May 17, 2019 Vertex Project #: 19E-00614-007

Spill Closure Report: Taylor Deep 12 Federal #009 (Section 12, Township 18 South, Range 31 East)
API: 30-015-39764
County: Eddy
Incident Report: 2RP-5349

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

New Mexico Oil Conservation Division - District 2 - Artesia
811 S. 1st Street
Artesia, New Mexico 88210

Marathon Oil Company LLC retained Vertex Resource Services Inc. (Vertex) to conduct a Spill Assessment for a release of crude oil caused by equipment failure of the rubber on the tube gauging on the well head at Taylor Deep 12 Federal #009, API 30-015-39764, Incident 2RP-5349 (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 32.76240, W 103.81660.

Background Information

The site is located approximately 34 miles northeast of Carlsbad, New Mexico. The legal location for the site is Section 12, Township 18 South and Range 31 East in Eddy County, New Mexico. The spill area is located on Bureau of Land Management (BLM) property. 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 Pqm ---- Quartermaster Formation (Upper Permian) and is characterized as red sandstone and siltstone. Predominant soil texture on the site is fine sand.

Incident Description

A spill occurred on March 30, 2019, due to rubber on the tube gauge failing. The spill was reported March 31, 2019 and involved the release of approximately 11 barrels (bbls) of produced oil on the pad site. The New Mexico Oil Conservation Division (NMOCD) C-141 Report: 2RP-5349 is included in Attachment 2. The Daily Field Reports (DFRs) and 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 430 feet below

ground surface (bgs) and 5,787 feet from the spill location. Documentation used in Closure Criteria Determination research is included in Attachment 4.

Table 1. Closure Criteria Determination			
Site Name: Taylor Deep 12 Federal #009			
Spill Coordinates: 32.76240, -103.81660			
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater	**430**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	415	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	16182	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	36473	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**	5787	feet
	ii) Within 1000 feet of any fresh water well or spring	5787	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	16182	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low
10	Within a 100-year Floodplain	>500	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria		>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**
> 100 feet	Chloride	20,000 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 53 feet long and 30 feet wide; the total affected area was determined to be 888 square feet. The DFR associated with the site is included in Attachment 3.

Remediation efforts began on April 4, 2019 and was completed on April 4, 2019. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on a total of five (5) sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), a Dexsil 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 to a depth of 0.5 feet 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 Attachment 6, as well as in the DFRs presented in Attachment 3.

Notification that confirmatory samples were being collected was provided to the NMOCD on April 10, 2019 and are included in Attachment 7. Confirmatory composite samples were collected from the base and walls of the excavation in 200 square foot increments. A total of four (4) samples, including two (2) background samples, 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 8015 MOD) and Total Chlorides (EPA Method 300.0). Laboratory results of this analysis are presented in Table 3, Attachment 6. All confirmatory samples collected and analyzed were below closure criteria for the site.

Closure Request

The spill area was fully delineated, remediated and backfilled with local soils by April 27, 2019 (Attachment 7). Confirmatory samples were analyzed by the laboratory and found to be below allowable concentrations as per the New Mexico Administrative Code Closure Criteria for Soils Impacted by a Release locations “greater than 100 feet to groundwater”. Based on these findings, Marathon Oil Company 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: 2RP-5222
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.

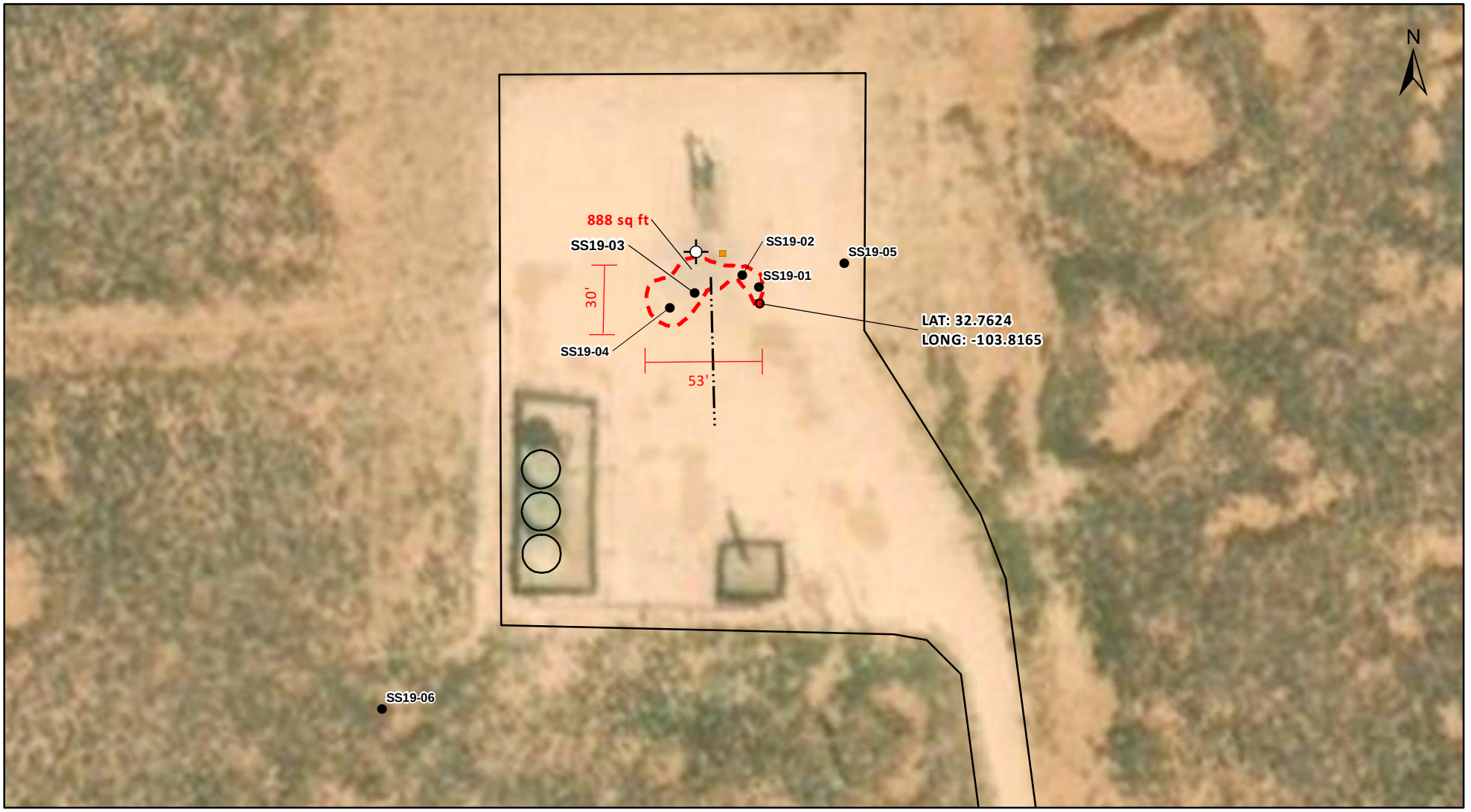
13. *Soil Survey, New Mexico*. United States Department of Agriculture, Soil Conservation Service in Cooperation with New Mexico Agricultural Experiment Station. (1971). Retrieved from http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/Chugg%20et%20al%201971%20w-map.pdf

Limitations

This report has been prepared for the sole benefit of Marathon Oil Company 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 Company 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
- METAL SIGN PIPE
- SOIL SAMPLE
- ROAD
- METAL PIPE
- SPILL AREA
- TANK

Notes: Aerial Image from ESRI Digital Globe 2017

0 37.5 75 150 ft

SCALE 1:800

Marathon Oil

Site Schematic
Taylor Deep 12
Federal #009

VERTEX

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

FIGURE: **1**

VERSATILITY. EXPERTISE.

Document Path: \\vtx-s-fs01.corp.internal\shared\vps\04 - Geomatics\1-Projects_US PROJECTS\Marathon\Figure 1 Site Schematic Taylor Deep 12 Federal #009.mxd

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	NAB1910757671
District RP	2RP-5349
Facility ID	
Application ID	pAB1910757368

Release Notification

Responsible Party

Responsible Party Marathon Oil Permian LLC	OGRID 372098
Contact Name Callie Karrigan	Contact Telephone 575-297-0956
Contact email cnkarrigan@marathonoil.com	Incident # *(assigned by OCD)* NAB1910757671
Contact mailing address 4111 Tidwell Road, Carlsbad New Mexico, 88220	

Location of Release Source

Latitude 32.7623863 Longitude -103.816597
(NAD 83 in decimal degrees to 5 decimal places)

Site Name TAYLOR DEEP 12 FEDERAL #009	Site Type Oil and gas drilling facility
Date Release Discovered 3/30/19	API# *(if applicable)* 30-015-39764

Unit Letter	Section	Township	Range	County
H	12	18S	31E	Eddy

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) 11.13	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
Operator reported a spill do to the rubber on top of a tubing gauge failing.

State of New Mexico
Oil Conservation Division

Incident ID	NAB1910757671
District RP	2RP-5349
Facility ID	
Application ID	pAB1910757368

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)?

