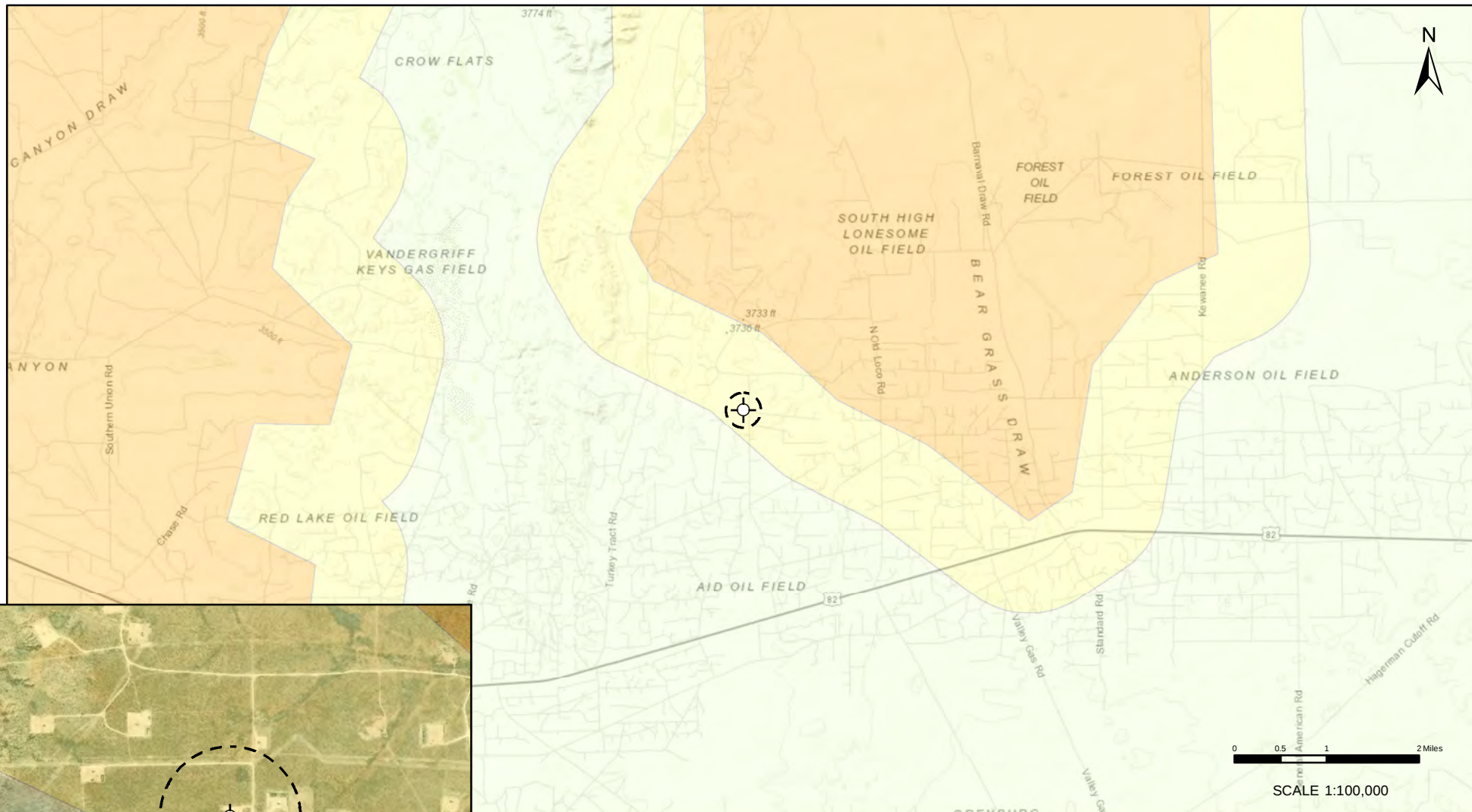


Other



Riverine

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



LEGEND

KARST POTENTIAL

- CRITICAL
- HIGH
- MEDIUM
- LOW



**Karst Potential
Aid State 008**



DRAWN: NM	FIGURE: 1
APPROVED: KM	
DATE: APRIL 1/19	

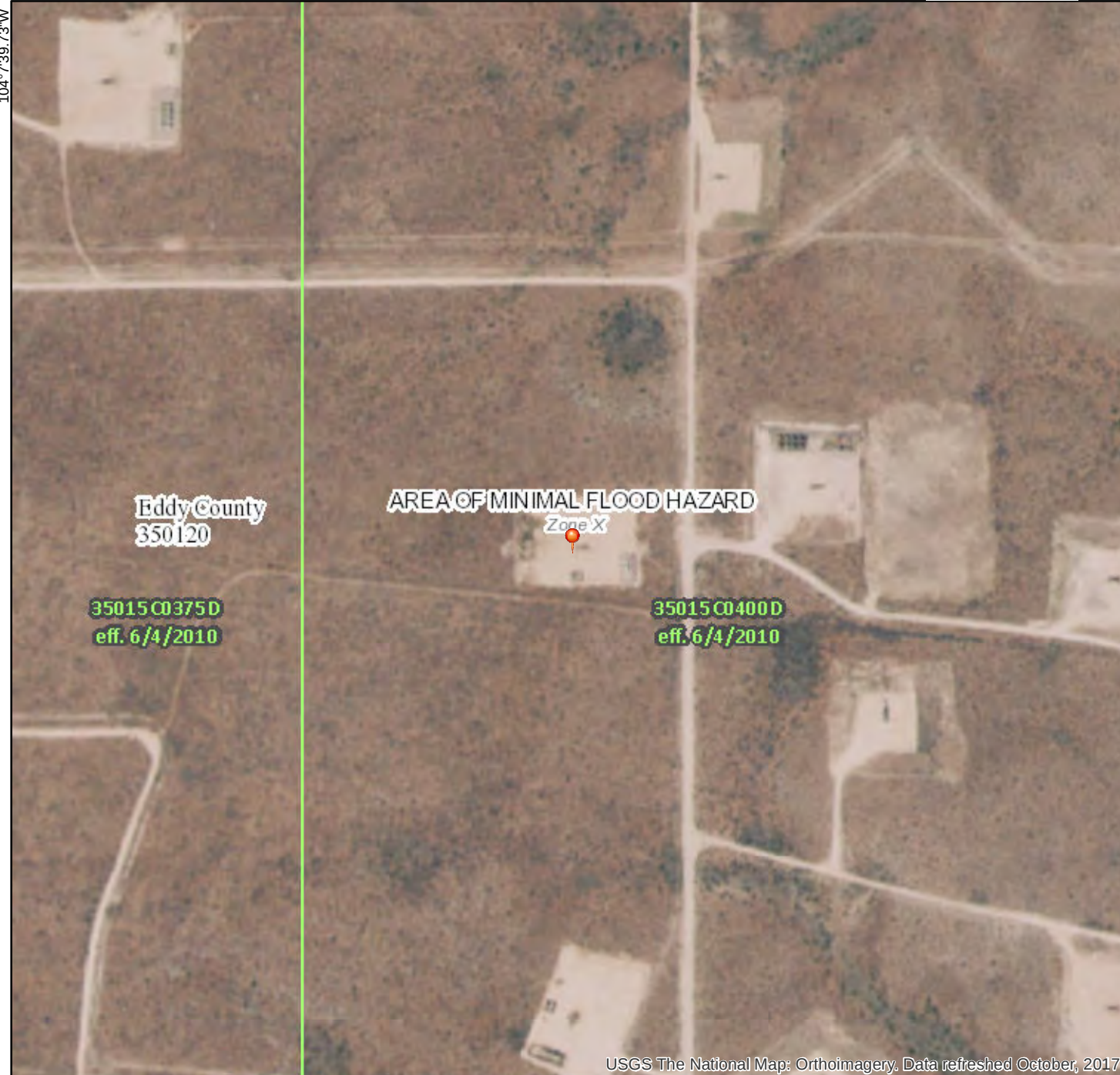
Notes: Aerial Image from ESRI Digital Globe 2017

VERSATILITY. EXPERTISE.

National Flood Hazard Layer FIRMette



32°50'40.91"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

32°50'10.69"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/31/2019 at 3:01:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

104°7'2.27"W



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Eddy Area, New Mexico



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Soil Map.....	9
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SG—Simona gravelly fine sandy loam, 0 to 3 percent slopes.....	13
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

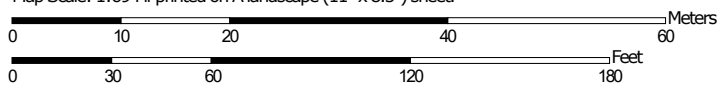
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:694 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 14, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 30, 2015—Dec 15, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SG	Simona gravelly fine sandy loam, 0 to 3 percent slopes	2.2	100.0%
Totals for Area of Interest		2.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eddy Area, New Mexico

SG—Simona gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5w
Elevation: 2,750 to 5,000 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Simona and similar soils: 95 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Simona

Setting

Landform: Alluvial fans, plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 19 inches: gravelly fine sandy loam
H2 - 19 to 23 inches: indurated

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow Sandy (R042XC002NM)
Hydric soil rating: No

Minor Components

Playa

Percent of map unit: 1 percent

Landform: Playas

Landform position (three-dimensional): Talf

Down-slope shape: Convex, concave

Across-slope shape: Linear, concave

Ecological site: Bottomland (R042XC017NM)

