Raybaw Operating, LLC.
2626 Cole Ave., Suite 300
Dallas, TX 75204
214-800-2301

May 17, 2023

RE: Site Assessment, Remediation, and Closure Report
McKay West Federal #001
API No. 30-025-24931
GPS: Latitude 32.7057343 Longitude -103.7562866
UL "F", Section 34, Township 18S, Range 32E,
Lea County, NM
NMOCD Reference No. nOY1720255014

Raybaw Operating, LLC (Raybaw) has contracted Pima Environmental Services, LLC (Pima) to perform a site assessment, remediation, and prepare this closure report for a crude oil release that happened at the McKay West Federal #001 (McKay). An initial C-141 was submitted on July 18, 2017, and can be found in Appendix C. This incident was assigned Incident ID NOY1720255014, by the New Mexico Oil Conservation Division (NMOCD).

Site Information and Site Characterization

The McKay is located approximately ten (10) miles south of Maljamar, NM. This spill site is in Unit F, Section 34, Township 18S, Range 32E, Latitude 32.7057343 Longitude -103.7562866, Lea County, NM. A Location Map can be found in Figure 1.

Per the New Mexico Bureau of Geology and Mineral Resources, the geology is Eolian and piedmont deposits. Interlayered eolian sands and piedmont-slope deposits along the eastern flank of the Pecos River valley, primarily between Roswell and Carlsbad. Typically capped by thin eolian deposits. The soil in this area is made up of Kermit-Palomas fine sands, 0 to 12 percent slopes according to the United States Department of Agriculture Natural Resources Conservation Service soil survey (Appendix B). The drainage courses in this area are excessively drained. There is a low potential for karst geology to be present around the McKay (Figure 3).

According to the New Mexico Office of the State Engineer, depth to the nearest groundwater in this area is greater than 51 feet below grade surface (BGS). According to the United States Geological Survey well water data, depth to the nearest groundwater in this area is 117 feet BGS. See Appendix A for referenced water surveys.

Table 1 NMAC and Closure Criteria 19.15.29					
Depth to Groundwater (Appendix A)	Constituent & Limits				
	Chlorides	Total TPH	GRO+DRO	BTEX	Benzene
<50' (Lack of GW data)	600 mg/kg	100 mg/kg		50 mg/kg	10 mg/kg
51-100'	10,000 mg/kg	2,500 mg/kg	1,000 mg/kg	50 mg/kg	10 mg/kg
>100'	20,000 mg/kg	2,500 mg/kg	1,000 mg/kg	50 mg/kg	10 mg/kg

Reference Figure 2 for a Topographic Map.

Release Information

nOY1720255014: On July 2, 2017, there was a stuffing box packing failure. Well was shut in. Equipment repaired and impacted soils cleaned up. Approximately 6 barrels (bbls) of crude oil were released onto the pad and approximately 6 bbls were recovered via vacuum truck.

Site Assessment & Remediation Activities

On September 25, 2018, Tetra Tech Inc. performed an initial site assessment for Marathon Oil Company who was the operator at that time.

On October 15, 2018, Tetra Tech Inc. began excavation activities at the site. Approximately 300 cubic yards of contaminated soil were removed and hauled to an approved, lined disposal facility. A closure report was drafted and submitted to the NMOCD.

On March 31, 2023, the submitted closure report was denied by the NMOCD citing:

Closure of this incident is not approved. When nearby wells are used to determine depth to groundwater, the wells should be no further than ½ mile away from the site, and data should be no more than 25 years old, and well construction information should be provided. If evidence of depth to ground water within a ½ mile radius of the site cannot be provided, impacted soils will need to meet Table 1 Closure Criteria for ground water at a depth of 50 feet or less. In order to satisfy the Restoration, reclamation, and re-vegetation to 19.15.29.13 NMAC All floor samples 0-4' need to be below closure criteria standards of <50' depth to groundwater from Table 1 of the spill rule. Only sample points on pad that require a major facility deconstruction will be deferred. If you believe a certain area will require a deferral, please make sure that it has been fully delineated and specify the exact soil sample locations.

The rejected closure report can be found in Appendix F.

On April 11, 2023, Pima personnel mobilized personnel and equipment to the site to assess the previously excavated area for additional contamination. We collected samples from the areas surrounding sample points BH7, BH13, BH17, T1, and T2 from depths of 3' and 4' bgs to determine if the top 4' of soil was contaminated. The results of this sampling event can be found in the following data table. A Site Map can be found in Figure 4. Photographic Documentation can be found in Appendix D.

4/11/2023 Soil Sample Results

NMOCD Table 1 Closure Criteria 19.15.29 NMAC (Depth to Groundwater is <50')								
Raybaw Operating - MCKAY WEST FED #1								
Date: 4/11/2023		NM Approved Laboratory Results						
Sample ID	Depth (BGS)	BTEX mg/kg	Benzene mg/kg	GRO mg/kg	DRO mg/kg	MRO mg/kg	Total TPH mg/kg	Cl mg/kg
BH7	3'	ND	ND	ND	ND	ND	0	83.9
	4'	ND	ND	ND	ND	ND	0	84.5
BH 13	3'	ND	ND	ND	ND	ND	0	94.4
	4'	ND	ND	ND	ND	ND	0	71.4
BH 17	3'	ND	ND	ND	ND	ND	0	85.1
	4'	ND	ND	ND	ND	ND	0	90.6
T1	3'	ND	ND	ND	ND	ND	0	90.8
	4'	ND	ND	ND	ND	ND	0	82.2
T2	3'	ND	ND	ND	ND	ND	0	ND
	4'	ND	ND	ND	ND	ND	0	97

ND – Non Detect

Complete laboratory reports can be found in Appendix E.

Closure Request

After careful review, the collected samples are below the closure criteria according to Table 1 of NMAC 19.15.29. On behalf of Raybaw, Pima requests that this incident, NOY1720255014 be closed. Raybaw has complied with the applicable closure requirements.

Should you have any questions or need additional information, please feel free to contact:
Raybaw Operating – Nancy Winn at 281-793-5452 or nwinn@sbcglobal.net.
Pima Environmental – Tom Bynum at 580-748-1613 or tom@pimaoil.com.

Attachments

Figures:

1- Location Map
2- Topographic Map
3- Karst Map
4- Site Map

Appendices:

Appendix A – Referenced Water Surveys
Appendix B – Soil Survey and Geological Data
Appendix C – C-141 Form
Appendix D – Photographic Documentation
Appendix E – Laboratory Reports
Appendix F – NMOCD-rejected Closure Report

Pima Environmental Services

Figures:

1-Location Map

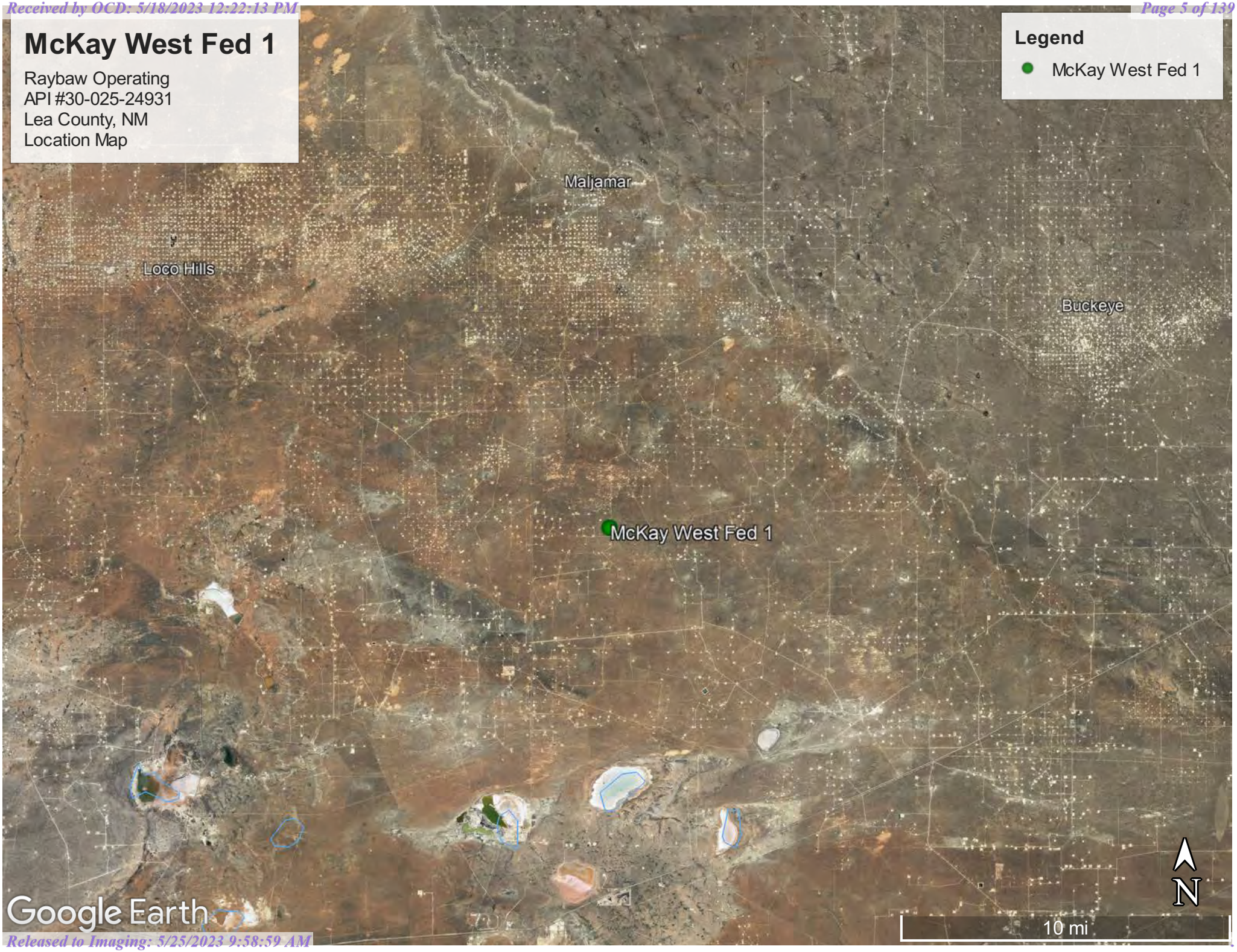
2-Topographic Map

3-Karst Map

4-Site Map

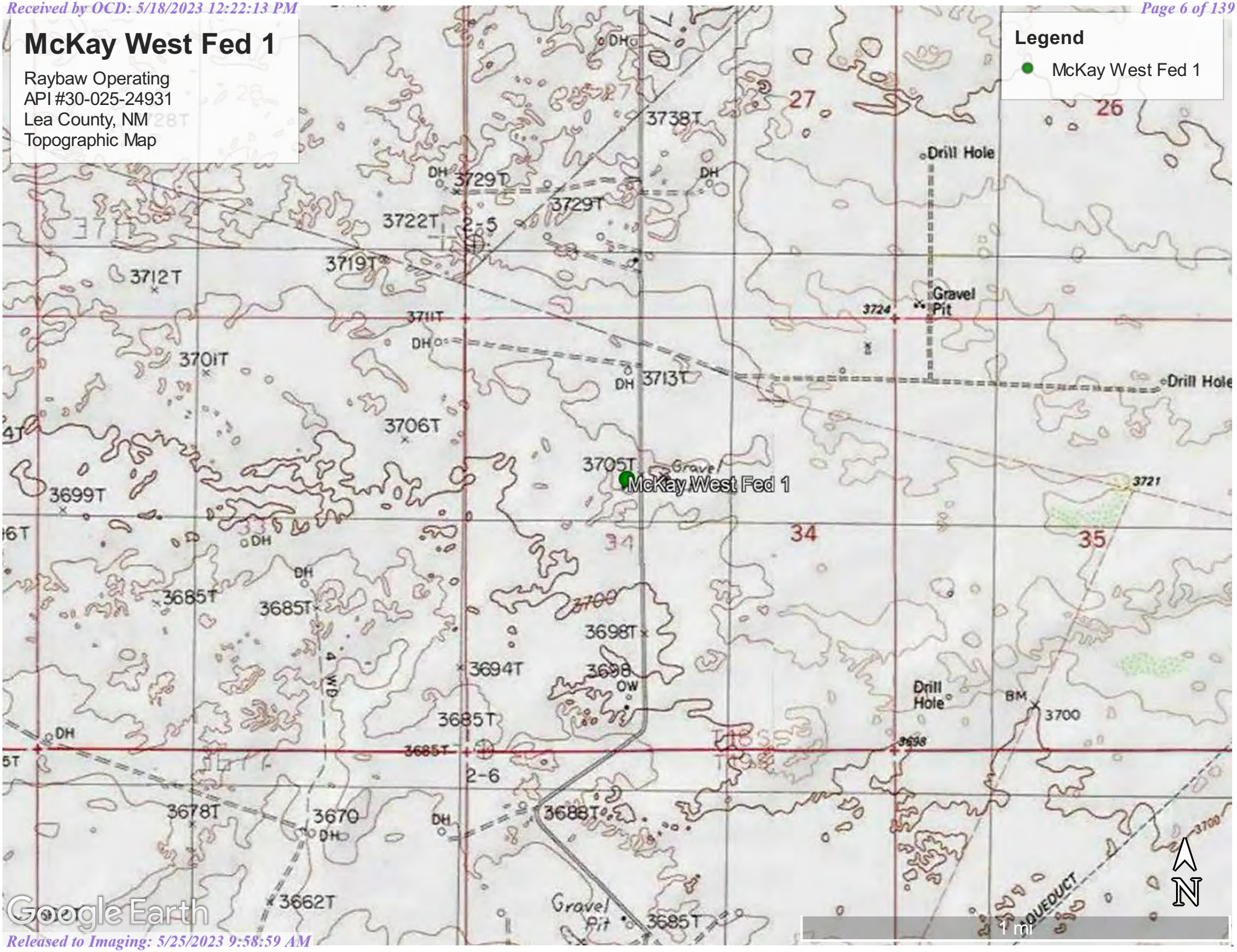
McKay West Fed 1

Raybaw Operating
API #30-025-24931
Lea County, NM
Location Map



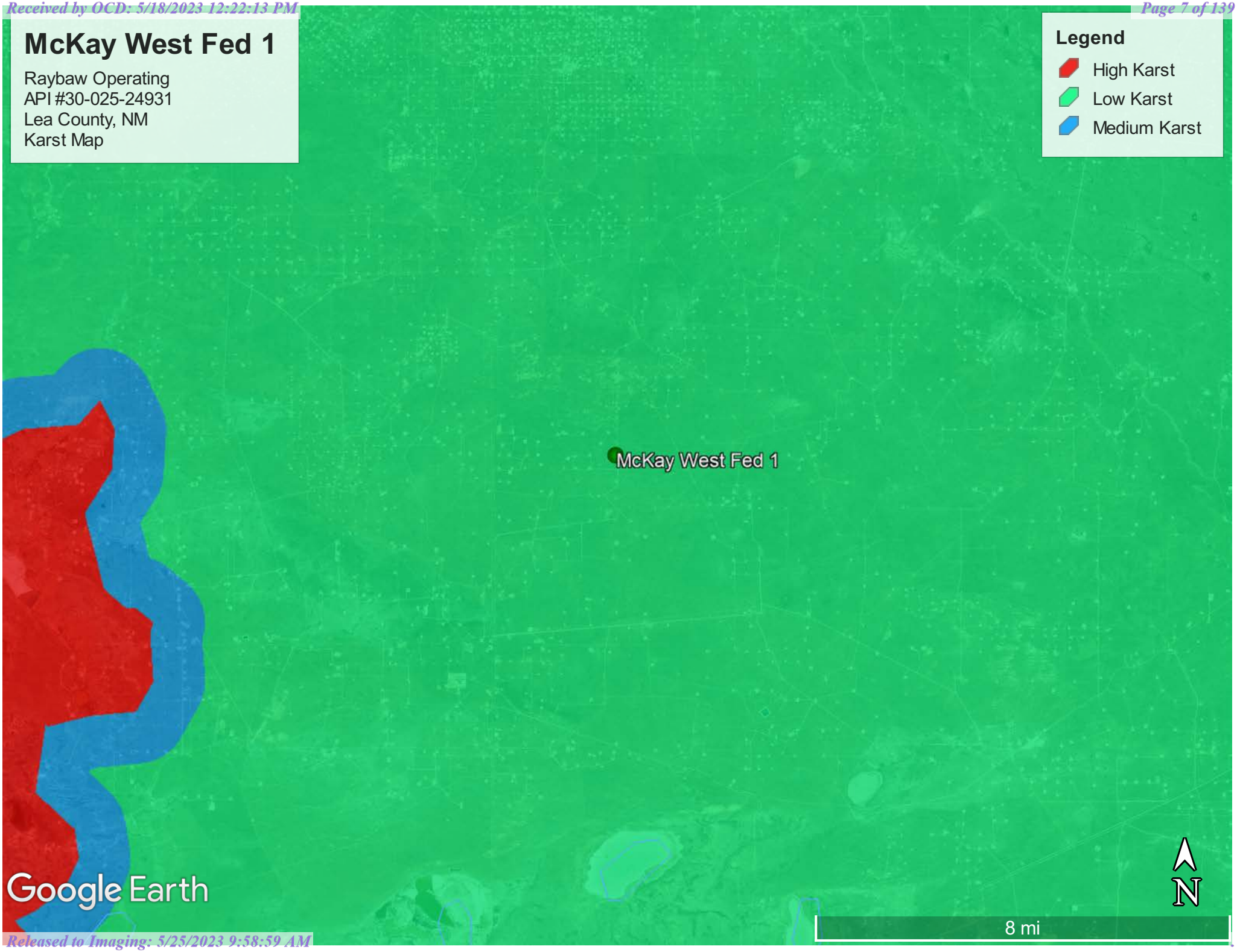
McKay West Fed 1

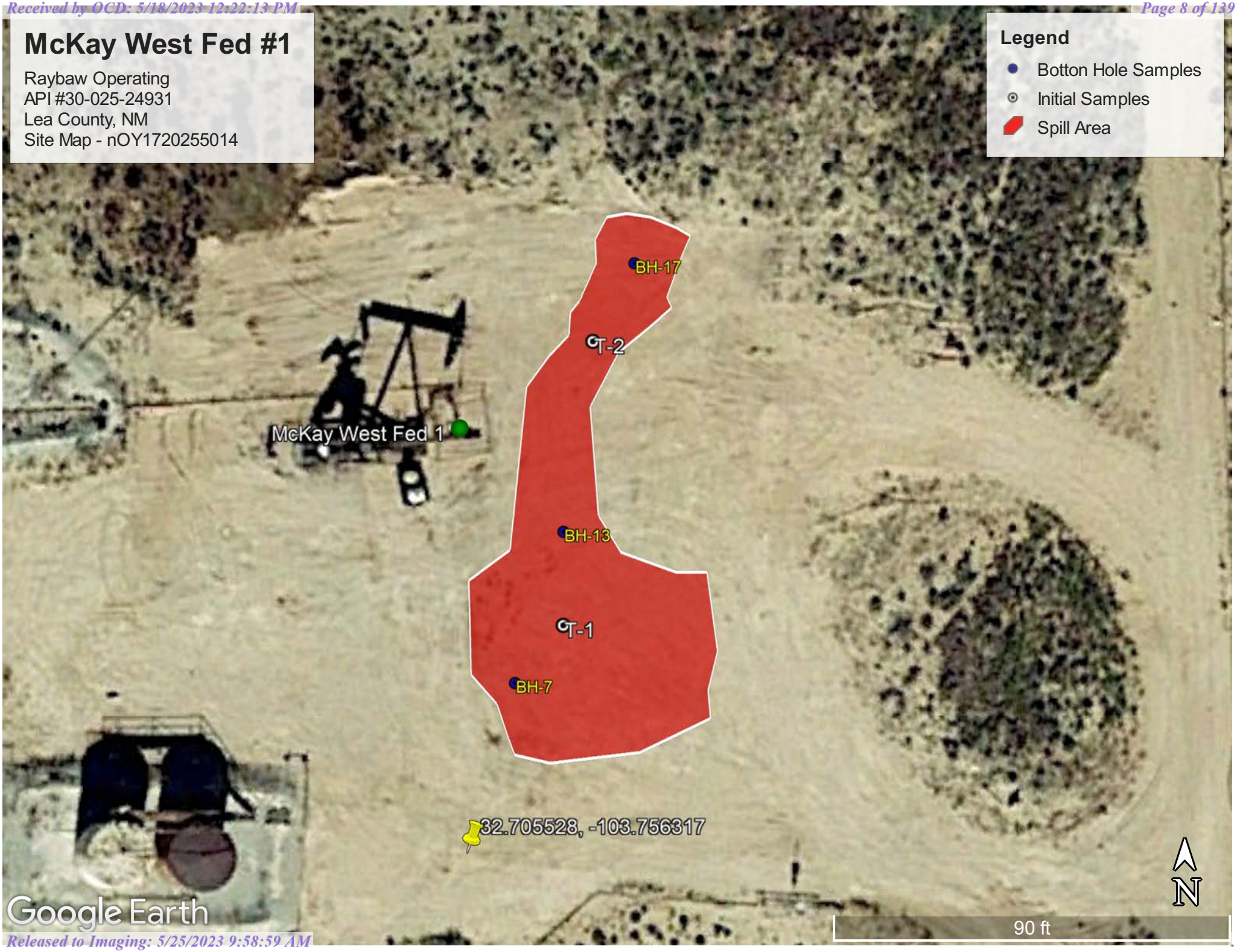
Raybaw Operating
API #30-025-24931
Lea County, NM
Topographic Map