Yes via email to Mike Bratcher, Victoria Venegas, Robert Hamlet, Jim Amos on 3/31/19 12:21 pm

Initial Response

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

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

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

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

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

Printed Name: Isaac Castro Title: Adv HES Tech

Signature: Isaac Castro Date: 4/3/19

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

OCD Only

Received by: Amalia Barrameda Date: 4/17/2019

ATTACHMENT 3

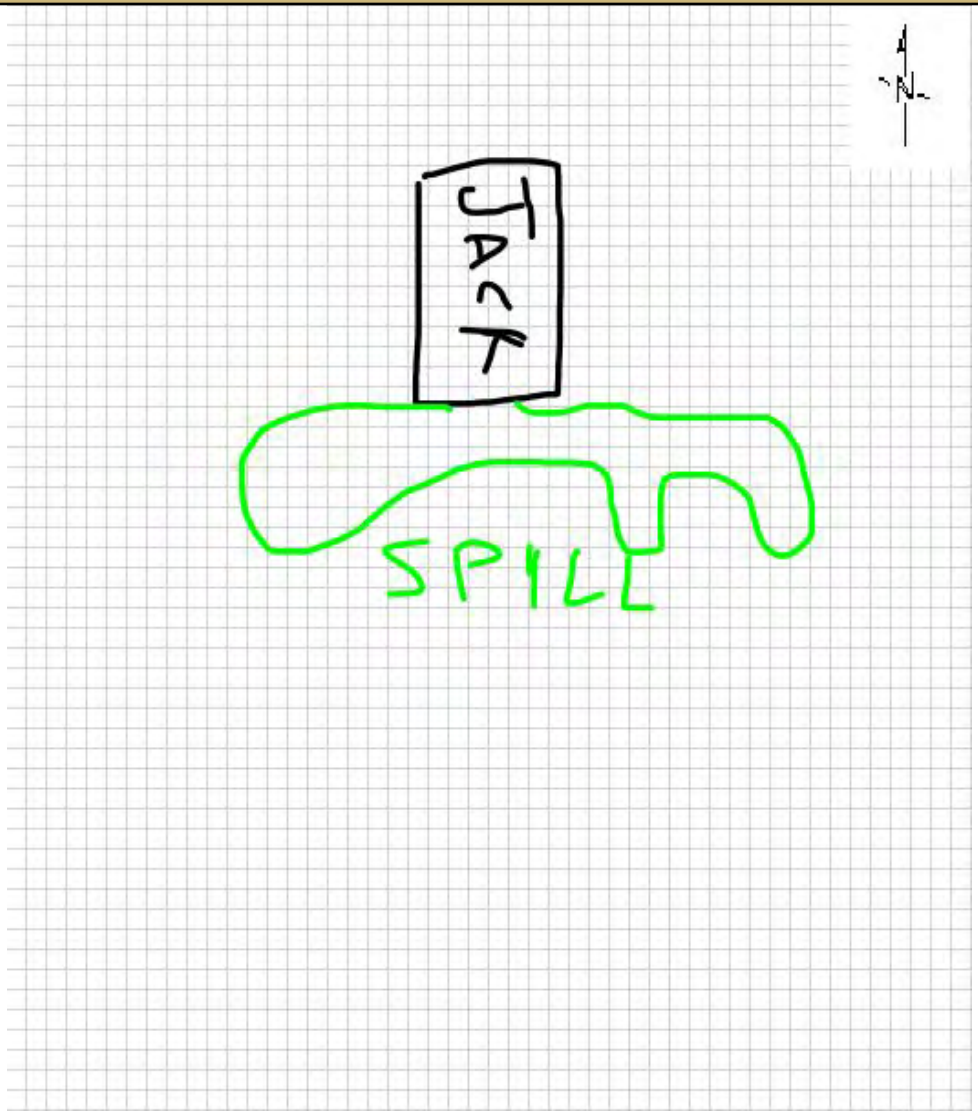
Daily Site Visit Report

Client:	Marathon Oil Permian LLC	Inspection Date:	3/31/2019
Site Location Name:	taylor deep 12 federal 009 marathon oil permian llc	Report Run Date:	4/1/2019 5:00 PM
Project Owner:	Isaac Castro	File (Project) #:	19E-00614
Project Manager:	Dennis Williams	API #:	30-015-39764
Client Contact Name:	Callie Karrigan	Reference	Tubing Line Failure
Client Contact Phone #:	(405) 202-1028		

Summary of Times	
Left Office	3/31/2019 4:00 PM
Arrived at Site	3/31/2019 5:32 PM
Departed Site	3/31/2019 6:10 PM
Returned to Office	3/31/2019 7:05 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

17:33 Locate spill
Map spill with GPS
Take pictures of spill

Next Steps & Recommendations

1 Send GPS map to create spill map

2 Send report to client

Daily Site Visit Report

Site Photos

Viewing Direction: West

Spill near well head

Viewing Direction: Southwest

Spill near well head

Viewing Direction: West

Spill near well head

Viewing Direction: North

Spill near well head

Daily Site Visit Report

Viewing Direction: North

Spill near well head

Viewing Direction: North

Spill near well head

Viewing Direction: East

Spill near well head

Viewing Direction: Southeast

Spill near well head

Daily Site Visit Report

Viewing Direction: East

Spill near well head

Daily Site Visit Report

Daily Site Visit Signature

Signature of Inspector:

Signature

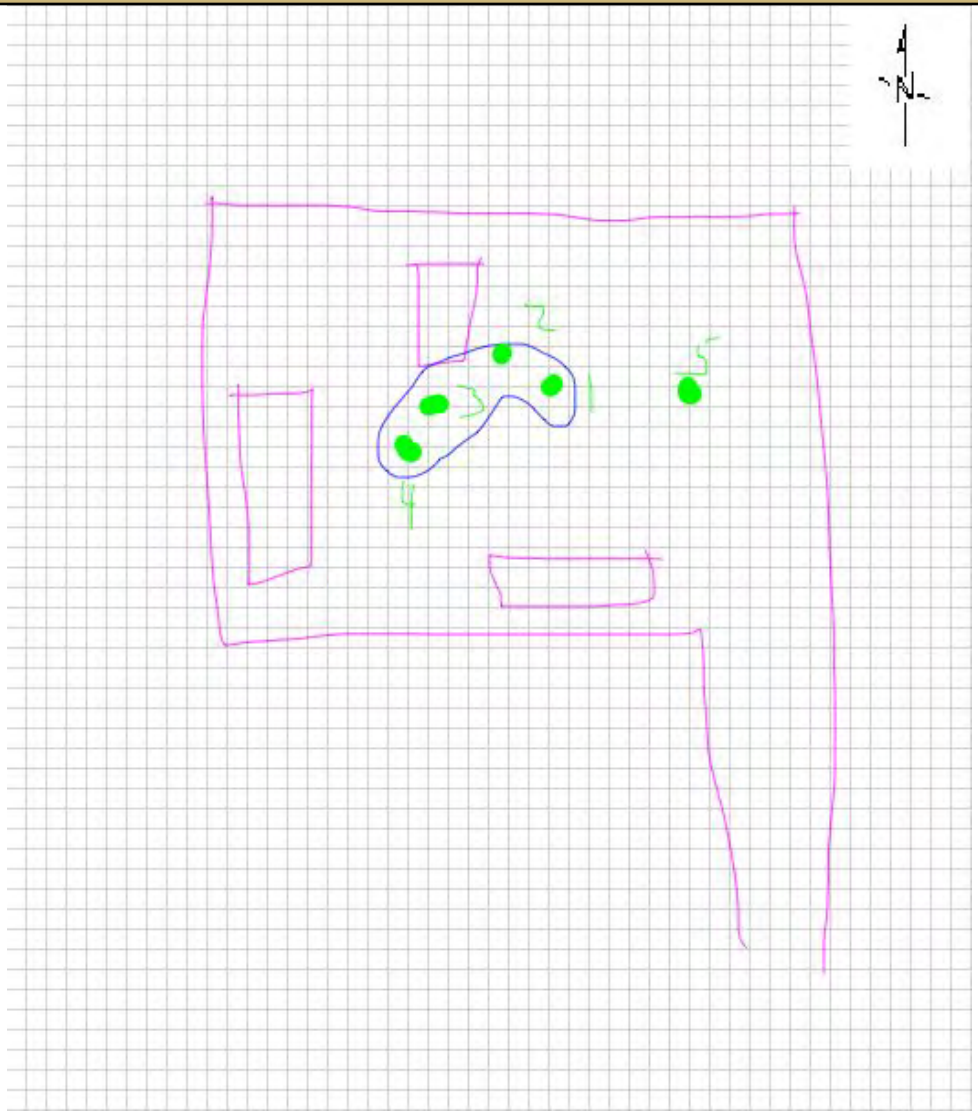
Daily Site Visit Report

Client:	Marathon Oil Permian LLC	Inspection Date:	4/4/2019
Site Location Name:	Taylor Deep 12 Federal #009	Report Run Date:	4/5/2019 2:06 PM
Project Owner:	Isaac Castro	File (Project) #:	19E-00614
Project Manager:	Dennis Williams	API #:	30-015-39764
Client Contact Name:	Callie Karrigan	Reference	Tubing Line Failure
Client Contact Phone #:	(405) 202-1028		

Summary of Times	
Left Office	4/4/2019 8:10 AM
Arrived at Site	4/4/2019 9:20 AM
Departed Site	4/4/2019 4:23 PM
Returned to Office	4/4/2019 6:12 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

9:23 Arrive on site and complete all safety paperwork and arrival form.

10:04 Complete safety meeting.

10:05 Excavation of spill area and soil sampling 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.	10 ppm	7 ppm	High (300-6000ppm)	295 ppm		✓	32.45'44.602", -103.48'59.392"	Yes
1 ft.	10 ppm	7 ppm	High (300-6000ppm)	295 ppm		✓	32.45'44.602", -103.48'59.392"	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.	14 ppm	9 ppm	High (300-6000ppm)	0 ppm		✓	32.45'44.659", -103.48'59.483"	Yes

Daily Site Visit Report

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.	33 ppm	247 ppm	High (300-6000ppm)	904 ppm		✓	32.45’44.578”, -103.48’59.743”	Yes

SS19-04

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	621 ppm	Low (30-600 ppm)	828 ppm		✓	32.45’44.514, -103.48’59.879”	Yes

SS19-05

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.	2 ppm	14 ppm	High (300-6000ppm)	0 ppm		✓	32.45’44.708”, -103.48’58.925”	Yes

Daily Site Visit Report

Site Photos

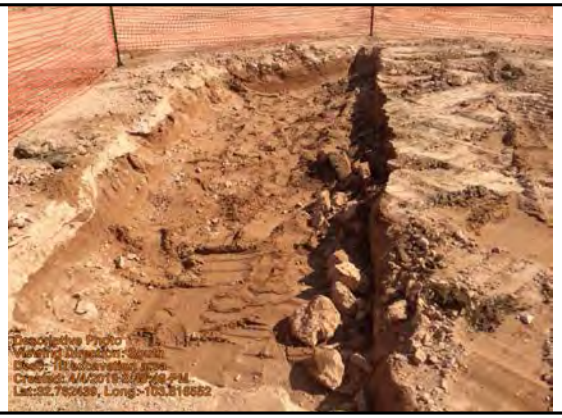
Viewing Direction: South	**Viewing Direction**: Southeast
	
Hand excavation of flow line	Power line
Viewing Direction: Southeast	**Viewing Direction**: West
	
Power-line pot holed	Excavation area

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: East
	
Excavation area	Excavation area
Viewing Direction: South	**Viewing Direction**: West
	
Soil pile 21ft x 18ft x 1ft	Soil pile 21ft x 18ft x 1ft

Daily Site Visit Report

Viewing Direction: South



1ft excavation area

Viewing Direction: East

Excavation area fenced off

Viewing Direction: North

Excavation area fenced off.

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: SS19-02

Depth: 0ft.