Hydric soil rating: Yes

Simona

Percent of map unit:

Ecological site: Shallow Sandy (R042XC002NM)

Hydric soil rating: No

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelpdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 5



BDS Enterprises, LLC.
2510 Monte Vista
Carlsbad, NM 88220

Invoice

Date	Invoice #
4/18/2019	109178

Bill To:
Vertex Resource Group, Ltd. 213 S Mesa Street Carlsbad, NM 88220

Terms
Net 30

Company Rep:	Asset #	MOE #	Project / Lease Name
Dennis Williams			AID STATE COM 008

Service Date	Ticket #	Qty	Item	Description	Rate	Amount
4/10/2019	96363	10	Belly Dump	Hauled Calilche from BDS N 80 pit to location.	90.00	900.00T
		24	Caliche	Belly Dump	9.00	216.00T
				Caliche		
4/11/2019	96366	5	Belly Dump	Hauled 1 load material to R360 for disposal. Ticket # 700-1000436	90.00	450.00T
				Belly Dump		

<i>Thank you for your business!</i> Phone # 575-689-8324			Sales Tax (5.9583%)	\$93.31
			Total	\$1,659.31

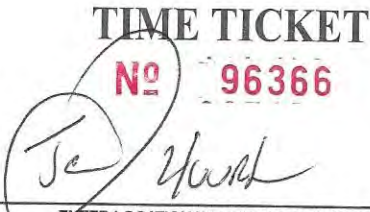


FAX:
575.689.8325

[illegible]

hauling 1 load caliche from	216'
North 80 to location	
24 yds caliche @ 9. ⁰⁰ /yd	
TOTAL	

Billy Thompson
CONTRACTOR SIGNATURE



FAX:
575.689.8325

[illegible]

hauling 1 load contaminate soil to Be R360 disposal	
<u> </u>	
TOTAL	

CUSTOMER SIGNATURE

Billy Thompson

CONTRACTOR SIGNATURE



Permian Basin

Customer: MARATHON OIL COMPANY
Customer #: CRI3930
Ordered by: CALLIE KARRIGAN
AFE #:
PO #:
Manifest #: 381599
Manif. Date: 4/11/2019
Hauler: BDS TRUCKING
Driver: BILLY
Truck #: 42
Card #
Job Ref #

Ticket #: 700-1000436
Bid #: O6UJ9A000AM5
Date: 4/11/2019
Generator: MARATHON OIL COMPANY
Generator #:
Well Ser. #: 38142
Well Name: AID STATE
Well #: 008
Field:
Field #:
Rig: NON-DRILLING
County: EDDY (NM)

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

7.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



NEW MEXICO NON-HAZARDOUS OILFIELD WASTE MANIFEST
(PLEASE PRINT)

Company Man Contact Information

Name _____

Phone No. _____

GENERATOR

NO. 381599

Operator No. _____

Operators Name Marathon Oil

Address 4161 S Tidwell Road

City, State, Zip Carlsbad NM 88220

Phone No. 405-202-1024

Permit/RRC No. 29500900

Lease/Well Name & No. And 5922 #008

County Eddy County

API No. 30-015-38142

Rig Name & No. _____

AFE/PO No. NM-0711

EXEMPT E&P Waste/Service Identification and Amount (place volume next to waste type in barrels or cubic yards)	
Oil Based Muds	NON-INJECTABLE WATERS
Oil Based Cuttings	Washout Water (Non-Injectable)
Water Based Muds	Completion Fluid/Flow back (Non-Injectable)
Water Based Cuttings	Produced Water (Non-Injectable)
Produced Formation Solids	Gathering Line Water/Waste (Non-Injectable)
Tank Bottoms	INTERNAL USE ONLY
E&P Contaminated Soil	Truck Washout (exempt waste)
Gas Plant Waste	INJECTABLE WATERS
	Washout Water (Injectable)
	Completion Fluid/Flow back (Injectable)
	Produced Water (Injectable)
	Gathering Line Water/Waste (Injectable)
	OTHER EXEMPT WASTES (type and generation process of the waste)

WASTE GENERATION PROCESS: ☐ DRILLING ☐ COMPLETION ☒ PRODUCTION ☐ GATHERING LINES

NON-EXEMPT E&P Waste/Service Identification and Amount (place volume next to waste type in barrels or cubic yards)

All non-exempt E&P waste must be analysed and be below the threshold limits for toxicity (TCDF), irritability, corrosivity and reactivity.