McKay West Fed 1

Raybaw Operating
API #30-025-24931
Lea County, NM
Karst Map




McKay West Fed #1
Raybaw Operating
API #30-025-24931
Lea County, NM
Site Map - nOY1720255014
Legend
Botton Hole Samples
Initial Samples
Spill Area
BH-17
T-2
McKay West Fed 1
BH-13
T-1
BH-7
32.705528, -103.756317
Google Earth
N
90 ft

Pima Environmental Services

Appendix A

Water Surveys:

OSE

USGS

Surface Water Map

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	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00677		CP	LE		1	1	26	18S	32E	617750	3621373*	2363	700		
CP 01938 POD1		CP	LE	1	4	1	32	18S	32E	613277	3619332	3292	51		
CP 00812 POD1		CP	LE		4	4	01	19S	32E	620623	3616973*	4687	200		

Average Depth to Water: --
Minimum Depth: --
Maximum Depth: --

Record Count: 3

UTMNAD83 Radius Search (in meters):

Easting (X): 616568.79 **Northing (Y):** 3619325.57 **Radius:** 5000

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

4/23/23 10:42 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

- Explore the *NEW* USGS National Water Dashboard interactive map to access real-time water data from over 13,500 stations nationwide.
- Full News

Groundwater levels for the Nation

Important: Next Generation Monitoring Location Page

Search Results -- 1 sites found

site_no list =

- 324224103444101

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

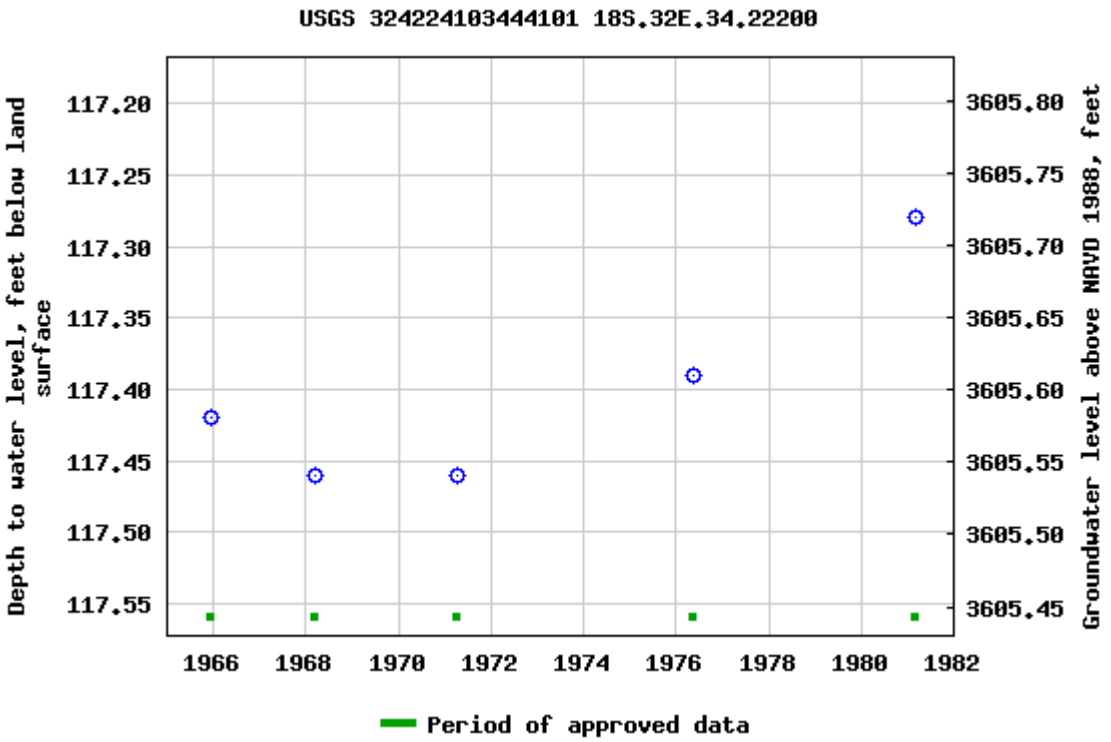
USGS 324224103444101 18S.32E.34.22200

Available data for this site | Groundwater: Field measurements | GO

Lea County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°42'24", Longitude 103°44'41" NAD27
Land-surface elevation 3,723 feet above NAVD88
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.

Output formats

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



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

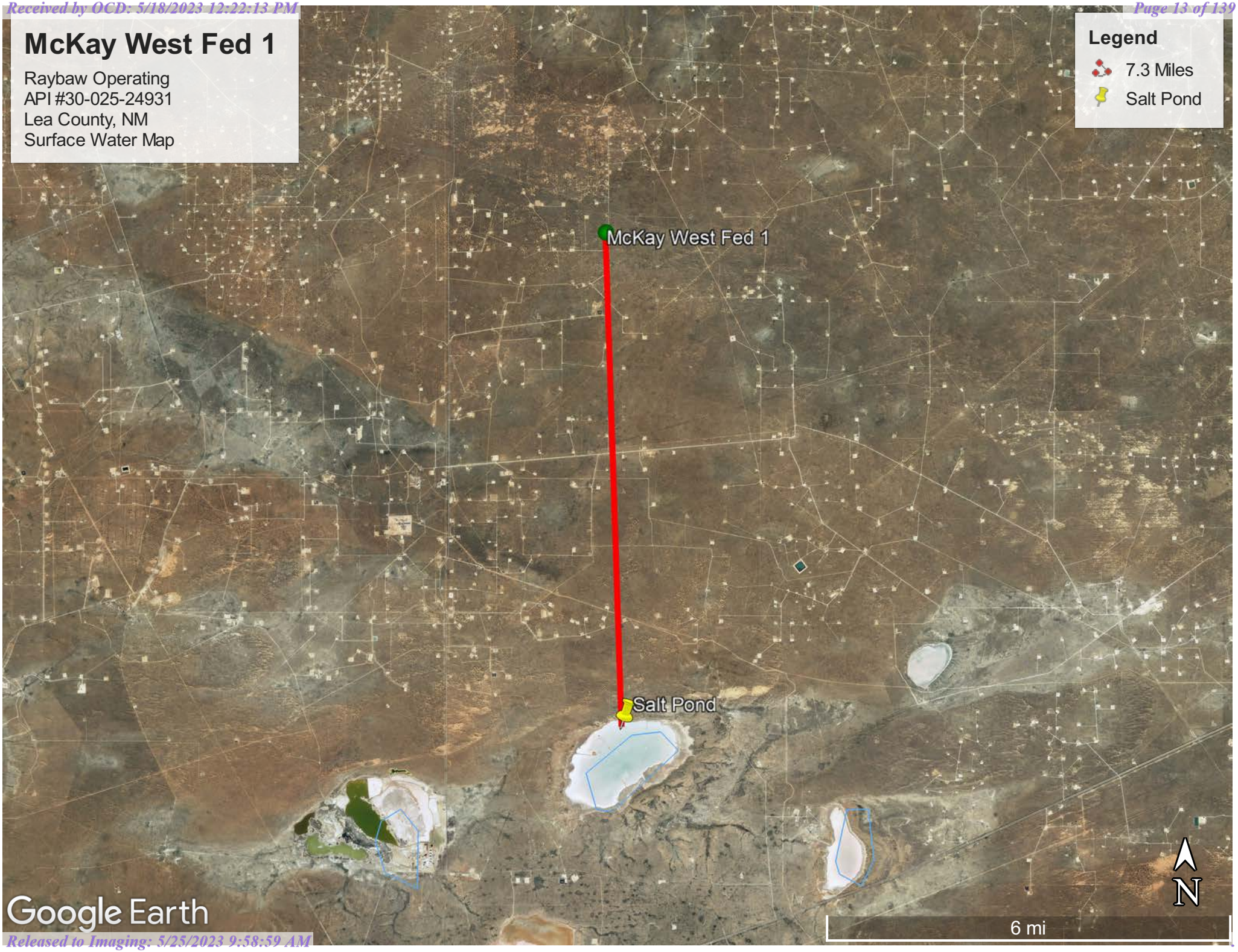
Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2023-04-23 12:47:01 EDT
0.59 0.51 nadww02

McKay West Fed 1

Raybaw Operating
API #30-025-24931
Lea County, NM
Surface Water Map



Pima Environmental Services

Appendix B

Soil Survey & Geological Data

FEMA Flood Map

Wetlands Map

Lea County, New Mexico

KD—Kermit-Palomas fine sands, 0 to 12 percent slopes

Map Unit Setting

National map unit symbol: dmpv
Elevation: 3,000 to 4,400 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Kermit and similar soils: 70 percent
Palomas and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kermit

Setting

Landform: Dunes
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear, convex
Across-slope shape: Convex
Parent material: Calcareous sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 8 inches: fine sand
C - 8 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
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
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A
Ecological site: R070BD005NM - Deep Sand
Hydric soil rating: No

Description of Palomas

Setting

Landform: Dunes
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear, concave
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone

Typical profile

A - 0 to 16 inches: fine sand
Bt - 16 to 60 inches: sandy clay loam
Bk - 60 to 66 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
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 content: 50 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Pyote

Percent of map unit: 4 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Maljamar

Percent of map unit: 4 percent

Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Palomas

Percent of map unit: 1 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Dune land

Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 19, Sep 8, 2022

National Flood Hazard Layer FIRMette

FEMA

103°45'42"W 32°42'36"N

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

1:6,000

103°45'4"W 32°42'5"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 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.