Sample Point ID: SS19-01

Depth: 1ft.

Sample Point ID: SS19-05

Depth: 0ft.

Sample Point ID: SS19-04

Depth: 0ft.

Daily Site Visit Report

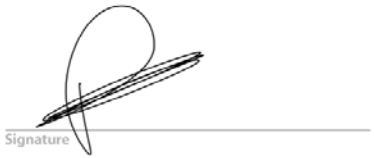
Sample Point ID: SS19-03

Depth: 0ft.

Daily Site Visit Report

Daily Site Visit Signature

Signature of Inspector:



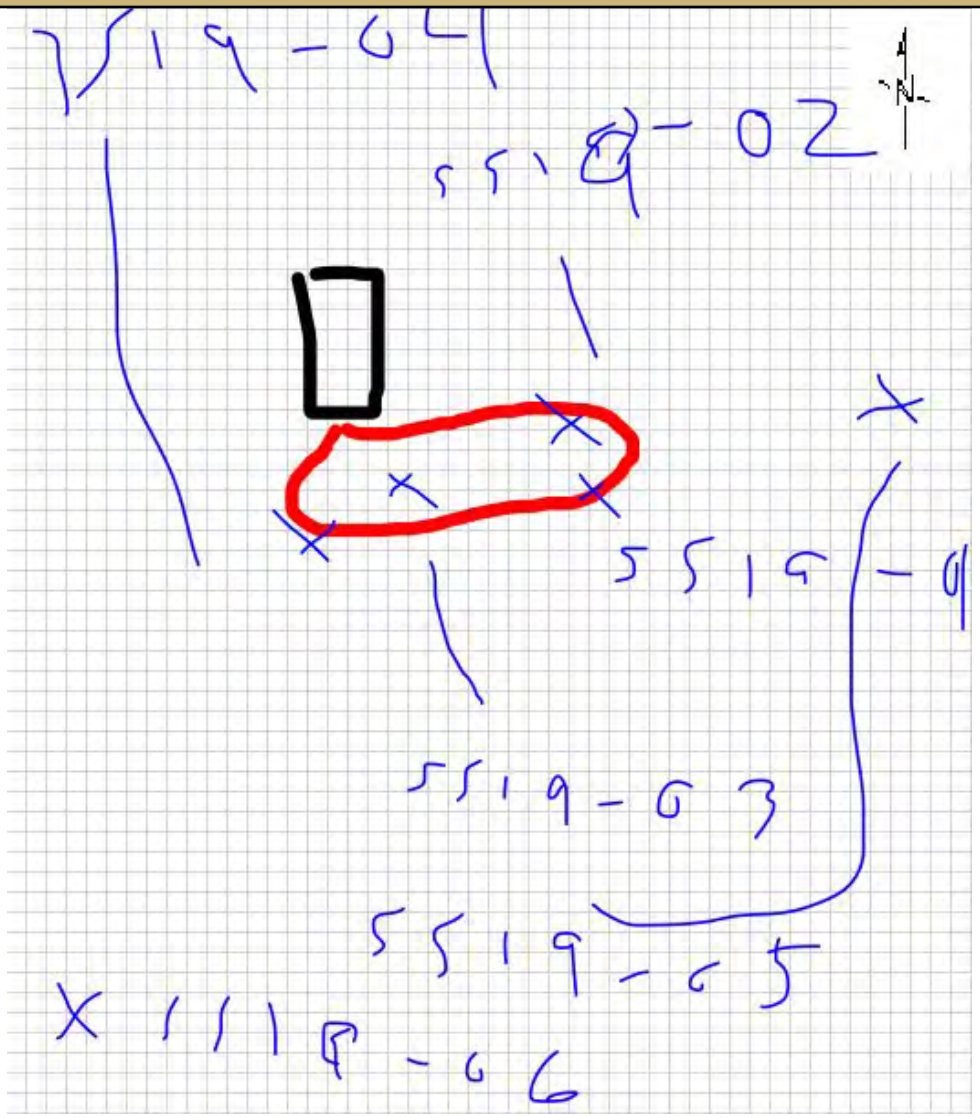
Daily Site Visit Report

Client:	Marathon Oil Permian LLC	Inspection Date:	4/10/2019
Site Location Name:	Taylor Deep 12 Federal #009	Report Run Date:	4/10/2019 9:12 PM
Project Owner:	Isaac Castro	File (Project) #:	19E-00614
Project Manager:	Dennis Williams	API #:	30-015-39764
Client Contact Name:	Callie Karrigan	Reference	Tubing Line Failure
Client Contact Phone #:	(405) 202-1028		

Summary of Times	
Left Office	4/10/2019 7:45 AM
Arrived at Site	4/10/2019 8:53 AM
Departed Site	4/10/2019 11:00 AM
Returned to Office	4/10/2019 12:12 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

8:55 Arrive on site
Fill out arrival and safety forms
Fill out waste manifest
Have contaminated soil hauled off
Collect confirmation samples
Fill out DFR
Take pictures
Head back to office
Ship samples

Next Steps & Recommendations

1 Ship samples

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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'44.602" N, 103°48'59.392" W	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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'44.659" N, 103°48'59.483" W	Yes

Daily Site Visit Report

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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'44.578" N, 103°48'59.743" W	Yes

SS19-04

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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'44.514" N, 103°48'59.879" W	Yes

SS19-05

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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'44.708" N, 103°48'58.925" W	Yes

SS19-06

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.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32°45'42.673"N, 103°49'01.476"W	Yes

Daily Site Visit Report

Site Photos

Viewing Direction: North

Contaminated soil

Viewing Direction: East

Excavation

Viewing Direction: North

Loading contaminated soil into truck

Viewing Direction: Northeast

Contaminated soil pile loaded into belly dump

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: West
	
Clean fill dirt	SS19-05
Viewing Direction: Northeast	**Viewing Direction**: North
	
SS19-04	SS19-03

Daily Site Visit Report

Viewing Direction: North

SS19-02

Viewing Direction: North

SS19-01

Viewing Direction: North

Clean fill dirt pile

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: SS19-05

Depth: 0ft.

Sample Point ID: SS19-04

Depth: 0ft.

Sample Point ID: SS19-03

Depth: 0ft.

Sample Point ID: SS19-02

Depth: 0ft.

Daily Site Visit Report

Sample Point ID: SS19-01

Depth: 0ft.

Sample Point ID: SS19-06

Depth: 0ft.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Jason Crabtree

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00672		CP	LE		4	4	07	18S	32E	612475	3624947*	1742	524	430	94
CP 00672 CLW475398	O	CP	LE		4	4	07	18S	32E	612475	3624947*	1742	540	460	80
CP 00814 POD1		CP	LE		2	2	08	18S	32E	614074	3626168*	3282	480		
CP 00566 POD1		CP	LE	4	4	1	04	18S	32E	614960	3627280*	4455	133	65	68

Average Depth to Water: **318 feet**

Minimum Depth: **65 feet**

Maximum Depth: **460 feet**

Record Count: 4

UTMNAD83 Radius Search (in meters):

Easting (X): 610846.9 **Northing (Y):** 3625566.6 **Radius:** 5000

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

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, C=the file is closed)

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

(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 6416	q 4	q 4	Sec	Tws	Rng	X	Y	Distance
CP 00636	CP	PRO	0	AMOCO PRODUCTION COMPANY	LE	CP 00636						4	4	07	18S	32E	612475	3624947*	1742
CP 00672	CP	STK	3	VIRGIL LINAM ESTATE	LE	CP 00672				Shallow		4	4	07	18S	32E	612475	3624947*	1742
CP 00896	CP	STK	3	B.L.M.	LE	CP 00896				Shallow	1	4	4	14	18S	31E	609166	3623398*	2743
CP 00814	CP	PLS	3	KENNETH SMITH	LE	CP 00814 POD1				Shallow		2	2	08	18S	32E	614074	3626168*	3282
CP 00566	CP	DOM	3	B.E. FRIZZELL	LE	CP 00566 POD1				Shallow	4	4	1	04	18S	32E	614960	3627280*	4455
CP 01447	CP	MON	0	PLAINS ALL AMERICAN PIPELINE	ED	CP 01447 POD1					4	3	1	25	18S	31E	609735	3620809	4884

Record Count: 6

UTMNAD83 Radius Search (in meters):