Non-Exempt Other _____ *please select from Non-Exempt Waste List on back

QUANTITY ☐ B - BARRELS ☐ L - LIQUID ☒ Y - YARDS ☐ E - EACH

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste load is (check the appropriate classification)

☒ RCRA EXEMPT: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste (R360 Accepts certifications on a per load basis only)

☐ RCRA NON-EXEMPT: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined by 40 CFR, part 261, subpart D, as amended. The following documentation demonstrating the waste as non-hazardous is attached. (Check the appropriate items as provided)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Other (Provide Description Below)

☐ EMERGENCY NON-OILFIELD: Emergency non-hazardous, non-oilfield waste that has been ordered by the Department of Public Safety (the order, documentation of non-hazardous waste determination and a description of the waste must accompany this form)

Callie Karrison For Dennis Williams / Vertex April 11 2019 [Signature]
(PRINT) AUTHORIZED AGENTS NAME DATE SIGNATURE

BDS TRANSPORTER

Transporter's Name Carlsbad NM Driver's Name Billy Thompson

Address _____ Print Name _____

Phone No. _____ Truck No. 42

I hereby certify that the above named material(s) was/were picked up at the Generator's site listed above and delivered without incident to the disposal facility listed below.

4-11-19 [Signature] 4/11
SHIPMENT DATE DRIVER'S SIGNATURE DELIVERY DATE DRIVER'S SIGNATURE

TRUCK TIME STAMP IN: _____ OUT: _____ DISPOSAL FACILITY RECEIVING AREA

Site Name/ Permit No. Halfway Facility / NM1-006 Phone No. 575-393-1079

Address 6601 Hobbs Hwy US 62/180 Mile Marker 66 Carlsbad, NM 88220

NORM READINGS TAKEN? (Circle One) YES ☐ NO ☒ If YES, was reading > 50 micro roentgens? (circle one) YES ☐ NO ☒

PASS THE PAINT FILTER TEST? (Circle One) YES ☐ NO ☒

TANK BOTTOMS

Feet _____ Inches _____

1st Gauge _____ 2nd Gauge _____

Received _____

BS&W/BBLS Received _____ Free Water _____ BS&W (%) _____

Total Received _____

I hereby certify that the above load material has been (circle one): ACCEPTED 4/11 DENIED NO If denied, why? [Signature]
NAME (PRINT) DATE FILE SIGNATURE

ATTACHMENT 6

Table 3. Soil Characterization - Salinity and Petroleum Hydrocarbon Parameters

Client Name: Marathon Oil LLC

Site Name: Aid State 8

Project #: 19E-00614

Lab Report(s): April 19, 2019

Table 3. Soil Analysis - April 10, 2019																		
Sample Description			Field Screening			Petroleum Hydrocarbons												Inorganic
Sample ID	Depth (in)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Quantab Result (High/Low)	Volatile							Extractable					
						Benzene	Toluene	Ethylbenzene	Xylenes (p&m)	Xylenes (o)	Xylenes (Total)	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Hydrocarbons (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	
			(ppm)	(ppm)	(+/-)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Chloride
SS 19-01	6	4/10/2019	4.9	75	High 2262	< 0.00201	< 0.00201	< 0.00201	< 0.00402	< 0.00201	< 0.00201	< 0.00201	< 15.0	3,200	745	3,215	3,950	22,100.0
SS 19-02	6	4/10/2019	4.5	107	High 570	< 0.00202	< 0.00202	< 0.00202	< 0.00404	< 0.00202	< 0.00202	< 0.00202	< 14.9	955	146	969.9	1,100	20,000.0
SS 19-03	6	4/10/2019	0.4	0	High ND	< 0.00198	< 0.00198	< 0.00198	< 0.00397	< 0.00198	< 0.00198	< 0.00198	< 15.0	63.1	15.6	78.1	78.7	3,310.0
SS 19-04	6	4/10/2019	N/A	N/A	N/A	< 0.00199	< 0.00199	< 0.00199	< 0.00398	< 0.00199	< 0.00199	< 0.00199	< 15.0	< 15.0	< 15.0	30	< 15.0	< 5.04

Bold and Shaded indicates exceedance outside of applied action level.

ATTACHMENT 7

From: [Dhugal Hanton](#)
To: [Bratcher, Mike, EMNRD](#); [Hamlet, Robert, EMNRD](#); [Venegas, Victoria, EMNRD \(Victoria.Venegas@state.nm.us\)](#)
Cc: [Callie Karrigan - Marathon Oil Permain LLC \(cnkarrigan@marathonoil.com\)](#); [Isaac Castro](#); [Dennis Williams](#)
Subject: Marathon Oil - Aid State #008 - Final Confirmatory Sampling Notification - RP Not Yet Assigned
Date: April 5, 2019 8:44:00 AM

Morning,

Please accept this email as 48 hr notification that Vertex Resource Services Inc. has scheduled final confirmatory sampling at the above mentioned location on April 9, 2019 at approximately 1:00 PM. Jason Crabtree from Vertex will be on site performing the sampling and can be reached at (432) 250-3456. If you need assistance with directions to site please do not hesitate to contact them.