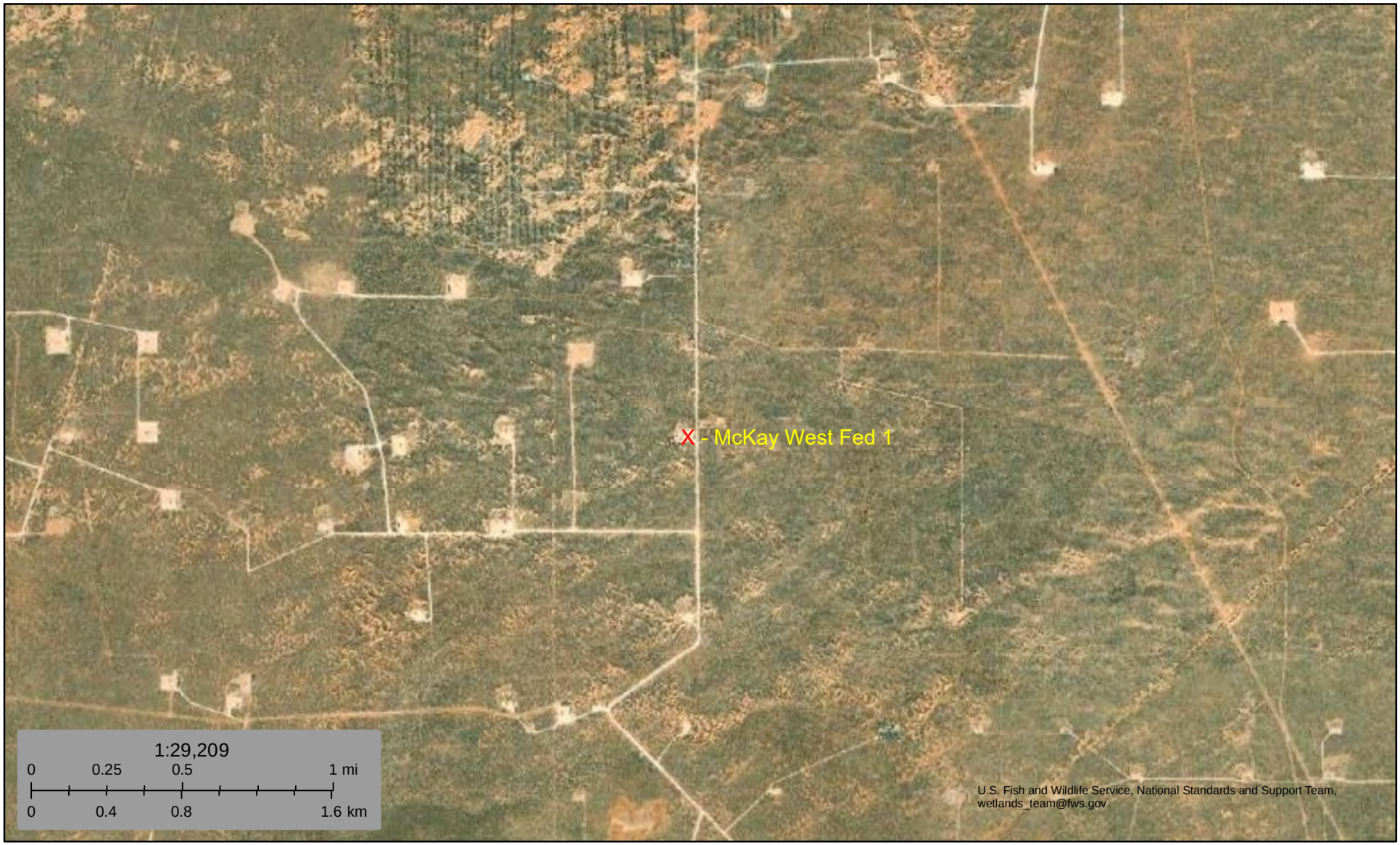
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/23/2023 at 12:46 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.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands Map



April 23, 2023

Wetlands

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

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

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

Pima Environmental Services

Appendix C

C-141 Form

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised April 3, 2017

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Marathon Oil Company	Contact Wendy Gram
Address 5555 San Felipe Street, Houston, Texas 77056	Telephone No. 701-690-6519 (cell) 713-296-2862 (office)
Facility Name McKay West Federal #1	Facility Type Oil and gas production facility

Surface Owner BLM	Mineral Owner BLM	API No. 30-025-24931

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	34	18S	32E	1980	North	1980	West	Lea

Latitude 32.7057343 **Longitude** -103.7562866 NAD83

NATURE OF RELEASE

Type of Release Spill	Volume of Release 6 barrels	Volume Recovered 6 barrels
Source of Release Pumping unit stuffing box	Date and Hour of Occurrence 7/2/2017	Date and Hour of Discovery 7/2/2017 4:00 PM.
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

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

RECEIVED
By Olivia Yu at 3:10 pm, Jul 21, 2017

Describe Cause of Problem and Remedial Action Taken.*
Stuffing box packing failure. Well was shut in.

Describe Area Affected and Cleanup Action Taken.*
Equipment repaired and impacted soils cleaned up.

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

Wendy Gram
Signature:

Printed Name: Wendy Gram

Title: Sr. HES Professional

E-mail Address: wwgram@marathonoil.com

Date: July 18, 2017
Phone: 701-690-6519 (cell) 713-296-2862 (office)

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: LGY

Approval Date: 7/21/2017 Expiration Date:

Conditions of Approval:
see attached directive

Attached ☑

* Attach Additional Sheets If Necessary

1RP-4759 nOY1720255014 pOY1720255341

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	nOY1720255014
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	<50 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

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

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

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

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nOY1720255014
District RP	
Facility ID	
Application ID	

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

Printed Name: Nancy J. Winn Title: Geoscience Analyst

Signature: Nancy J. Winn Date: 5/17/2023

email: nwinn@sbcglobal.net Telephone: 281-793-5452

OCD Only

Received by: Jocelyn Harimon Date: 05/19/2023

Form C-141
Page 6

State of New Mexico
Oil Conservation Division

Incident ID	nOY1720255014
District RP	
Facility ID	
Application ID	

Closure

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

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

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

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

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

☒ Description of remediation activities

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

Printed Name: Nancy J. Winn Title: Geoscience Analyst

Signature: Nancy J. Winn Date: 5/17/2023

email: nwinn@sbcglobal.net Telephone: 281-793-5452

OCD Only

Received by: Jocelyn Harimon Date: 05/19/2023

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

Closure Approved by: Jocelyn Harimon Date: 05/25/2023

Printed Name: Jocelyn Harimon Title: Environmental Specialist

Pima Environmental Services

Appendix D

Photographic Documentation


+32.705737,-103.756323
Lea County
Raybaw
Assessment
McKay West Fed #1
RAYBAW
Property Name & Well Number:
MCKAY WEST FEDERAL #1
API #: 30-025-24931


+32.705580,-103.756170
Lea County
Raybaw
Assessment
McKay West Fed #1


+32.705737,-103.756323
Lea County
Raybaw
Assessment
McKay West Fed #1


+32.705902,-103.756154
Lea County
Raybaw
Assessment
McKay West Fed #1

Pima Environmental Services

Appendix E

Laboratory Reports

Report to:

Tom Bynum

5796 U.S. Hwy 64
Farmington, NM 87401

Phone: (505) 632-1881
Envirotech-inc.com

envirotech

Practical Solutions for a Better Tomorrow

Analytical Report

Pima Environmental Services-Carlsbad

Project Name:	Mckay West Fed #1
Work Order:	E304077
Job Number:	21064-0001
Received:	4/14/2023

Revision: 1

Report Reviewed By:

Walter Hinchman
Laboratory Director
4/20/23

Date Reported: 4/20/23

Tom Bynum
PO Box 247
Plains, TX 79355-0247

Project Name: Mckay West Fed #1
Workorder: E304077
Date Received: 4/14/2023 8:30:00AM

Tom Bynum,

Thank you for choosing Envirotech, Inc. as your analytical testing laboratory for the sample(s) received on, 4/14/2023 8:30:00AM, under the Project Name: Mckay West Fed #1.

The analytical test results summarized in this report with the Project Name: Mckay West Fed #1 apply to the individual samples collected, identified and submitted bearing the project name on the enclosed chain-of-custody. Subcontracted sample analyses not conducted by Envirotech, Inc., are attached in full as issued by the subcontract laboratory.

Please review the Chain-of-Custody (COC) and Sample Receipt Checklist (SRC) for any issues reguarding sample receipt temperature, containers, preservation etc. To best understand your test results, review the entire report summarizing your sample data and the associated quality control batch data.

All reported data in this analytical report were analyzed according to the referenced method(s) and are in compliance with the latest NELAC/TNI standards, unless otherwise noted. Samples or analytical quality control parameters not meeting specific QC criteria are qualified with a data flag. Data flag definitions are located in the Notes and Definitions section of this analytical report.

If you have any questions concerning this report, please feel free to contact Envirotech, Inc.