Easting (X): 610846.9 **Northing (Y):** 3625566.6 **Radius:** 5000

Sorted by: Distance

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

Help Using this Tool

Legend | Basemap | Query

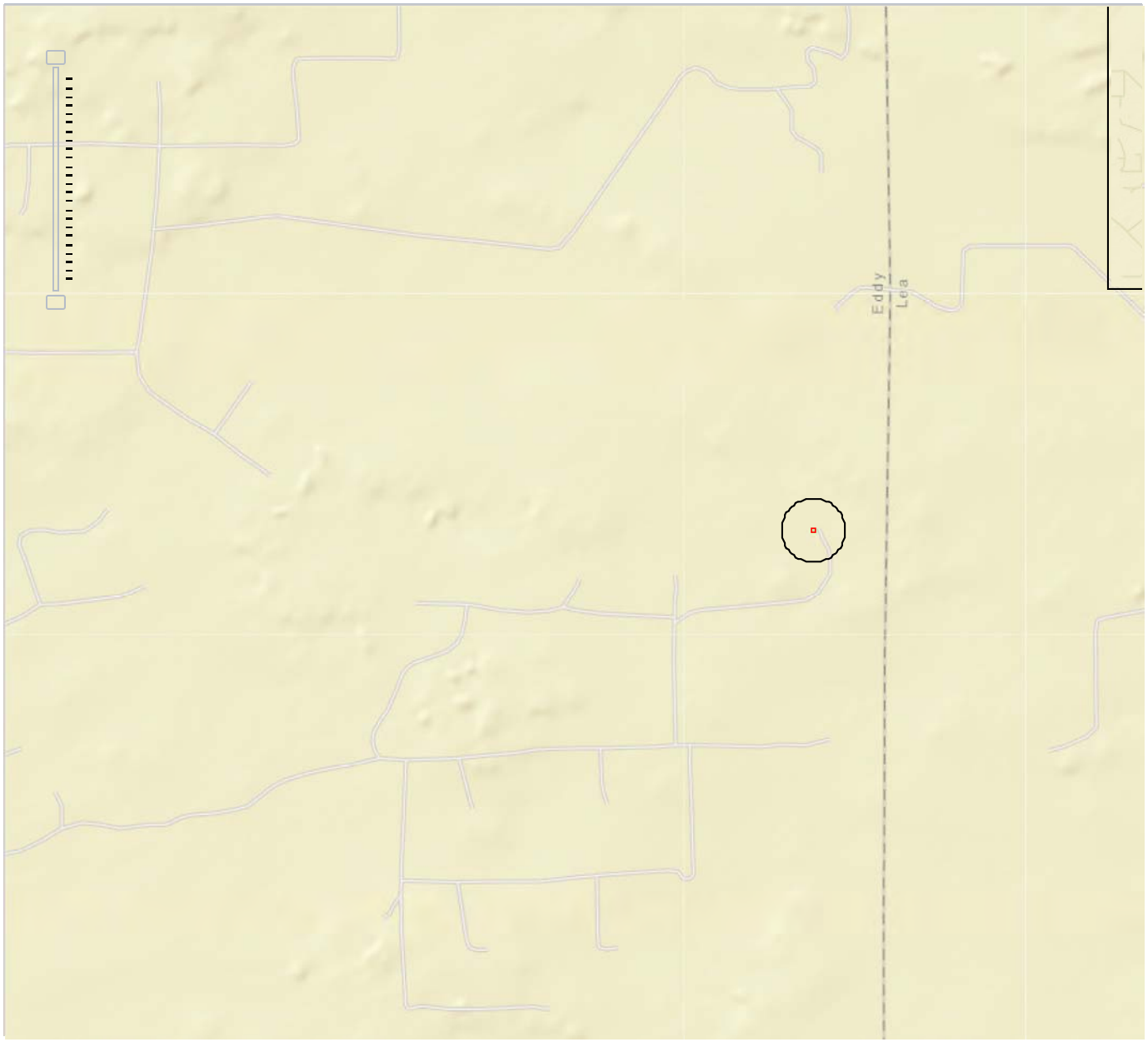
1:18,056

Legend

All Layers On/Off

All Layer Transparency

- Roads
- Counties
- Air Emissions
- Air Facilities
- APS Food Facilities
- Dairies
- Brownfields
- Ground Water Discharge Permits
- State Cleanup Program
- Voluntary Remediation Program
- Superfund Sites
- Drinking Water Sources
- Hazardous Waste Facilities
- Landfills
- Petroleum Storage Tanks
- Leaking Tank Sites
- NPDES Permits
- Water Quality Stations
- Nonpoint Source Program
- Impaired Waters
- Assessed Waters
- National Hydrography Dataset
- Watershed Boundary Dataset
- Aquifer Sensitivity
- National Land Cover Database
- USGS Stream Gages
- Legislative Boundaries
- Places
- Colonias