If you have any other questions or concerns, please do not hesitate to contact me.

Cheers,
Dhugal

Dhugal Hanton B.Sc., P.Ag., SR/WA, P.Biol.
Vice President,
US Operations

Vertex Resource Services Inc.
7223 Empire Central Drive,
Houston, TX
77040

O 832-535-1585 Ext. 700
C 832-588-0674

ATTACHMENT 8



Certificate of Analysis Summary 620948

Marathon Oil Company, Tulsa, OK

Project Name: Aid State #008



Project Id: 19E-00614
Contact: Callie Karrigan
Project Location: Eddy County, New Mexico

Date Received in Lab: Fri Apr-12-19 11:25 am
Report Date: 19-APR-19
Project Manager: Kalei Stout

<i>Analysis Requested</i>	<i>Lab Id:</i>	620948-001	620948-002	620948-003	620948-004		
	<i>Field Id:</i>	SS19-01	SS19-02	SS19-03	SS19-04		
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL		
	<i>Sampled:</i>	Apr-10-19 12:00	Apr-10-19 12:05	Apr-10-19 12:10	Apr-10-19 12:15		
BTEX by EPA 8021B	<i>Extracted:</i>	Apr-17-19 13:00	Apr-17-19 13:00	Apr-17-19 13:00	Apr-17-19 13:00		
	<i>Analyzed:</i>	Apr-18-19 00:08	Apr-18-19 02:19	Apr-18-19 02:38	Apr-18-19 02:57		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Benzene		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
Toluene		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
Ethylbenzene		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
m,p-Xylenes		<0.00402 0.00402	<0.00404 0.00404	<0.00397 0.00397	<0.00398 0.00398		
o-Xylene		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
Total Xylenes		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
Total BTEX		<0.00201 0.00201	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199		
Inorganic Anions by EPA 300	<i>Extracted:</i>	Apr-18-19 17:00	Apr-17-19 19:00	Apr-17-19 19:00	Apr-17-19 19:00		
	<i>Analyzed:</i>	Apr-19-19 10:13	Apr-18-19 00:51	Apr-18-19 00:06	Apr-17-19 23:33		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		22100 250	20000 250	3310 50.4	<5.04 5.04		
TPH by SW8015 Mod	<i>Extracted:</i>	Apr-13-19 11:00	Apr-13-19 11:00	Apr-13-19 11:00	Apr-13-19 11:00		
	<i>Analyzed:</i>	Apr-14-19 10:09	Apr-14-19 02:50	Apr-14-19 03:10	Apr-14-19 03:30		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<14.9 14.9	<15.0 15.0	<15.0 15.0		
Diesel Range Organics (DRO)		3200 15.0	955 14.9	63.1 15.0	<15.0 15.0		
Motor Oil Range Hydrocarbons (MRO)		745 15.0	146 14.9	15.6 15.0	<15.0 15.0		
Total TPH		3950 15.0	1100 14.9	78.7 15.0	<15.0 15.0		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use.
The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented.
Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Kalei Stout
Midland Laboratory Director

Analytical Report 620948

for Marathon Oil Company

Project Manager: Callie Karrigan

Aid State #008

19E-00614

19-APR-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
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), North Carolina (483)
Xenco-Lakeland: Florida (E84098)



19-APR-19

Project Manager: **Callie Karrigan**

Marathon Oil Company

P. O. Box 22164

Tulsa, OK 74121-2164

Reference: XENCO Report No(s): **620948**

Aid State #008

Project Address: Eddy County, New Mexico

Callie Karrigan :

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) 620948. 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. 620948 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,

Kalei Stout

Midland Laboratory Director

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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



Sample Cross Reference 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SS19-01	S	04-10-19 12:00		620948-001
SS19-02	S	04-10-19 12:05		620948-002
SS19-03	S	04-10-19 12:10		620948-003
SS19-04	S	04-10-19 12:15		620948-004



CASE NARRATIVE

Client Name: Marathon Oil Company

Project Name: Aid State #008

Project ID: 19E-00614

Work Order Number(s): 620948

Report Date: 19-APR-19

Date Received: 04/12/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3086143 BTEX by EPA 8021B

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



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-01**
Lab Sample Id: 620948-001

Matrix: Soil
Date Collected: 04.10.19 12.00

Date Received: 04.12.19 11.25

Analytical Method: Inorganic Anions by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3086271

Prep Method: E300P

% Moisture:

Date Prep: 04.18.19 17.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	22100	250	mg/kg	04.19.19 10.13		50

Analytical Method: TPH by SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3085702