Respectfully,

Walter Hinchman
Laboratory Director
Office: 505-632-1881
Cell: 775-287-1762
whinchman@envirotech-inc.com

Raina Schwanz
Laboratory Administrator
Office: 505-632-1881
rainaschwanz@envirotech-inc.com

Alexa Michaels
Sample Custody Officer
Office: 505-632-1881
labadmin@envirotech-inc.com

Field Offices:

Southern New Mexico Area
Lynn Jarboe
Technical Representative/Client Services
Office: 505-421-LABS(5227)
Cell: 505-320-4759
ljarboe@envirotech-inc.com

West Texas Midland/Odessa Area
Rayny Hagan
Technical Representative
Office: 505-421-LABS(5227)

Envirotech Web Address: www.envirotech-inc.com

Table of Contents

Sample Summary

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	**Reported:**
PO Box 247	Project Number:	21064-0001	
Plains TX, 79355-0247	Project Manager:	Tom Bynum	04/20/23 15:22

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
BH7 - 3'	E304077-01A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
BH7 - 4'	E304077-02A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
BH13 - 3'	E304077-03A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
BH13 - 4'	E304077-04A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
BH17 - 3'	E304077-05A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
BH17 - 4'	E304077-06A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
T1 - 3'	E304077-07A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
T1 - 4'	E304077-08A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
T2 - 3'	E304077-09A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.
T2 - 4'	E304077-10A	Soil	04/11/23	04/14/23	Glass Jar, 2 oz.

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH7 - 3'

E304077-01

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*96.0 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*94.6 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*105 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**83.9**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH7 - 4'

E304077-02

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*95.2 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*95.0 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*106 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**84.5**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH13 - 3'

E304077-03

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*97.1 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*94.1 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*104 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**94.4**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH13 - 4'

E304077-04

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*94.1 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*95.8 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*103 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**71.4**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH17 - 3'

E304077-05

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*94.8 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*98.9 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*103 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**85.1**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

BH17 - 4'

E304077-06

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/18/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/18/23	
Toluene	ND	0.0250	1	04/14/23	04/18/23	
o-Xylene	ND	0.0250	1	04/14/23	04/18/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/18/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/18/23	
Surrogate: 4-Bromochlorobenzene-PID		*94.5 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/18/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*97.2 %*	*70-130*	*04/14/23*	*04/18/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*106 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**90.6**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

T1 - 3'

E304077-07

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/19/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/19/23	
Toluene	ND	0.0250	1	04/14/23	04/19/23	
o-Xylene	ND	0.0250	1	04/14/23	04/19/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/19/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/19/23	
Surrogate: 4-Bromochlorobenzene-PID		*95.0 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/19/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*96.4 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*107 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**90.8**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

T1 - 4'

E304077-08

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/19/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/19/23	
Toluene	ND	0.0250	1	04/14/23	04/19/23	
o-Xylene	ND	0.0250	1	04/14/23	04/19/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/19/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/19/23	
Surrogate: 4-Bromochlorobenzene-PID		*95.2 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/19/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*99.8 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*103 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**82.2**	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

T2 - 3'

E304077-09

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/19/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/19/23	
Toluene	ND	0.0250	1	04/14/23	04/19/23	
o-Xylene	ND	0.0250	1	04/14/23	04/19/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/19/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/19/23	
Surrogate: 4-Bromochlorobenzene-PID		*94.8 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/19/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*96.4 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*103 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	ND	20.0	1	04/14/23	04/14/23	

Sample Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

T2 - 4'

E304077-10

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organics by EPA 8021B	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Benzene	ND	0.0250	1	04/14/23	04/19/23	
Ethylbenzene	ND	0.0250	1	04/14/23	04/19/23	
Toluene	ND	0.0250	1	04/14/23	04/19/23	
o-Xylene	ND	0.0250	1	04/14/23	04/19/23	
p,m-Xylene	ND	0.0500	1	04/14/23	04/19/23	
Total Xylenes	ND	0.0250	1	04/14/23	04/19/23	
Surrogate: 4-Bromochlorobenzene-PID		*93.9 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: SL			Batch: 2315073
Gasoline Range Organics (C6-C10)	ND	20.0	1	04/14/23	04/19/23	
Surrogate: 1-Chloro-4-fluorobenzene-FID		*97.0 %*	*70-130*	*04/14/23*	*04/19/23*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2316005
Diesel Range Organics (C10-C28)	ND	25.0	1	04/18/23	04/18/23	
Oil Range Organics (C28-C36)	ND	50.0	1	04/18/23	04/18/23	
Surrogate: n-Nonane		*103 %*	*50-200*	*04/18/23*	*04/18/23*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: BA			Batch: 2315089
Chloride	**97.0**	20.0	1	04/14/23	04/14/23	

QC Summary Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	**Reported:**
PO Box 247	Project Number:	21064-0001	
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

Volatile Organics by EPA 8021B

Analyst: SL

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2315073-BLK1)									Prepared: 04/14/23 Analyzed: 04/19/23
Benzene	ND	0.0250							
Ethylbenzene	ND	0.0250							
Toluene	ND	0.0250							
o-Xylene	ND	0.0250							
p,m-Xylene	ND	0.0500							
Total Xylenes	ND	0.0250							
Surrogate: 4-Bromochlorobenzene-PID	*7.73*		*8.00*		*96.6*	*70-130*			
LCS (2315073-BS1)									Prepared: 04/14/23 Analyzed: 04/19/23
Benzene	4.67	0.0250	5.00		93.4	70-130			
Ethylbenzene	4.68	0.0250	5.00		93.6	70-130			
Toluene	4.80	0.0250	5.00		96.0	70-130			
o-Xylene	4.79	0.0250	5.00		95.7	70-130			
p,m-Xylene	9.52	0.0500	10.0		95.2	70-130			
Total Xylenes	14.3	0.0250	15.0		95.4	70-130			
Surrogate: 4-Bromochlorobenzene-PID	*7.89*		*8.00*		*98.6*	*70-130*			
Matrix Spike (2315073-MS1)				**Source: E304077-03**					Prepared: 04/14/23 Analyzed: 04/19/23
Benzene	4.68	0.0250	5.00	ND	93.6	54-133			
Ethylbenzene	4.69	0.0250	5.00	ND	93.8	61-133			
Toluene	4.81	0.0250	5.00	ND	96.2	61-130			
o-Xylene	4.79	0.0250	5.00	ND	95.9	63-131			
p,m-Xylene	9.53	0.0500	10.0	ND	95.3	63-131			
Total Xylenes	14.3	0.0250	15.0	ND	95.5	63-131			
Surrogate: 4-Bromochlorobenzene-PID	*7.92*		*8.00*		*99.0*	*70-130*			
Matrix Spike Dup (2315073-MSD1)				**Source: E304077-03**					Prepared: 04/14/23 Analyzed: 04/19/23
Benzene	4.53	0.0250	5.00	ND	90.7	54-133	3.17	20	
Ethylbenzene	4.52	0.0250	5.00	ND	90.4	61-133	3.75	20	
Toluene	4.64	0.0250	5.00	ND	92.8	61-130	3.56	20	
o-Xylene	4.59	0.0250	5.00	ND	91.8	63-131	4.39	20	
p,m-Xylene	9.18	0.0500	10.0	ND	91.8	63-131	3.75	20	
Total Xylenes	13.8	0.0250	15.0	ND	91.8	63-131	3.96	20	
Surrogate: 4-Bromochlorobenzene-PID	*7.31*		*8.00*		*91.4*	*70-130*			

QC Summary Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	**Reported:**
PO Box 247	Project Number:	21064-0001	
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

Nonhalogenated Organics by EPA 8015D - GRO

Analyst: SL

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2315073-BLK1)									Prepared: 04/14/23 Analyzed: 04/19/23
Gasoline Range Organics (C6-C10)	ND	20.0							
Surrogate: 1-Chloro-4-fluorobenzene-FID	*7.68*		*8.00*		*96.0*	*70-130*			
LCS (2315073-BS2)									Prepared: 04/14/23 Analyzed: 04/18/23
Gasoline Range Organics (C6-C10)	44.1	20.0	50.0		88.3	70-130			
Surrogate: 1-Chloro-4-fluorobenzene-FID	*7.81*		*8.00*		*97.6*	*70-130*			
Matrix Spike (2315073-MS2)				**Source: E304077-03**					Prepared: 04/14/23 Analyzed: 04/18/23
Gasoline Range Organics (C6-C10)	37.3	20.0	50.0	ND	74.7	70-130			
Surrogate: 1-Chloro-4-fluorobenzene-FID	*7.62*		*8.00*		*95.3*	*70-130*			
Matrix Spike Dup (2315073-MSD2)				**Source: E304077-03**					Prepared: 04/14/23 Analyzed: 04/18/23
Gasoline Range Organics (C6-C10)	42.1	20.0	50.0	ND	84.2	70-130	12.0	20	
Surrogate: 1-Chloro-4-fluorobenzene-FID	*7.32*		*8.00*		*91.5*	*70-130*			

QC Summary Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	**Reported:**
PO Box 247	Project Number:	21064-0001	
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

Nonhalogenated Organics by EPA 8015D - DRO/ORO

Analyst: JL

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2316005-BLK1)									Prepared: 04/17/23 Analyzed: 04/17/23
Diesel Range Organics (C10-C28)	ND	25.0							
Oil Range Organics (C28-C36)	ND	50.0							
Surrogate: n-Nonane	*43.9*		*50.0*		*87.9*	*50-200*			
LCS (2316005-BS1)									Prepared: 04/17/23 Analyzed: 04/18/23
Diesel Range Organics (C10-C28)	249	25.0	250		99.5	38-132			
Surrogate: n-Nonane	*51.1*		*50.0*		*102*	*50-200*			
Matrix Spike (2316005-MS1)				**Source: E304082-01**					Prepared: 04/17/23 Analyzed: 04/17/23
Diesel Range Organics (C10-C28)	257	25.0	250	ND	103	38-132			
Surrogate: n-Nonane	*83.0*		*50.0*		*166*	*50-200*			
Matrix Spike Dup (2316005-MSD1)				**Source: E304082-01**					Prepared: 04/17/23 Analyzed: 04/17/23
Diesel Range Organics (C10-C28)	266	25.0	250	ND	107	38-132	3.47	20	
Surrogate: n-Nonane	*70.9*		*50.0*		*142*	*50-200*			

QC Summary Data

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	**Reported:**
PO Box 247	Project Number:	21064-0001	
Plains TX, 79355-0247	Project Manager:	Tom Bynum	4/20/2023 3:22:12PM

Anions by EPA 300.0/9056A

Analyst: BA

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2315089-BLK1)									Prepared: 04/14/23 Analyzed: 04/14/23
Chloride	ND	20.0							
LCS (2315089-BS1)									Prepared: 04/14/23 Analyzed: 04/14/23
Chloride	258	20.0	250		103	90-110			
Matrix Spike (2315089-MS1)				**Source: E304077-01**					Prepared: 04/14/23 Analyzed: 04/14/23
Chloride	335	20.0	250	83.9	100	80-120			
Matrix Spike Dup (2315089-MSD1)				**Source: E304077-01**					Prepared: 04/14/23 Analyzed: 04/14/23
Chloride	341	20.0	250	83.9	103	80-120	1.80	20	

QC Summary Report Comment:
Calculations are based off of the raw (non-rounded) data. However, for reporting purposes all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Definitions and Notes

Pima Environmental Services-Carlsbad	Project Name:	Mckay West Fed #1	
PO Box 247	Project Number:	21064-0001	**Reported:**
Plains TX, 79355-0247	Project Manager:	Tom Bynum	04/20/23 15:22

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
RPD	Relative Percent Difference
DNI	Did Not Ignite

Note (1): Methods marked with ** are non-accredited methods.