U.S. Fish and Wildlife Service
National Wetlands Inventory

Taylor Deep 12 Fed 9 Riverine 20,648 ft

March 31, 2019

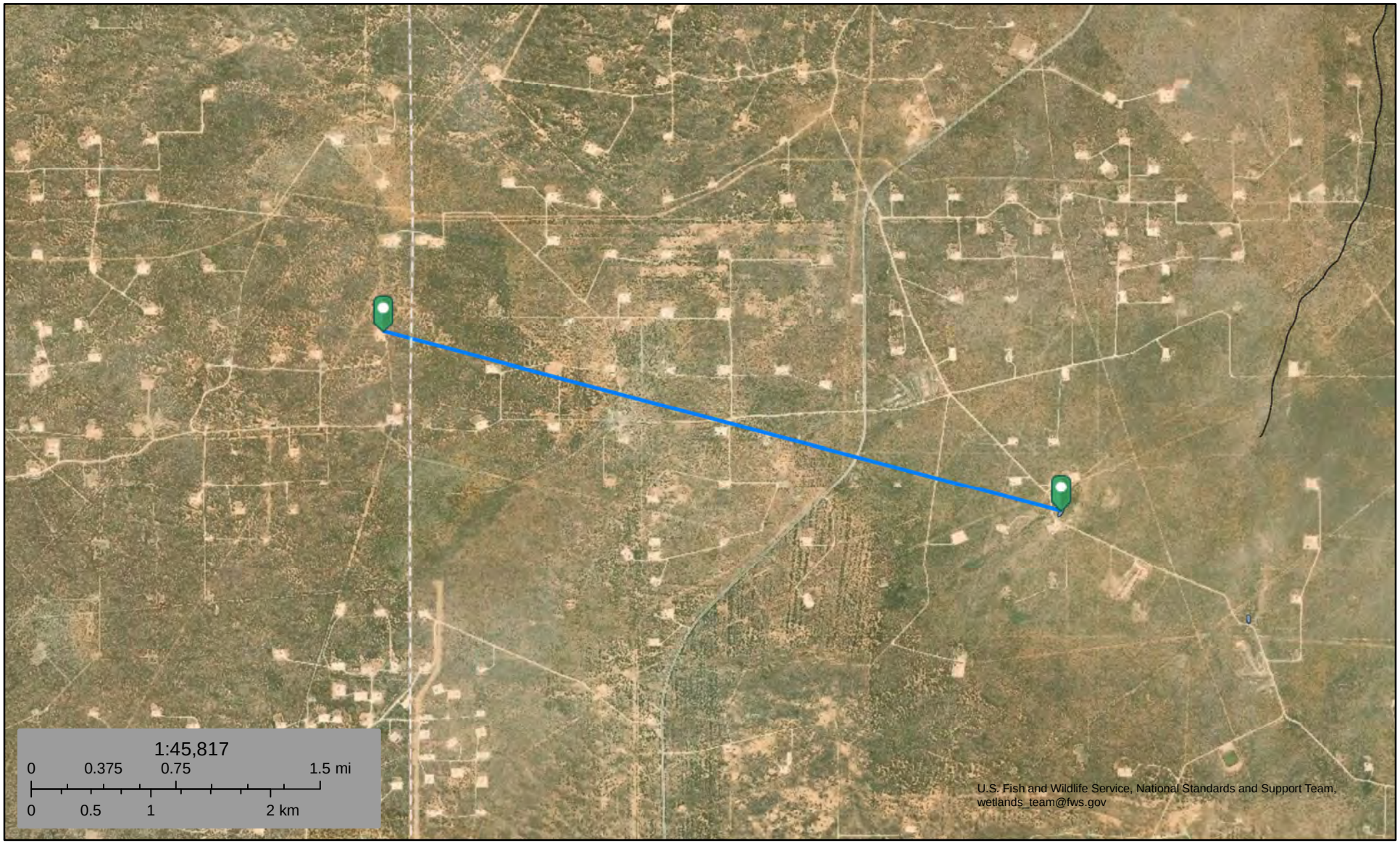
Wetlands

- 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

Taylor Deep 12 Fed 9 Lake 16,182 ft

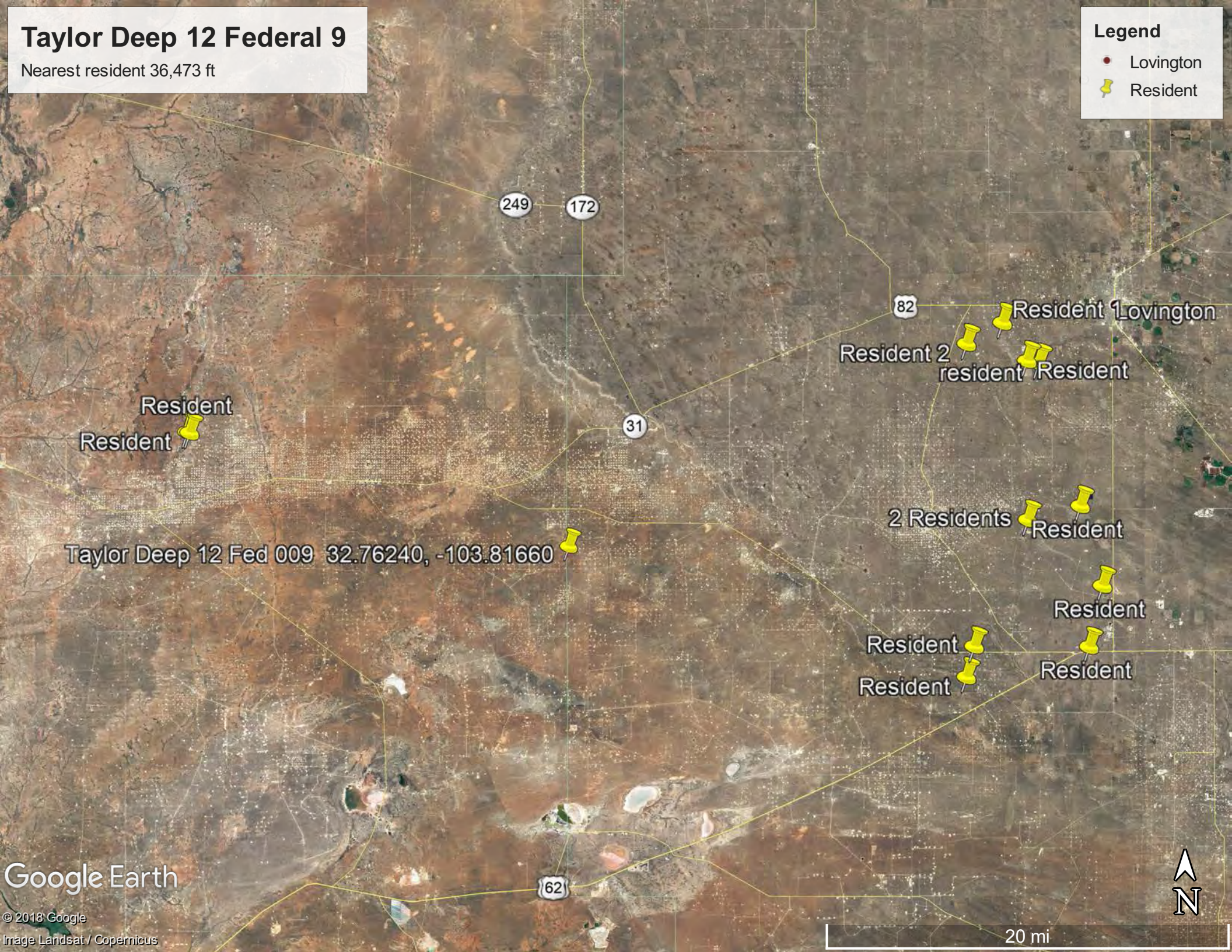


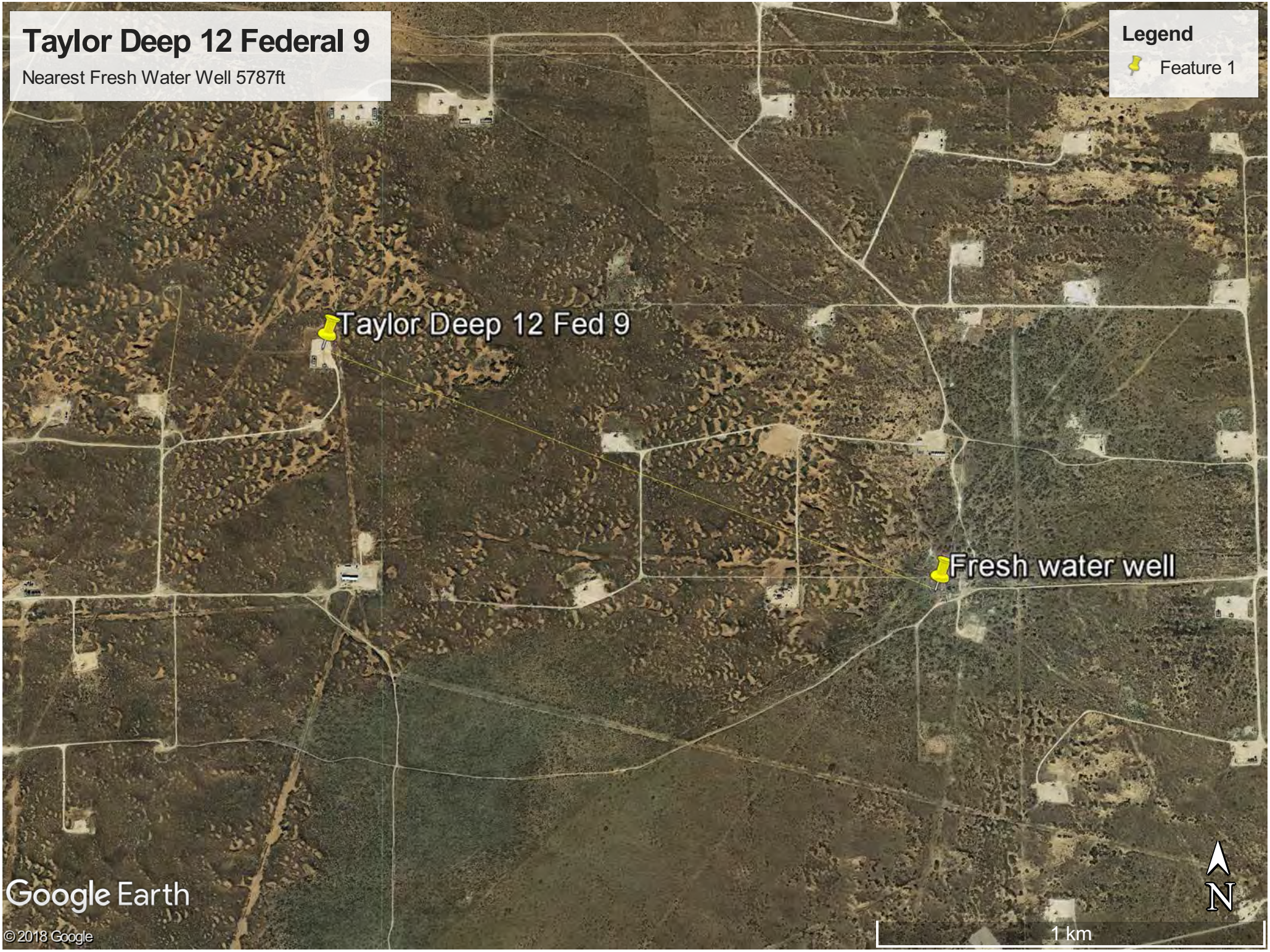
March 31, 2019

Wetlands

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

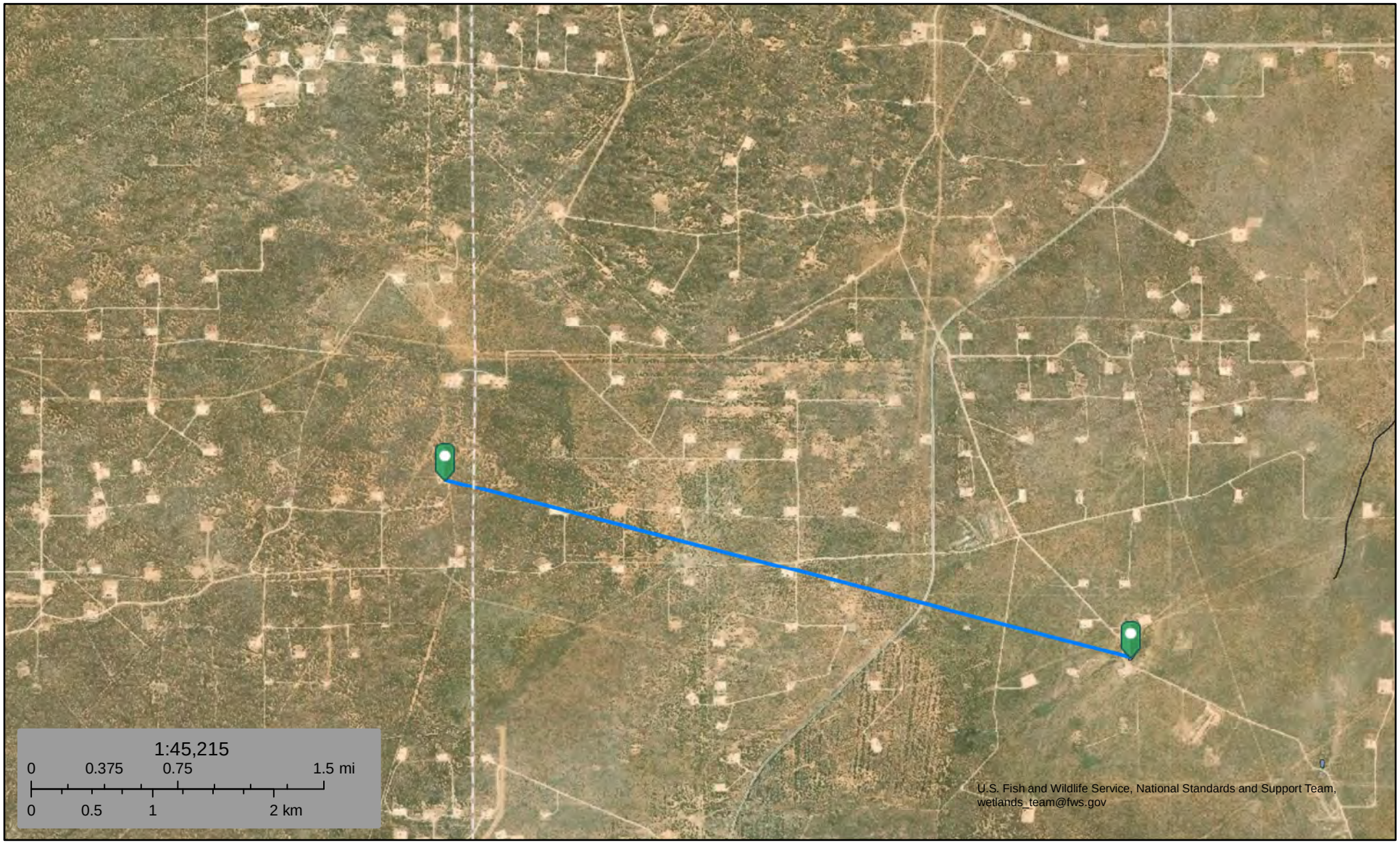
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.


Taylor Deep 12 Federal 9
Nearest resident 36,473 ft
Legend
Lovington
Resident
249
172
82
31
62
Resident
Lovington
Resident 2
resident
Resident
Resident
Resident
Taylor Deep 12 Fed 009 32.76240, -103.81660
2 Residents
Resident
Resident
Resident
Resident
Resident
Google Earth
© 2018 Google
Image Landsat / Copernicus
N
20 mi


Taylor Deep 12 Federal 9
Nearest Fresh Water Well 5787ft
Legend
Feature 1
Taylor Deep 12 Fed 9
Fresh water well
Google Earth
© 2018 Google
N
1 km

U.S. Fish and Wildlife Service
National Wetlands Inventory

Taylor Deep 12 Fed 9 Wetland 16,182 ft



March 31, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
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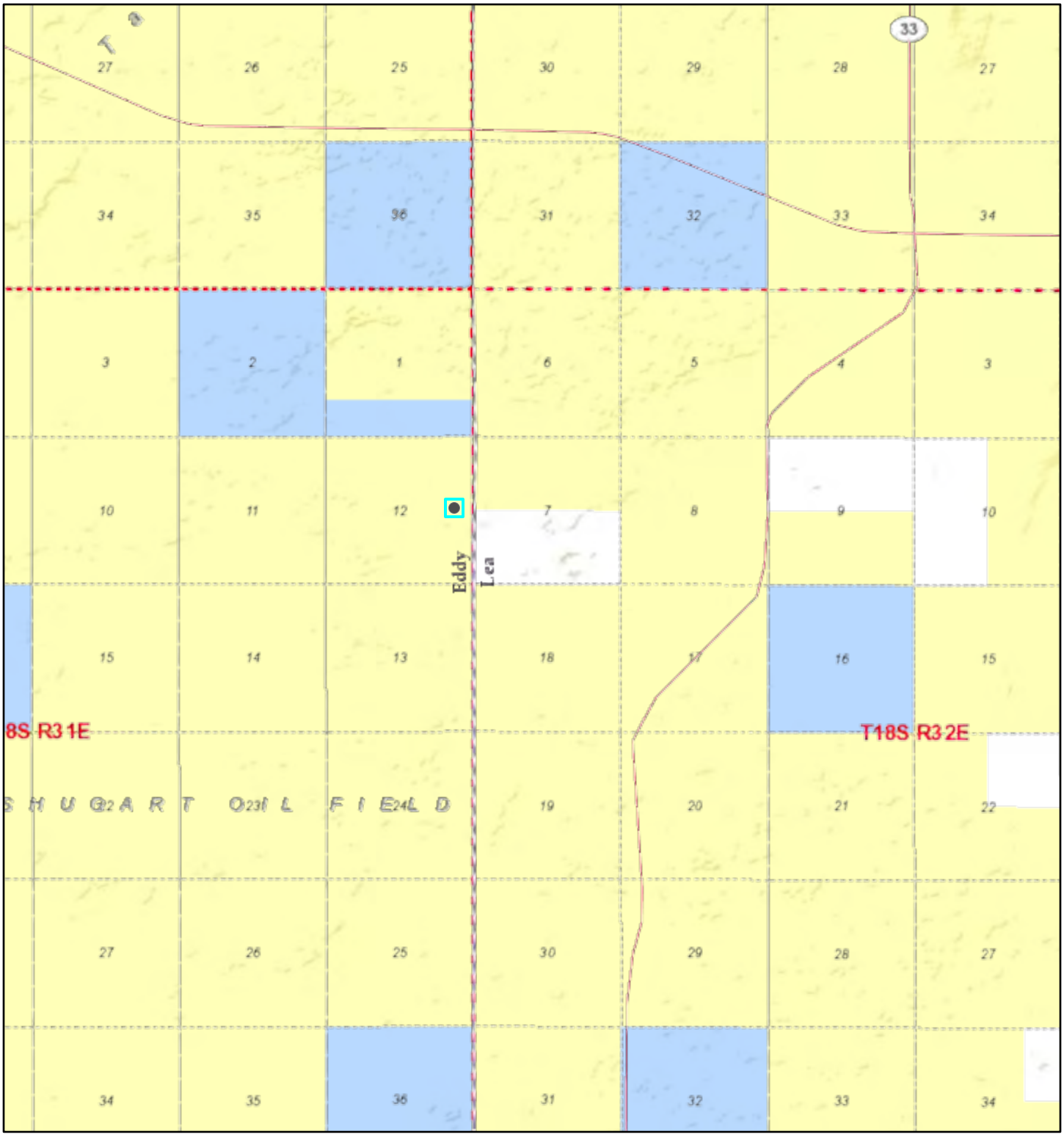
Active Mines in New Mexico