Prep Method: TX1005P

% Moisture:

Date Prep: 04.13.19 11.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.14.19 10.09	U	1
Diesel Range Organics (DRO)	C10C28DRO	3200	15.0	mg/kg	04.14.19 10.09		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	745	15.0	mg/kg	04.14.19 10.09		1
Total TPH	PHC635	3950	15.0	mg/kg	04.14.19 10.09		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	96	%	70-135	04.14.19 10.09		
o-Terphenyl	84-15-1	115	%	70-135	04.14.19 10.09		



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-01**
Lab Sample Id: 620948-001

Matrix: Soil
Date Collected: 04.10.19 12.00

Date Received: 04.12.19 11.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.17.19 13.00

Basis: Wet Weight

Seq Number: 3086143

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	04.18.19 00.08	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
Total BTEX		<0.00201	0.00201	mg/kg	04.18.19 00.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	99	%	70-130	04.18.19 00.08		
1,4-Difluorobenzene	540-36-3	104	%	70-130	04.18.19 00.08		



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-02**
Lab Sample Id: 620948-002

Matrix: Soil
Date Collected: 04.10.19 12.05

Date Received: 04.12.19 11.25

Analytical Method: Inorganic Anions by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3086191

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Date Prep: 04.17.19 19.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	20000	250	mg/kg	04.18.19 00.51		50

Analytical Method: TPH by SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3085702

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Date Prep: 04.13.19 11.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.14.19 02.50	U	1
Diesel Range Organics (DRO)	C10C28DRO	955	14.9	mg/kg	04.14.19 02.50		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	146	14.9	mg/kg	04.14.19 02.50		1
Total TPH	PHC635	1100	14.9	mg/kg	04.14.19 02.50		1

Surrogate

1-Chlorooctane

o-Terphenyl

Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
111-85-3	92	%	70-135	04.14.19 02.50	
84-15-1	107	%	70-135	04.14.19 02.50	



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-02**
Lab Sample Id: 620948-002

Matrix: Soil
Date Collected: 04.10.19 12.05

Date Received: 04.12.19 11.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.17.19 13.00

Basis: Wet Weight

Seq Number: 3086143

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	04.18.19 02.19	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
Total BTEX		<0.00202	0.00202	mg/kg	04.18.19 02.19	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	98	%	70-130	04.18.19 02.19		
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.18.19 02.19		



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-03**
Lab Sample Id: 620948-003

Matrix: Soil
Date Collected: 04.10.19 12.10

Date Received: 04.12.19 11.25

Analytical Method: Inorganic Anions by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3086191

Prep Method: E300P

% Moisture:

Date Prep: 04.17.19 19.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3310	50.4	mg/kg	04.18.19 00.06		10

Analytical Method: TPH by SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3085702

Prep Method: TX1005P

% Moisture:

Date Prep: 04.13.19 11.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.14.19 03.10	U	1
Diesel Range Organics (DRO)	C10C28DRO	63.1	15.0	mg/kg	04.14.19 03.10		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	15.6	15.0	mg/kg	04.14.19 03.10		1
Total TPH	PHC635	78.7	15.0	mg/kg	04.14.19 03.10		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	04.14.19 03.10	
o-Terphenyl	84-15-1	92	%	70-135	04.14.19 03.10	



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-03**
Lab Sample Id: 620948-003

Matrix: Soil
Date Collected: 04.10.19 12.10

Date Received: 04.12.19 11.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.17.19 13.00

Basis: Wet Weight

Seq Number: 3086143

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	04.18.19 02.38	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
Total BTEX		<0.00198	0.00198	mg/kg	04.18.19 02.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.18.19 02.38		
4-Bromofluorobenzene	460-00-4	102	%	70-130	04.18.19 02.38		



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-04**
Lab Sample Id: 620948-004

Matrix: Soil
Date Collected: 04.10.19 12.15

Date Received: 04.12.19 11.25

Analytical Method: Inorganic Anions by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3086191

Prep Method: E300P

% Moisture:

Date Prep: 04.17.19 19.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.04	5.04	mg/kg	04.17.19 23.33	U	1

Analytical Method: TPH by SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3085702

Prep Method: TX1005P

% Moisture:

Date Prep: 04.13.19 11.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.14.19 03.30	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.14.19 03.30	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.14.19 03.30	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.14.19 03.30	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	88	%	70-135	04.14.19 03.30	
o-Terphenyl	84-15-1	83	%	70-135	04.14.19 03.30	



Certificate of Analytical Results 620948



Marathon Oil Company, Tulsa, OK

Aid State #008

Sample Id: **SS19-04**
Lab Sample Id: 620948-004

Matrix: Soil
Date Collected: 04.10.19 12.15

Date Received: 04.12.19 11.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.17.19 13.00