Note (2): Soil data is reported on an "as received" weight basis, unless reported otherwise.

Project Information | Chain of Custody | Page 1 of 1

Client: Pima Environmental Services	Bill To
Project: McKay West Fed #1	Attention: Raybaw
Project Manager: Tom Bynum	Address:
Address: 5614 N. Lovington Hwy.	City, State, Zip
City, State, Zip Hobbs, NM. 88240	Phone:
Phone: 580-748-1613	Email:
Email: tom@pimaoil.com	Pima Project # 26-7
Report due by:	

Lab Use Only: Lab WO# E304077 | Job Number 21064-0001

TAT: 1D | 2D | 3D | Standard X

EPA Program: CWA | SDWA | RCRA

State: NM X | CO | UT | AZ | TX

Analysis and Method: DRO/ORO by 8015 | GRO/DRO by 8015 | BTEX by 8021 | VOC by 8260 | Metals 6010 | Chloride 300.0 | BGDOC NM X | BGDOC TX

Time Sampled	Date Sampled	Matrix	No. of Containers	Sample ID	Lab Number
11:30	4/11/23	S	1	BH7-3'	1
11:35	"	"	"	BH7-4'	2
11:40	"	"	"	BH13-3'	3
11:45	"	"	"	BH13 4'	4
11:50	"	"	"	BH17-3'	5
11:55	"	"	"	BH17-4'	6
12:00	"	"	"	T1-3'	7
12:05	"	"	"	T1-4'	8
12:10	"	"	"	T2-3'	9
12:15	"	"	"	T2-4'	10

Remarks

Additional Instructions: Bill to Pima

I, (field sampler), attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabelling the sample location, date or time of collection is considered fraud and may be grounds for legal action. Sampled by: Adriana Benavidez

Samples requiring thermal preservation must be received on ice the day they are sampled or received packed in ice at an avg temp above 0 but less than 6 °C on subsequent days.

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
AB	4.13.23	2:00	Michelle Gonzales	4-13-23	1400
Michelle Gonzales	4-13-23	1600	Caitlin Christian	4/14/23	8:30
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

Lab Use Only — Received on ice: (Y) / N

T1 ____ T2 ____ T3 ____

AVG Temp °C 4

Sample Matrix: S - Soil, Sd - Solid, Sg - Sludge, A - Aqueous, O - Other ____

Container Type: g - glass, p - poly/plastic, ag - amber glass, v - VOA

Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at the client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for on the report.

envirotech

Envirotech Analytical Laboratory

Printed: 4/14/2023 10:38:02AM

Sample Receipt Checklist (SRC)

Instructions: Please take note of any NO checkmarks.
If we receive no response concerning these items within 24 hours of the date of this notice, all the samples will be analyzed as requested.

Client:	Pima Environmental Services-Carlsbad	Date Received:	04/13/23 08:30	Work Order ID:	E304077
Phone:	(575) 631-6977	Date Logged In:	04/13/23 17:12	Logged In By:	Alexa Michaels
Email:	tom@pimaoil.com	Due Date:	04/19/23 17:00 (4 day TAT)		

Chain of Custody (COC)

1. Does the sample ID match the COC?	Yes	
2. Does the number of samples per sampling site location match the COC	Yes	
3. Were samples dropped off by client or carrier?	Yes	Carrier: Courier
4. Was the COC complete, i.e., signatures, dates/times, requested analyses?	Yes	
5. Were all samples received within holding time? Note: Analysis, such as pH which should be conducted in the field, i.e, 15 minute hold time, are not included in this disucssion.	Yes	

Comments/Resolution

Sample Turn Around Time (TAT)

6. Did the COC indicate standard TAT, or Expedited TAT?	Yes	

Sample Cooler

7. Was a sample cooler received?	Yes	
8. If yes, was cooler received in good condition?	Yes	
9. Was the sample(s) received intact, i.e., not broken?	Yes	
10. Were custody/security seals present?	No	
11. If yes, were custody/security seals intact?	NA	
12. Was the sample received on ice? If yes, the recorded temp is 4°C, i.e., 6°±2°C Note: Thermal preservation is not required, if samples are received w/i 15 minutes of sampling	Yes	
13. If no visible ice, record the temperature. Actual sample temperature: 4°C		

Sample Container

14. Are aqueous VOC samples present?	No	
15. Are VOC samples collected in VOA Vials?	NA	
16. Is the head space less than 6-8 mm (pea sized or less)?	NA	
17. Was a trip blank (TB) included for VOC analyses?	NA	
18. Are non-VOC samples collected in the correct containers?	Yes	
19. Is the appropriate volume/weight or number of sample containers collected?	Yes	

Field Label

20. Were field sample labels filled out with the minimum information:		
Sample ID?	Yes	
Date/Time Collected?	Yes	
Collectors name?	No	

Sample Preservation

21. Does the COC or field labels indicate the samples were preserved?	No	
22. Are sample(s) correctly preserved?	NA	
24. Is lab filteration required and/or requested for dissolved metals?	No	

Multiphase Sample Matrix

26. Does the sample have more than one phase, i.e., multiphase?	No	
27. If yes, does the COC specify which phase(s) is to be analyzed?	NA	

Subcontract Laboratory

28. Are samples required to get sent to a subcontract laboratory?	No	
29. Was a subcontract laboratory specified by the client and if so who?	NA	Subcontract Lab: NA

Client Instruction

Signature of client authorizing changes to the COC or sample disposition.

Date

envirotech Inc.

Pima Environmental Services

Appendix F

NMOCD-rejected Closure Report

SITE INFORMATION

Report Type: Closure Report 1RP-4759

General Site Information:						
Site:	McKay West Federal #1					
Company:	Marathon Oil Company					
Section, Township and Range	Unit F	Sec. 34	T 18S	R 32E		
Lease Number:	API No. 30-025-24931					
County:	Lea County					
GPS:	32.70564º N			103.75589º W		
Surface Owner:	BLM					
Mineral Owner:	BLM					
Directions:	FRM INTERSECTION OF US-82 AND CR-89, GO S ON CR-89 4.5MI, TRN E ON MIDWAY RD 1.86MI, TRN N 0.25MI, TRN W 0.5MI TO LOCATION.					

Release Data:		
Date Released:	7/2/2017	
Type Release:	Crude Oil	
Source of Contamination:	Pumping Unit Stuffing Box	
Fluid Released:	6 bbls	
Fluids Recovered:	6 bbls	

Official Communication:			
Name:	Callie Karrigan		Clair Gonzales
Company:	Martathon Oil Company		Tetra Tech
Address:	2423 Bonita Street		901 West Wall St
			Suite 100
City:	Carlsbad, New Mexico		Midland, Texas
Phone number:	405-202-1028		(432) 687-8123
Fax:			
Email:	cnkarrigan@marathonoil.com		clair.gonzales@tetratech.com

Site Characterization	
Depth to Groundwater:	*117' below surface*
Karst Potential:	*Low*

Recommended Remedial Action Levels (RRALs)				
Benzene	***Total BTEX***	***TPH (GRO+DRO)***	***TPH (GRO+DRO+MRO)***	***Chlorides***
10 mg/kg	*50 mg/kg*	*1,000 mg/kg*	*2,500 mg/kg*	*20,000 mg/kg*

TETRA TECH

November 8, 2018

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

Re: Closure Report for the Marathon Oil Company, McKay West Federal #1 Tank Battery, Unit F, Section 34, Township 18 South, Range 32 East, Lea County, New Mexico. 1RP-4759.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by Marathon Oil Company(Marathon) to evaluate and assess a release that occurred at the McKay West Federal #1 Tank Battery, Unit F, Section 34, Township 18 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.70564º, W 103.75589º. The site location is shown on Figures 1 and 2.

Background

According to the Initial C-141 form, the release occurred on July 2, 2017, and released 6 barrels of fluids due to a stuffing box packing failure. Approximately 6 barrels of fluids were recovered, and the area was scraped to address the surficial staining. The release occurred on the pad area and impacted an area measuring approximately 50' x 40' and 75' x 10'. The initial C-141 form is included in Appendix A.

On October 4, 2018, during the remediation of 1RP-5018, a non-reportable release occurred on the same spill footprint as 1RP-4759. As part of the response for the non-reportable release, the impacted area around the well head was addressed.

Groundwater

There were no wells listed in Section 34 on the New Mexico Office of the State Engineers database. One well is listed in Section 34 .65 miles East of the site on the USGS National Water Information system with reported depth to groundwater of 117 feet below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is around 175' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
901 West Wall , Suite 101, Midland, TX 79701
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

TETRA TECH

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, updated August 14, 2018. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). The proposed RRAL for TPH is 2,500 mg/kg (GRO + DRO + ORO) and 1,000 mg/kg (GRO + DRO). Additionally, based on the reported depth to groundwater in the area, the proposed RRAL for chlorides is 20,000 mg/kg.