4/23/2019, 2:04:45 PM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

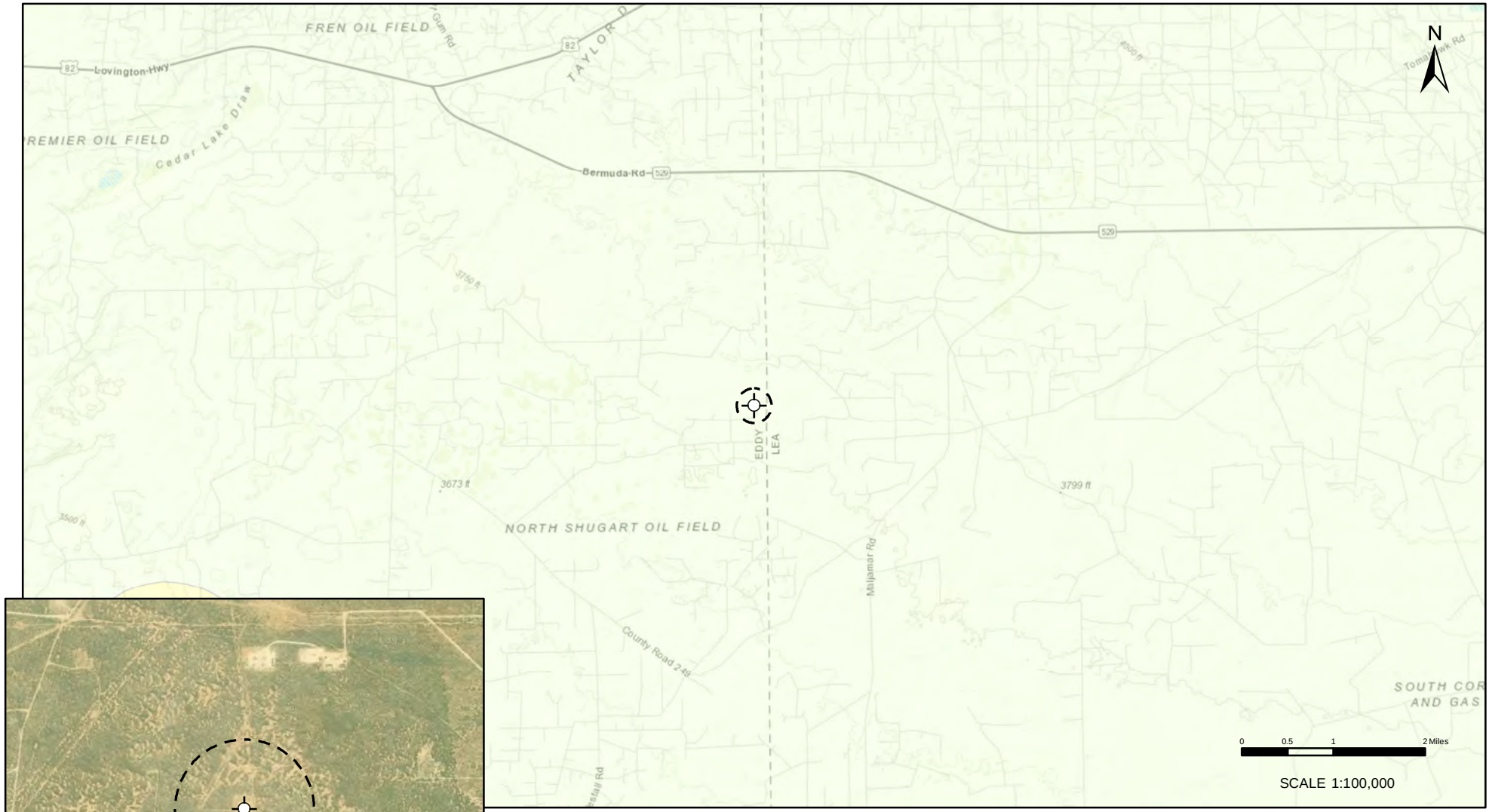
Registered Mines

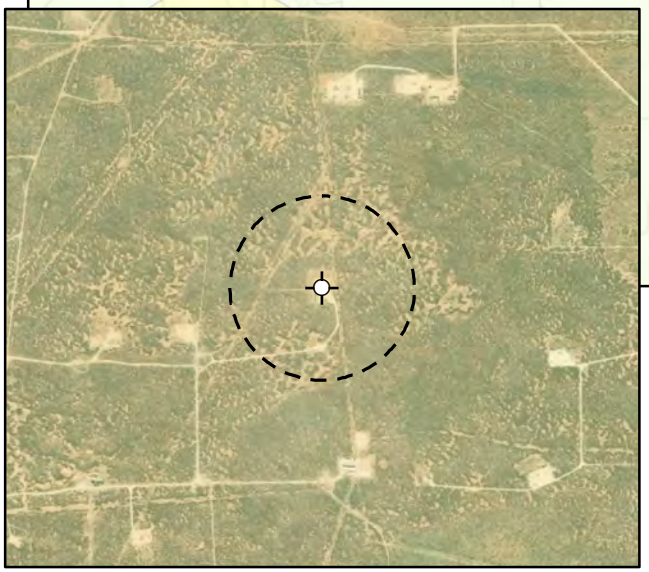
- Aggregate, Stone etc.

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

EMNRD MMD GIS Coordinator

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





LEGEND

KARST POTENTIAL

- CRITICAL
- HIGH
- MEDIUM
- LOW

Notes: Aerial Image from ESRI Digital Globe 2017

Marathon Oil

Karst Potential
Taylor Deep 12
Federal #009

VERTEX

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

FIGURE: **1**

VERSATILITY. EXPERTISE.

National Flood Hazard Layer FIRMette

FEMA

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 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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 4:05:36 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.

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

April 29, 2019

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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Contents

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

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 (Taylor Deep 12 fed 9)

Map Scale: 1:628 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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

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: Sep 18, 2016—Nov 20, 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 (Taylor Deep 12 fed 9)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KM	Kermit-Berino fine sands, 0 to 3 percent slopes	2.0	100.0%
Totals for Area of Interest		**2.0**	**100.0%**

Map Unit Descriptions (Taylor Deep 12 fed 9)

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.

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

KM—Kermit-Berino fine sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w4q
Elevation: 3,100 to 4,200 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Kermit and similar soils: 50 percent
Berino and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kermit

Setting

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

Typical profile

H1 - 0 to 7 inches: fine sand
H2 - 7 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Deep Sand (R042XC005NM)
Hydric soil rating: No

Description of Berino

Setting

Landform: Fan piedmonts, plains
Landform position (three-dimensional): Riser
Down-slope shape: Convex

Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 17 inches: fine sand
H2 - 17 to 50 inches: fine sandy loam
H3 - 50 to 58 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Minor Components

Active dune land

Percent of map unit:
Hydric soil rating: No

References

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ATTACHMENT 5

Invoice

Date	Invoice #
4/18/2019	109179

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

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			TAYLOR DEEP 12 FEDERAL 009

Service Date	Ticket #	Qty	Item	Description	Rate	Amount
				Hauled 1 load Caliche from BDS N 80 pit to location. Hauled 1 load material to R360 for disposal. Ticket # 700-1000136		
4/10/2019	91731	11	Belly Dump	Belly Dump	90.00	990.00T
		24	Caliche	Caliche	9.00	216.00T

Thank you for your business!

Phone # 575-689-8324

Sales Tax (5.9583%)	$71.86
Total	$1,277.86

BDS ENTERPRISES LLC
OILFIELD SERVICES

Mailing Address: 2510 Monte Vista Carlsbad, NM 88220
1705 E. Greene St., Carlsbad, NM 88220
bdsoilfield@gmail.com
Louie Barnes 575.499.9153
Brent Wilson 575.689.5134

TIME TICKET

№ 91731

OFFICE: 575.689.8324
FAX: 575.689.8325

CUSTOMER	MARATHON
WORK LOCATION (NAME)	Taylor Deep 12 Fed 9
CUSTOMER BILLING ADDRESS	JERRY CHAVEZ
ENTER LOCATION WHERE WORK WAS DONE	
CITY	
COUNTY	EDDY
STATE	NM
TAX CODE	
TAX RATE	
DATE	04 / 10 / 19
CUSTOMER P.O. NUMBER	
CUSTOMER NUMBER	
SESI JOB NO.	