Basis: Wet Weight

Seq Number: 3086143

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	04.18.19 02.57	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
Total BTEX		<0.00199	0.00199	mg/kg	04.18.19 02.57	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.18.19 02.57		
4-Bromofluorobenzene	460-00-4	98	%	70-130	04.18.19 02.57		

- 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



QC Summary 620948

Marathon Oil Company Aid State #008

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086191

MB Sample Id: 7676024-1-BLK

Matrix: Solid

LCS Sample Id: 7676024-1-BKS

Prep Method: E300P

Date Prep: 04.17.19

LCSD Sample Id: 7676024-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	249	100	252	101	90-110	1	20	mg/kg	04.17.19 23:20	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086271

MB Sample Id: 7676095-1-BLK

Matrix: Solid

LCS Sample Id: 7676095-1-BKS

Prep Method: E300P

Date Prep: 04.18.19

LCSD Sample Id: 7676095-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	240	96	237	95	90-110	1	20	mg/kg	04.19.19 08:12	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086191

Parent Sample Id: 620782-002

Matrix: Soil

MS Sample Id: 620782-002 S

Prep Method: E300P

Date Prep: 04.17.19

MSD Sample Id: 620782-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	279	250	514	94	507	91	90-110	1	20	mg/kg	04.18.19 17:07	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086191

Parent Sample Id: 620948-004

Matrix: Soil

MS Sample Id: 620948-004 S

Prep Method: E300P

Date Prep: 04.17.19

MSD Sample Id: 620948-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2.16	252	254	100	258	102	90-110	2	20	mg/kg	04.17.19 23:40	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086271

Parent Sample Id: 620911-011

Matrix: Soil

MS Sample Id: 620911-011 S

Prep Method: E300P

Date Prep: 04.18.19

MSD Sample Id: 620911-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	3.22	250	274	108	274	108	90-110	0	20	mg/kg	04.19.19 08:32	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



QC Summary 620948

Marathon Oil Company Aid State #008

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3086271

Parent Sample Id: 620983-003

Matrix: Soil

MS Sample Id: 620983-003 S

Prep Method: E300P

Date Prep: 04.18.19

MSD Sample Id: 620983-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	202	252	408	82	404	80	90-110	1	20	mg/kg	04.19.19 10:39	X

Analytical Method: TPH by SW8015 Mod

Seq Number: 3085702

MB Sample Id: 7675751-1-BLK

Matrix: Solid

LCS Sample Id: 7675751-1-BKS

Prep Method: TX1005P

Date Prep: 04.13.19

LCSD Sample Id: 7675751-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	960	96	936	94	70-135	3	20	mg/kg	04.13.19 19:19	
Diesel Range Organics (DRO)	<8.13	1000	978	98	969	97	70-135	1	20	mg/kg	04.13.19 19:19	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	107		123		120		70-135	%	04.13.19 19:19
o-Terphenyl	108		119		115		70-135	%	04.13.19 19:19

Analytical Method: TPH by SW8015 Mod

Seq Number: 3085702

Parent Sample Id: 621017-001

Matrix: Soil

MS Sample Id: 621017-001 S

Prep Method: TX1005P

Date Prep: 04.13.19

MSD Sample Id: 621017-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<7.99	998	911	91	887	89	70-135	3	20	mg/kg	04.13.19 20:18	
Diesel Range Organics (DRO)	<8.11	998	920	92	937	94	70-135	2	20	mg/kg	04.13.19 20:18	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	118		117		70-135	%	04.13.19 20:18
o-Terphenyl	114		110		70-135	%	04.13.19 20:18

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Marathon Oil Company
Aid State #008

Analytical Method: BTEX by EPA 8021B

Seq Number: 3086143

MB Sample Id: 7676058-1-BLK

Matrix: Solid

LCS Sample Id: 7676058-1-BKS

Prep Method: SW5030B

Date Prep: 04.17.19

LCSD Sample Id: 7676058-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000388	0.101	0.0880	87	0.0926	93	70-130	5	35	mg/kg	04.17.19 19:25	
Toluene	<0.000459	0.101	0.0889	88	0.0930	93	70-130	5	35	mg/kg	04.17.19 19:25	
Ethylbenzene	<0.000569	0.101	0.0822	81	0.0855	86	70-130	4	35	mg/kg	04.17.19 19:25	
m,p-Xylenes	<0.00102	0.202	0.162	80	0.169	85	70-130	4	35	mg/kg	04.17.19 19:25	
o-Xylene	<0.000347	0.101	0.0814	81	0.0853	85	70-130	5	35	mg/kg	04.17.19 19:25	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	91		99		100		70-130	%	04.17.19 19:25
4-Bromofluorobenzene	86		89		90		70-130	%	04.17.19 19:25