Soil Assessment and Analytical Results

On September 25, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. Two (2) backhoe trenches (T-1 and T-2) were installed in the spill footprint to total depths of 4.5'-5.5' below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, none of the samples collected showed benzene, total BTEX, or chloride concentrations above the RRALs. However, TPH concentrations above the 2,500 mg/kg threshold were detected in the shallow soils. The area of trench (T-1) showed a TPH high of 7,400 mg/kg at 3.5'-4.5', which declined with depth to 15.2 mg/kg at 4.5'-5.5' below surface. The area of trench (T-2) showed a TPH concentration of 2,782 mg/kg at 1.0'-2.5', which also declined with depth to 514 mg/kg at 2.5'-3.5' and showed a bottom trench concentration of <10.0 mg/kg at 4.5'-5.5' below surface.

Remediation Activities

On October 15-18, 2018 Tetra Tech personnel were on site to supervise and oversee the remediation activities. The area of trench (T-1) was excavated to 3.0'-3.5' and (T-2) was excavated to a depth of 1.5' below surface. Five-point composite confirmation samples were taken every 200 square feet to ensure proper removal of the impacted areas. The samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C.

Referring to Table 1, none of the samples collected showed benzene, total BTEX, or chloride concentrations above the RRALs. However, Bottom Hole 4 at a depth of 3.0' below surface showed a TPH concentration of 1,259 mg/kg. The area of bottom hole 4 was excavated to 3.5' below surface to address the remaining impact and resampled.

TETRA TECH

Approximately 300 cubic yards of contaminated soil was transported offsite for proper disposal and the areas were backfilled with clean material to surface grade.

Conclusion

Based on the remediation activities performed and laboratory data, Marathon requests closure of this spill issue. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