FROM	TO	HOURS	DESCRIPTION
		11	HAULED CALICHE TO TAYLOR DEEP 12 FEDERAL 9. THEN CONTAMINATED SAIL TO R360

NAME	TITLE	HRS	RATE	AMOUNT	EQUIPMENT	UNIT NO.	HOURS	RATE	AMOUNT
CESAR FONTES		11			BOBCAT Loader	38	1	90	
Orlando Morales									

TOTAL	
NON-TAXABLE	
TAXABLE	
% SALES TAX	
TOTAL AMOUNT INCLUDING TAX	

MATERIALS / SUBCONTRACTOR / SUBSISTENCE	AMOUNT
1 LOAD CALICHE 80	
24 yds Caliche @ 9.00	
TOTAL	

CUSTOMER SIGNATURE

CONTRACTOR SIGNATURE

NICHOLS PRINTING, INC. • 575.885.3313

R360 ENVIRONMENTAL SOLUTIONS

Permian Basin

Customer:	MARATHON OIL COMPANY
Customer #:	CRI3930
Ordered by:	CALLIE KARRIGAN
AFE #:	
PO #:	
Manifest #:	381595
Manif. Date:	4/10/2019
Hauler:	BDS TRUCKING
Driver	CESAR
Truck #	38
Card #	
Job Ref #	

Ticket #:	700-1000136
Bid #:	O6UJ9A000AM5
Date:	4/10/2019
Generator:	MARATHON OIL COMPANY
Generator #:	
Well Ser. #:	39764E
Well Name:	TAYLOR DEEP 12 FEDERAL
Well #:	009
Field:	
Field #:	
Rig:	NON-DRILLING
County	EDDY (NM)

Facility: CRI

Product / Service	Quantity Units
Contaminated Soil (RCRA Exempt)	15.00 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:

X RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt wast

__ 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: _____

R360 ENVIRONMENTAL SOLUTIONS

NEW MEXICO NON-HAZARDOUS OILFIELD WASTE MANIFEST

(PLEASE PRINT)

Callie Karrigan
Company Man Contact Information
Name [illegible]
Phone No. 575-361-1137

NO. 381593

GENERATOR

Operator No.
Operators Name: Marathon Oil Company
Address: 4111 S Tidwell Road
City, State, Zip: Carlsbad, NM 88220
Phone No.: 405-702-1028

Permit/RRC No. / Lease/Well: 29523800
Name & No.: Taylor Deep 12 Fed 9
County:
API No.: 30-015-39764
Rig Name & No.:
AFE/PO No.: non-drilling

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

		NON-INJECTABLE WATERS		INJECTABLE WATERS	
Oil Based Muds		Washout Water (Non-Injectable)		Washout Water (Injectable)	
Oil Based Cuttings		Completion Fluid/Flow back (Non-Injectable)		Completion Fluid/Flow back (Injectable)	
Water Based Muds		Produced Water (Non-Injectable)		Produced Water (Injectable)	
Water Based Cuttings		Gathering Line Water/Waste (Non-Injectable)		Gathering Line Water/Waste (Injectable)	
Produced Formation Solids		INTERNAL USE ONLY		OTHER EXEMPT WASTES (type and generation process of the waste)	
Tank Bottoms		Truck Washout (exempt waste)			
E&P Contaminated Soil	15				
Gas Plant Waste					

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

NON-EXEMPT E&P Waste/Service Identification and Amount

All non-exempt E&P waste must be analyzed and be below the three solid limits for toxicity, TCLP, ignitability, corrosivity and reactivity

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

QUANTITY: 15 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-OILFEILD: Emergency non-hazardous, non-oilfeild waste that has been ordered by the Department of Public Safety (the order, documentation of non-hazardous waste determination and a desciption of the waste must accompany this form)

Callie Karrigan per Jason Crabtree — (PRINT) AUTHORIZED AGENTS NAME
4-10-2019 — DATE
[signature] — SIGNATURE

TRANSPORTER

Transporter's Name: BOS
Address:
Phone No.:
Driver's Name: CESAR
Print Name:
Phone No.: 3138
Truck No.:

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.

4-10-19 — SHIPMENT DATE
[signature] — DRIVER'S SIGNATURE
4-10-19 — DELIVERY DATE
[signature] — DRIVER'S SIGNATURE

DISPOSAL FACILITY

TRUCK TIME STAMP
IN: OUT:

RECEIVING AREA
Name/No. 5005

Site Name/ Permit No.: Halfway Facility / NM1-006
Address: 6601 Hobbs Hwy US 62/180 Mile Marker 66 Carlsbad, NM 88220
Phone No.: 575-393-1079

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		BS&W (%)
Free Water		
Total Received		

I hereby certify that the above load material has been (circle one): ACCEPTED DENIED If denied, why?

[signature] — NAME (PRINT)
4/10 — DATE
[illegible] — TITLE
[signature] — SIGNATURE

C-138 White - R360 ORIGINAL Yellow - TRANSPORTER COPY Pink - GENERATOR SITE COPY Gold - RETURN TO GENERATOR Version 1

ATTACHMENT 6

Table 3. Soil Characterization - Salinity and Petroleum Hydrocarbon Parameters
Client Name: Marathon Oil LLC
Site Name: Taylor Deep 12 Federal #009
Project #: 19E-00614
Lab Report(s): April 19, 2019

Table 3. Soil Analysis - April 10 , 2019																			
Sample Description			Field Screening			Petroleum Hydrocarbons													Inorganic
						Volatile							Extractable						
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Quantab Result (High/Low)	Benzene	Toluene	Ethylbenzene	Xylenes (m&p)	Xylenes (o)	Xylenes (Total)	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Hydrocarbons	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(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)	(mg/kg)
SS 19-01	0	4/10/2019	10	7	High 295	< 0.00200	< 0.00200	< 0.00200	< 0.00401	< 0.00200	< 0.00200	< 0.00200	< 15.0	< 15.0	< 15.0	30	< 15.0	404
SS 19-02	0	4/10/2019	14	9	High ND	< 0.00199	< 0.00199	< 0.00199	< 0.00398	< 0.00199	< 0.00199	< 0.00199	< 15.0	< 15.0	< 15.0	30	< 15.0	70.5
SS 19-03	0	4/10/2019	33	247	High 904	< 0.00201	< 0.00201	< 0.00201	< 0.00402	< 0.00201	< 0.00201	< 0.00201	< 14.9	< 14.9	< 14.9	29.8	< 14.9	97.9
SS 19-04	0	4/10/2019	0	621	High 828	< 0.00200	< 0.00200	< 0.00200	< 0.00399	< 0.00200	< 0.00200	< 0.00200	< 15.0	854	242	869	1100	2,900
SS 19-05	0	4/10/2019	2	14	High ND	< 0.00200	< 0.00200	< 0.00200	< 0.00399	< 0.00200	< 0.00200	< 0.00200	< 15.0	24.2	< 15.0	39.2	24.2	587
SS 19-06	0	4/10/2019	N/A	N/A	N/A	< 0.00200	< 0.00200	< 0.00200	< 0.00400	< 0.00200	< 0.00200	< 0.00200	19	< 15.0	< 15.0	34	19	462

Bold and Shaded indicates exceedance outside of applied action level.

VERTEX

ATTACHMENT 7

From:	Dhugal Hanton
To:	Robyn Fisher
Subject:	FW: Marathon Oil - Taylor Deep 12 Federal #009 - Final Confirmatory Sample Notification - RP Not Yet Assigned
Date:	April-23-19 2:17:19 PM

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

From: Dhugal Hanton
Sent: April 5, 2019 10:46 AM
To: Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>; Venegas, Victoria, EMNRD (Victoria.Venegas@state.nm.us) <Victoria.Venegas@state.nm.us>; James Amos <jamos@blm.gov>
Cc: Callie Karrigan - Marathon Oil Permain LLC (cnkarrigan@marathonoil.com) <cnkarrigan@marathonoil.com>; Isaac Castro <icastro@marathonoil.com>; Dennis Williams <DWilliams@vertex.ca>
Subject: Marathon Oil - Taylor Deep 12 Federal #009 - Final Confirmatory Sample Notification - RP Not Yet Assigned

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 3:00 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 620947

Marathon Oil Company, Tulsa, OK

Project Name: Taylor Deep 12 Federal #009

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

Date Received in Lab: Fri Apr-12-19 10:52 am
Report Date: 19-APR-19
Project Manager: Kalei Stout

Analysis Requested													
	Lab Id:	620947-001		620947-002		620947-003		620947-004		620947-005		620947-006	
	Field Id:	SS19-01		SS19-02		SS19-03		SS19-04		SS19-05		SS19-06	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-10-19 09:35		Apr-10-19 09:40		Apr-10-19 09:45		Apr-10-19 09:50		Apr-10-19 09:55		Apr-10-19 10:00	
BTEX by EPA 8021B	***Extracted:***	Apr-17-19 13:00		Apr-17-19 13:00		Apr-17-19 13:00		Apr-17-19 13:00		Apr-17-19 13:00		Apr-17-19 13:00	
	Analyzed:	Apr-17-19 22:14		Apr-17-19 22:33		Apr-17-19 22:52		Apr-17-19 23:11		Apr-17-19 23:30		Apr-17-19 23:49	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Toluene		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Ethylbenzene		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
m,p-Xylenes		<0.00401	0.00401	<0.00398	0.00398	<0.00402	0.00402	<0.00399	0.00399	<0.00399	0.00399	<0.00400	0.00400
o-Xylene		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Total Xylenes		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Total BTEX		<0.00200	0.00200	<0.00199	0.00199	<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Inorganic Anions by EPA 300	***Extracted:***	Apr-18-19 17:00		Apr-18-19 17:00		Apr-18-19 17:00		Apr-18-19 17:00		Apr-18-19 17:00		Apr-18-19 17:00	
	Analyzed:	Apr-19-19 08:45		Apr-19-19 08:51		Apr-19-19 08:58		Apr-19-19 14:16		Apr-19-19 10:00		Apr-19-19 10:06	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		404	5.00	70.5	4.95	97.9	5.00	2900	50.1	587	5.01	462	5.01
TPH by SW8015 Mod	***Extracted:***	Apr-15-19 16:00		Apr-15-19 16:00		Apr-15-19 16:00		Apr-15-19 16:00		Apr-15-19 16:00		Apr-15-19 16:00	
	Analyzed:	Apr-15-19 21:34		Apr-15-19 22:31		Apr-15-19 22:51		Apr-15-19 23:10		Apr-15-19 23:29		Apr-15-19 23:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0	19.0	15.0
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0	<14.9	14.9	854	15.0	24.2	15.0	<15.0	15.0
Motor Oil Range Hydrocarbons (MRO)		<15.0	15.0	<15.0	15.0	<14.9	14.9	242	15.0	<15.0	15.0	<15.0	15.0
Total TPH		<15.0	15.0	<15.0	15.0	<14.9	14.9	1100	15.0	24.2	15.0	19.0	15.0