Analytical Method: BTEX by EPA 8021B

Seq Number: 3086143

Parent Sample Id: 621042-001

Matrix: Soil

MS Sample Id: 621042-001 S

Prep Method: SW5030B

Date Prep: 04.17.19

MSD Sample Id: 621042-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000385	0.100	0.0829	83	0.0729	73	70-130	13	35	mg/kg	04.17.19 20:03	
Toluene	<0.000456	0.100	0.0826	83	0.0722	73	70-130	13	35	mg/kg	04.17.19 20:03	
Ethylbenzene	<0.000565	0.100	0.0754	75	0.0653	66	70-130	14	35	mg/kg	04.17.19 20:03	X
m,p-Xylenes	<0.00101	0.200	0.149	75	0.128	64	70-130	15	35	mg/kg	04.17.19 20:03	X
o-Xylene	<0.000344	0.100	0.0756	76	0.0659	66	70-130	14	35	mg/kg	04.17.19 20:03	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		99		70-130	%	04.17.19 20:03
4-Bromofluorobenzene	99		95		70-130	%	04.17.19 20:03

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference $[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD ResultMS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Analysis Request of Chain of Custody Record

1026948

Client Name: Marathon Oil Company		Site Manager: Callie Karrigan	
Project Name: Aid State #008			
Project Location: Eddy County, New Mexico		Project #: 19E-00614	
Invoice to: Callie Karrigan (cnkarrigan@marathonoil.com)			
Receiving Laboratory: Xenco Midland, Texas		Sampler Signature: 	
Comments: Send results to (cnkarrigan@marathonoil.com, permian@vertex.ca, lcastro@marathonoil.com)			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION		SAMPLING		MATRIX		PRESERVATIVE METHOD				# CONTAINERS		ANALYSIS REQUEST (Circle or Specify Method No.)
			DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE	FILTERED (Y/N)			
											YEAR		
SS19-01			April 10 2019	12:00	X			X				1 N	BTEX 8021B BTEX 8260B
SS19-02			April 10 2019	12:05	X			X				1 N	TPH TX1005 (Ext to C35)
SS19-03			April 10 2019	12:10	X			X				1 N	TPH 8015M (GRO - DRO - MRO)
SS19-04			April 10 2019	12:15	X			X				1 N	PAH 8270C
												1 N	Total Metals Ag As Ba Cd Cr Pb Se Hg
												1 N	TCLP Metals Ag As Ba Cd Cr Pb Se Hg
												1 N	TCLP Volatiles
												1 N	TCLP Semi Volatiles
												1 N	RCI
												1 N	GC/MS Vol. 8260B / 624
												1 N	GC/MS Semi. Vol. 8270C/625
												1 N	PCB's 8082 / 608
												1 N	NORM
												1 N	PLM (Asbestos)
												1 N	Chloridem (method 300)
												1 N	Chloride Sulfate TDS
												1 N	General Water Chemistry (see attached list)
												1 N	Anion/Cation Balance
												1 N	Hold

Relinquished by: Jason Crabtree	Date: April 10, 2019	Time: 3:30pm	Received by: Dennis Williams	Date: April 10, 2019	Time: 3:30 PM
Relinquished by:	Date:	Time:	Received by: 	Date: 4/12/19	Time: 1054
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

ORIGINAL COPY

LAB USE ONLY Sample Temperature 0.5/64 0.1/28	☐ RUSH: Same Day 24 hr 48 hr 72 hr ☐ Rush Charges Authorized ☐ Special Report Limits or TRRP Report
	REMARKS:

(Circle) HAND DELIVERED FEDEX UPS Tracking #: 7749512844060

ORIGIN ID:CAOA (575) 887-6245 XENCO PAC N MAIL 910 W PIERCE ST CARLSBAD, NM 88220 UNITED STATES US		SHIP DATE: 11APR19 ACTWGT: 25.00 LB CAD: 101813706/NET14100 DIMS: 19x14x17 IN
TO HOLD FOR XENCO FEDEX EXPRESS SHIP CENTER FEDEX SHIP CENTER 3600 COUNTY RD 1276 S MIDLAND TX 79711 (806) 794-1296 INV. REF. PO. DEPT.		
BILL RECIPIENT		

TRK# 7749 5128 4060
 0201
41 MAFA
 TX-US LBB
 MAFA
 LBB

FRI - 12 APR HOLD
 STANDARD OVERNIGHT
 HLD



J191618610701ur

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Marathon Oil Company

Date/ Time Received: 04/12/2019 11:25:42 AM

Work Order #: 620948

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)?	.4
#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

Brianna Teel

Date: 04/12/2019

Checklist reviewed by:

Kalei Stout

Kalei Stout

Date: 04/12/2019