Kalei Stout
Midland Laboratory Director

Analytical Report 620947

for

Marathon Oil Company

Project Manager: Callie Karrigan

Taylor Deep 12 Federal #009

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): **620947**
Taylor Deep 12 Federal #009
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) 620947. 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. 620947 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

Sample Cross Reference 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SS19-01	S	04-10-19 09:35		620947-001
SS19-02	S	04-10-19 09:40		620947-002
SS19-03	S	04-10-19 09:45		620947-003
SS19-04	S	04-10-19 09:50		620947-004
SS19-05	S	04-10-19 09:55		620947-005
SS19-06	S	04-10-19 10:00		620947-006

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 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-01**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-001	Date Collected:	04.10.19 09.35		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**404**	5.00	mg/kg	04.19.19 08.45		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.15.19 21.34	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.15.19 21.34	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.15.19 21.34	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.15.19 21.34	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	101	%	70-135	04.15.19 21.34	
o-Terphenyl	84-15-1	94	%	70-135	04.15.19 21.34	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-01**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-001	Date Collected:	04.10.19 09.35		
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	<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	04.17.19 22.14	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.17.19 22.14	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	100	%	70-130	04.17.19 22.14	
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.17.19 22.14	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-02**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-002	Date Collected:	04.10.19 09.40		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**70.5**	4.95	mg/kg	04.19.19 08.51		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.15.19 22.31	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.15.19 22.31	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.15.19 22.31	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.15.19 22.31	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	101	%	70-135	04.15.19 22.31	
o-Terphenyl	84-15-1	93	%	70-135	04.15.19 22.31	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-02**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-002	Date Collected:	04.10.19 09.40		
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	04.17.19 22.33	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	04.17.19 22.33	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	04.17.19 22.33	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	04.17.19 22.33	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	04.17.19 22.33	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	04.17.19 22.33	U	1
Total BTEX		<0.00199	0.00199	mg/kg	04.17.19 22.33	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	97	%	70-130	04.17.19 22.33	
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.17.19 22.33	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-03**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-003	Date Collected:	04.10.19 09.45		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**97.9**	5.00	mg/kg	04.19.19 08.58		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.15.19 22.51	U	1
Diesel Range Organics (DRO)	C10C28DRO	<14.9	14.9	mg/kg	04.15.19 22.51	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<14.9	14.9	mg/kg	04.15.19 22.51	U	1
Total TPH	PHC635	<14.9	14.9	mg/kg	04.15.19 22.51	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	106	%	70-135	04.15.19 22.51	
o-Terphenyl	84-15-1	101	%	70-135	04.15.19 22.51	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-03**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-003	Date Collected:	04.10.19 09.45		
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	04.17.19 22.52	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	04.17.19 22.52	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	04.17.19 22.52	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	04.17.19 22.52	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	04.17.19 22.52	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	04.17.19 22.52	U	1
Total BTEX		<0.00201	0.00201	mg/kg	04.17.19 22.52	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	101	%	70-130	04.17.19 22.52	
1,4-Difluorobenzene	540-36-3	102	%	70-130	04.17.19 22.52	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-04**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-004	Date Collected:	04.10.19 09.50		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2900**	50.1	mg/kg	04.19.19 14.16		10

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.15.19 23.10	U	1
Diesel Range Organics (DRO)	C10C28DRO	**854**	15.0	mg/kg	04.15.19 23.10		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**242**	15.0	mg/kg	04.15.19 23.10		1
Total TPH	PHC635	**1100**	15.0	mg/kg	04.15.19 23.10		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	107	%	70-135	04.15.19 23.10	
o-Terphenyl	84-15-1	109	%	70-135	04.15.19 23.10	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-04**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-004	Date Collected:	04.10.19 09.50		
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	<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	04.17.19 23.11	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.17.19 23.11	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	102	%	70-130	04.17.19 23.11	
4-Bromofluorobenzene	460-00-4	97	%	70-130	04.17.19 23.11	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-05**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-005	Date Collected:	04.10.19 09.55		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**587**	5.01	mg/kg	04.19.19 10.00		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.15.19 23.29	U	1
Diesel Range Organics (DRO)	C10C28DRO	**24.2**	15.0	mg/kg	04.15.19 23.29		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.15.19 23.29	U	1
Total TPH	PHC635	**24.2**	15.0	mg/kg	04.15.19 23.29		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	107	%	70-135	04.15.19 23.29	
o-Terphenyl	84-15-1	105	%	70-135	04.15.19 23.29	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-05**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-005	Date Collected:	04.10.19 09.55		
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	<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	04.17.19 23.30	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.17.19 23.30	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	99	%	70-130	04.17.19 23.30	
1,4-Difluorobenzene	540-36-3	101	%	70-130	04.17.19 23.30	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-06**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-006	Date Collected:	04.10.19 10.00		

Analytical Method:	Inorganic Anions by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.18.19 17.00	Basis:	Wet Weight
Seq Number:	3086271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**462**	5.01	mg/kg	04.19.19 10.06		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.15.19 16.00	Basis:	Wet Weight
Seq Number:	3085760				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	**19.0**	15.0	mg/kg	04.15.19 23.48		1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.15.19 23.48	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.15.19 23.48	U	1
Total TPH	PHC635	**19.0**	15.0	mg/kg	04.15.19 23.48		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	95	%	70-135	04.15.19 23.48	
o-Terphenyl	84-15-1	88	%	70-135	04.15.19 23.48	

Certificate of Analytical Results 620947

Marathon Oil Company, Tulsa, OK

Taylor Deep 12 Federal #009

Sample Id:	**SS19-06**	Matrix:	Soil	Date Received:	04.12.19 10.52
Lab Sample Id:	620947-006	Date Collected:	04.10.19 10.00		
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	<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	04.17.19 23.49	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.17.19 23.49	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	87	%	70-130	04.17.19 23.49	
4-Bromofluorobenzene	460-00-4	81	%	70-130	04.17.19 23.49	

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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

QC Summary 620947

Marathon Oil Company

Taylor Deep 12 Federal #009

Analytical Method: **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086271 Matrix: Solid Date Prep: 04.18.19
MB Sample Id: 7676095-1-BLK LCS Sample Id: 7676095-1-BKS 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** Prep Method: E300P
Seq Number: 3086271 Matrix: Soil Date Prep: 04.18.19
Parent Sample Id: 620911-011 MS Sample Id: 620911-011 S 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	

Analytical Method: **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086271 Matrix: Soil Date Prep: 04.18.19
Parent Sample Id: 620983-003 MS Sample Id: 620983-003 S 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** Prep Method: TX1005P
Seq Number: 3085760 Matrix: Solid Date Prep: 04.15.19
MB Sample Id: 7675794-1-BLK LCS Sample Id: 7675794-1-BKS LCSD Sample Id: 7675794-1-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	1010	101	981	98	70-135	3	20	mg/kg	04.15.19 20:55	
Diesel Range Organics (DRO)	<8.13	1000	1080	108	1040	104	70-135	4	20	mg/kg	04.15.19 20:55	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	115		129		128		70-135	%	04.15.19 20:55
o-Terphenyl	116		129		128		70-135	%	04.15.19 20:55

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

QC Summary 620947

Marathon Oil Company

Taylor Deep 12 Federal #009

Analytical Method: **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3085760 Matrix: Soil Date Prep: 04.15.19
Parent Sample Id: 620947-001 MS Sample Id: 620947-001 S MSD Sample Id: 620947-001 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)	14.9	1000	951	94	948	93	70-135	0	20	mg/kg	04.15.19 21:53	
Diesel Range Organics (DRO)	14.5	1000	1060	105	1060	105	70-135	0	20	mg/kg	04.15.19 21:53	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	123		122		70-135	%	04.15.19 21:53
o-Terphenyl	111		110		70-135	%	04.15.19 21:53

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3086143 Matrix: Solid Date Prep: 04.17.19
MB Sample Id: 7676058-1-BLK LCS Sample Id: 7676058-1-BKS 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** Prep Method: SW5030B
Seq Number: 3086143 Matrix: Soil Date Prep: 04.17.19
Parent Sample Id: 621042-001 MS Sample Id: 621042-001 S 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 [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

Analysis Request of Chain of Custody Record

1620947

Client Name: Marathon Oil Company	**Site Manager:** Callie Karrigan
Project Name: Taylor Deep 12 Federal #009	
Project Location: (county, state) Eddy County, New Mexico	**Project #:** 19E-00614
Invoice to: Callie Karrigan (cnkarrigan@marathonoil.com)	
Receiving Laboratory: Xenco	**Sampler Signature:**

Comments:

Send results to (cnkarrigan@marathonoil.com, permian@vertex.ca, icastro@marathonoil.com)

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	SAMPLING TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX:	PRESERVATIVE METHOD: HCL	PRESERVATIVE METHOD: HNO_3	PRESERVATIVE METHOD: ICE	PRESERVATIVE METHOD:	PRESERVATIVE METHOD:	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloridem (method 300)	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance					Hold
	SS19-01	April 10 2019	9:35		X				X			1	N	X		X												X							
	SS19-02	April 10 2019	9:40		X				X			1	N	X		X												X							
	SS19-03	April 10 2019	9:45		X				X			1	N	X		X												X							
	SS19-04	April 10 2019	9:50		X				X			1	N	X		X												X							
	SS19-05	April 10 2019	9:55		X				X			1	N	X		X												X							
	SS19-06	April 10 2019	10:00		X				X			1	N	X		X												X							

Relinquished by: Jason Crabtree	Date: April 10, 2019	Time: 3:30pm	Received by: Dennis Williams
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

Date: April 10, 2019 Time: 3:30 PM

Date: 4/12/19 Time: 1052

Date: Time:

LAB USE ONLY

Sample Temperature

0.5/04

-0.1 R8

REMARKS:

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY

7749512 84060

Final 1.000

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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/INET4100
DIMS: 19x14x17 IN
BILL RECIPIENT

TO HOLD FOR XENCO
FEDEX EXPRESS SHIP CENTER
FEDEX SHIP CENTER
3600 COUNTY RD 1276 S
MIDLAND TX 79711
(806) 794-1296
INV:
PO:
REF:
DEPT:

565J1/D7E5/23AD

J1910190167101/7

FedEx Express

FRI - 12 APR HOLD
STANDARD OVERNIGHT
HLD
MAFA
TX-US LBB

TRK# 0201 7749 5128 4060

41 MAFA

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 10:52:00 AM

Work Order #: 620947

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 Date: 04/12/2019

Brianna Teel

Checklist reviewed by: Kalei Stout Date: 04/12/2019

Kalei Stout