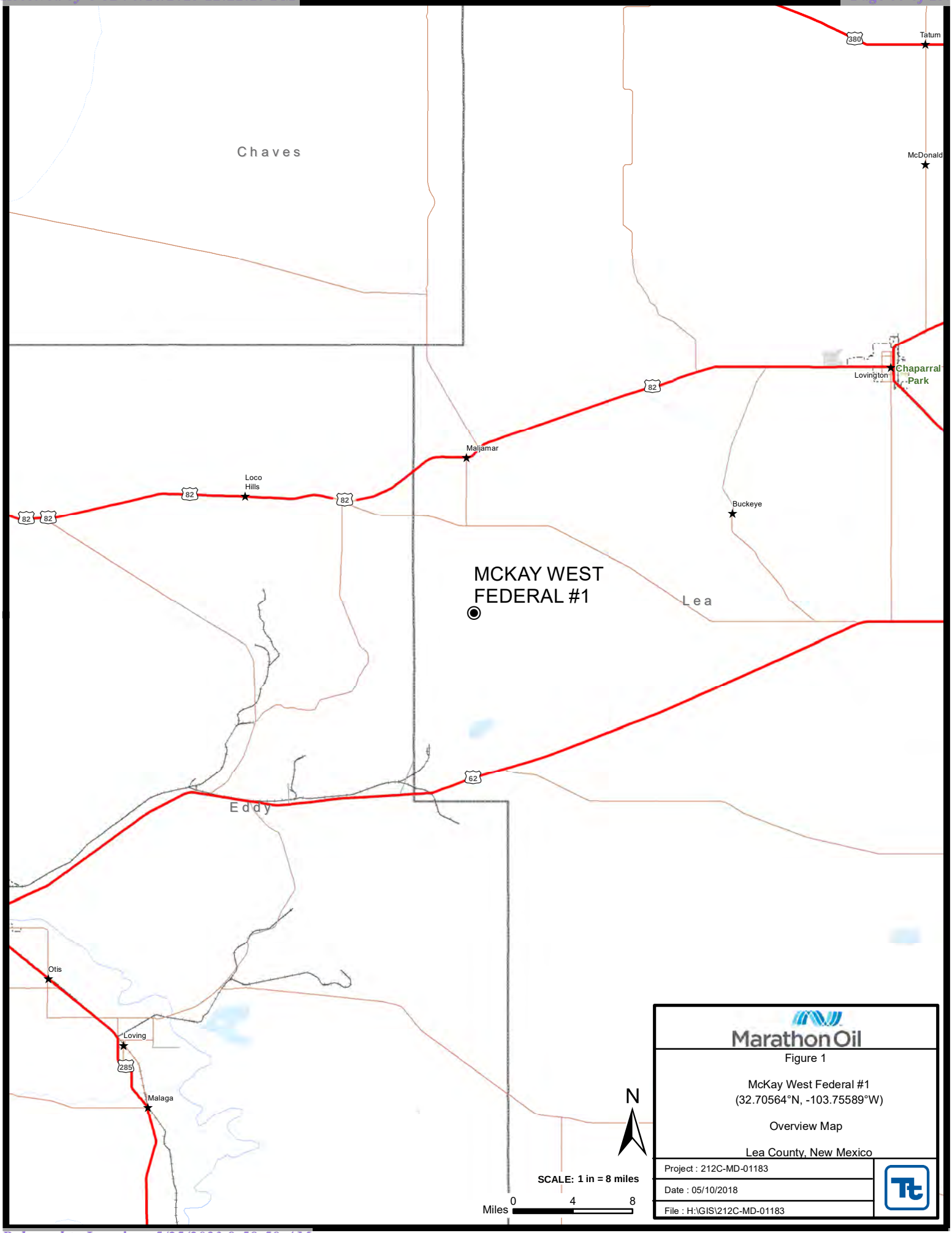
Respectfully submitted,
TETRA TECH

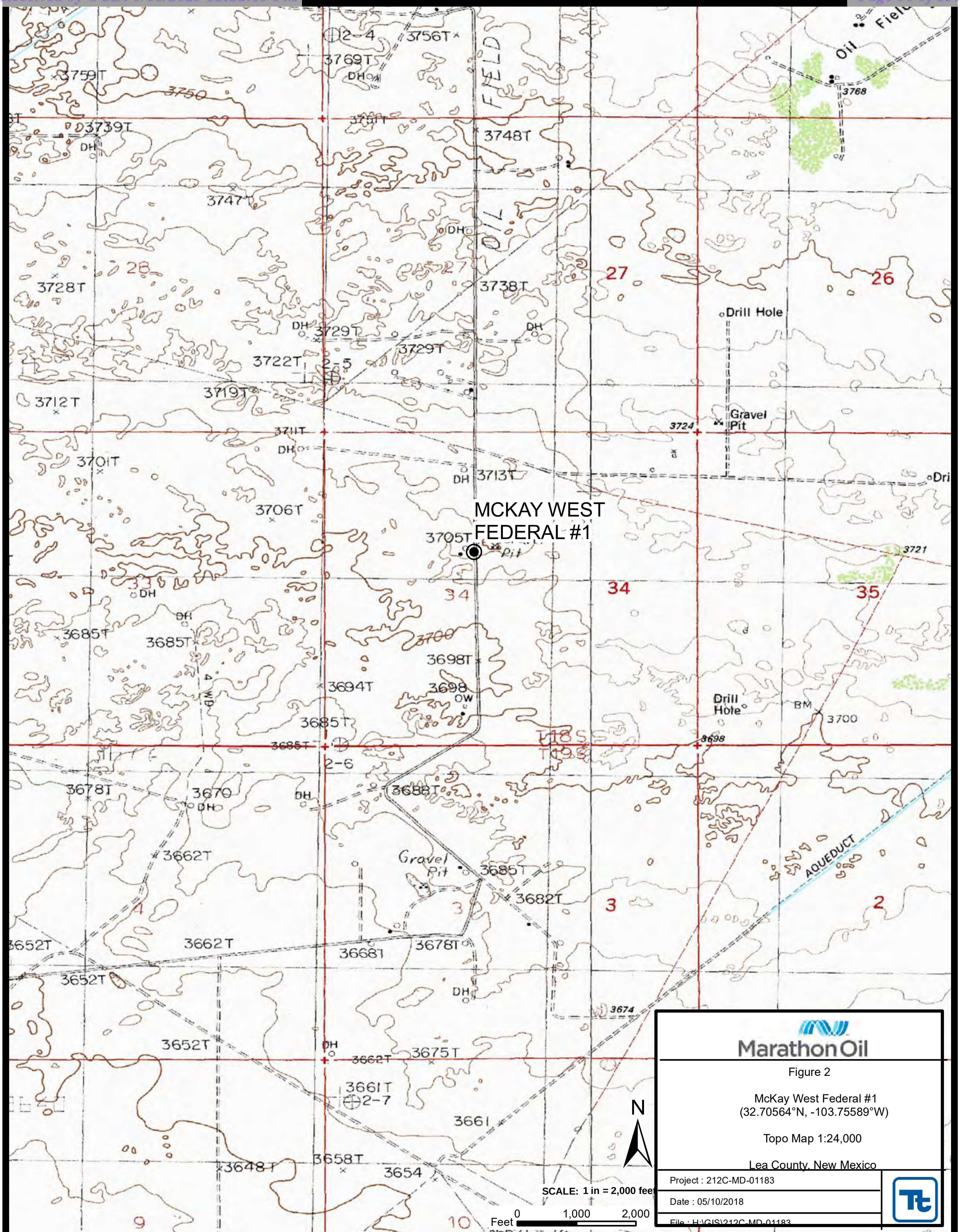
Clair Gonzales,
Project Manager

Mike Carmona
Geologist

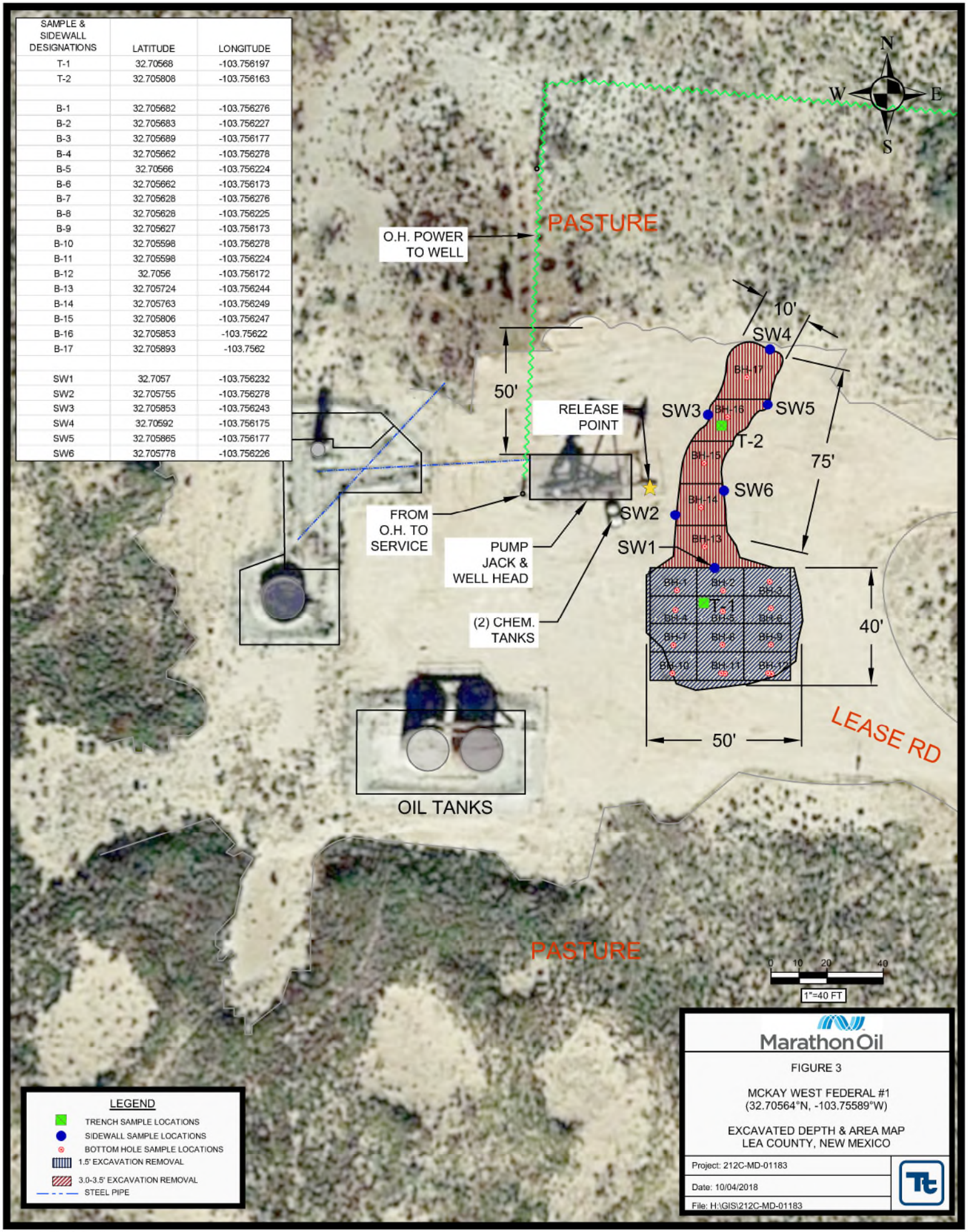
cc: Shelly Tucker – BLM
Henryetta Price – BLM
Callie Karrigan - Marathon

Figures


Chaves
Tatum
McDonald
Lovington
Chaparral Park
Maljamar
Loco Hills
Buckeye
MCKAY WEST FEDERAL #1
Lea
Eddy
Otis
Loving
Malaga
380
82
62
285
N
SCALE: 1 in = 8 miles
Miles 0 4 8
Marathon Oil
Figure 1
McKay West Federal #1
(32.70564°N, -103.75589°W)
Overview Map
Lea County, New Mexico
Project : 212C-MD-01183
Date : 05/10/2018
File : H:\GIS\212C-MD-01183


MCKAY WEST
FEDERAL #1
3705T
Pit
3759T
3769T
3756T
3739T
3748T
3747T
3738T
3729T
3722T
3719T
3712T
3711T
3713T
3701T
3706T
3728T
3685T
3698T
3694T
3698
OW
3688T
3678T
3670
3662T
Gravel
Pit
3685T
3682T
3652T
3668T
3678T
3675T
3661T
3661
3658T
3654
3648T
3700
3750
3724
3768
3721
3698
3674
Drill Hole
Gravel
Pit
Drill
Hole
BM
AQUEDUCT
OIL
FIELD
Oil
T18S
T19S
28
27
26
33
34
35
4
3
2
9
10
DH
2-4
2-5
2-6
2-7
N
SCALE: 1 in = 2,000 feet
Feet 0 1,000 2,000
Marathon Oil
Figure 2
McKay West Federal #1
(32.70564°N, -103.75589°W)
Topo Map 1:24,000
Lea County, New Mexico
Project : 212C-MD-01183
Date : 05/10/2018

SAMPLE & SIDEWALL DESIGNATIONS	LATITUDE	LONGITUDE
T-1	32.70568	-103.756197
T-2	32.705808	-103.756163
B-1	32.705682	-103.756276
B-2	32.705683	-103.756227
B-3	32.705689	-103.756177
B-4	32.705662	-103.756278
B-5	32.70566	-103.756224
B-6	32.705662	-103.756173
B-7	32.705628	-103.756276
B-8	32.705628	-103.756225
B-9	32.705627	-103.756173
B-10	32.705598	-103.756278
B-11	32.705598	-103.756224
B-12	32.7056	-103.756172
B-13	32.705724	-103.756244
B-14	32.705763	-103.756249
B-15	32.705806	-103.756247
B-16	32.705853	-103.75622
B-17	32.705893	-103.7562
SW1	32.7057	-103.756232
SW2	32.705755	-103.756278
SW3	32.705853	-103.756243
SW4	32.70592	-103.756175
SW5	32.705865	-103.756177
SW6	32.705778	-103.756226



Drawn By: MISTI MORGAN

Tables

Table 1
Marathon Oil Company
McKay West Federal #1
1RP-4759
Lea County, New Mexico

Sample ID	Sample Date	Sample Interval (ft)	BEB (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	MRO	Total						
T-1	9/25/2018	1.0-2.5	-		X	**270**	**5,290**	**879**	**6,439**	<0.050	0.0550	<0.050	0.817	0.873	112
	"	2.5-3.5	-		X	**145**	**4,560**	**866**	**5,426**	<0.050	<0.050	<0.050	0.885	0.914	224
	"	3.5-4.5	-	X		**222**	**6,310**	**1,090**	**7,400**	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
	"	4.5-5.5	-	X		<10.0	15.2	<10.0	15.2	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole -1	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole-2	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole-3	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
Bottom Hole-4	10/17/2018	-	3		X	**17.2**	**1,060**	**182**	**1,259**	<0.050	<0.050	0.149	0.236	0.385	176
Bottom Hole-4A	10/22/2018	-	3.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole-5	10/17/2018	-	3	X		<10.0	31.7	12.5	44.2	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
Bottom Hole-6	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole -7	10/17/2018	-	3	X		<10.0	420	58.6	479	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
Bottom Hole-8	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole-9	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole-10	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	<16.0
Bottom Hole-11	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	<16.0
Bottom Hole-12	10/17/2018	-	3	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
North Sidewall	10/17/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
East Sidewall	10/17/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
South Sidewall	10/17/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
West Sidewall	10/17/2018	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0

Table 1
Marathon Oil Company
McKay West Federal #1
1RP-4759
Lea County, New Mexico

Sample ID	Sample Date	Sample Interval (ft)	BEB (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	MRO	Total						
T-2	9/25/2018	1.0-2.5	-		X	<50.0	**2,410**	**372**	**2,782**	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
	"	2.5-3.5	-	X		<10.0	455	59.2	514	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
	"	3.5-4.5	-	X		<10.0	388	71.0	459	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
	"	4.5-5.5	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole -13	10/18/2018	-	1.5	X		<15.0	95.3	17.4	113	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	25.7
Bottom Hole-14	10/18/2018	-	1.5	X		<15.0	19.2	<15.0	19.2	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	17.6
Bottom Hole-15	10/18/2018	-	1.5	X		<14.9	35.0	<14.9	35.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	16.8
Bottom Hole-16	10/18/2018	-	1.5	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	17.2
Bottom Hole-17	10/18/2018	-	1.5	X		<15.0	113	23.4	136	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	21.2
North Sidewall	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.050	<0.00199	<0.00199	<0.00199	<0.00199	101
South Sidewall	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	20.0
West Sidewall 1	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	47.5
West Sidewall 2	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	17.3
East Sidewall 1	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	19.0
East Sidewall 2	10/18/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	17.0

Excavation Depths

BEB — Below Excavation Bottom

(-) — Not Analyzed

Photos

Marathon Oil Company
McKay West Federal #1
Lea County, New Mexico

TETRA TECH

View East Excavated area of T-1

View Northeast Excavated area of T-1

Marathon Oil Company
McKay West Federal #1
Lea County, New Mexico

TETRA TECH

View East Excavated area of T-1 Bottom Hole 4 (3.5')

View South excavated area of T-2

Marathon Oil Company
McKay West Federal #1
Lea County, New Mexico

TETRA TECH

View North Excavated area of T-2

View North Backfilled area of T-1 and T-2

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised April 3, 2017

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Marathon Oil Company	Contact Wendy Gram
Address 5555 San Felipe Street, Houston, Texas 77056	Telephone No. 701-690-6519 (cell) 713-296-2862 (office)
Facility Name McKay West Federal #1	Facility Type Oil and gas production facility

Surface Owner BLM	Mineral Owner BLM	API No. 30-025-24931

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	34	18S	32E	1980	North	1980	West	Lea

Latitude 32.7057343 **Longitude** -103.7562866 NAD83

NATURE OF RELEASE

Type of Release Spill	Volume of Release 6 barrels	Volume Recovered 6 barrels
Source of Release Pumping unit stuffing box	Date and Hour of Occurrence 7/2/2017	Date and Hour of Discovery 7/2/2017 4:00 PM.
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

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

RECEIVED
By Olivia Yu at 3:10 pm, Jul 21, 2017

Describe Cause of Problem and Remedial Action Taken.*
Stuffing box packing failure. Well was shut in.

Describe Area Affected and Cleanup Action Taken.*
Equipment repaired and impacted soils cleaned up.

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

Wendy Gram
Signature:

Printed Name: Wendy Gram

Title: Sr. HES Professional

E-mail Address: wwgram@marathonoil.com

Date: July 18, 2017
Phone: 701-690-6519 (cell) 713-296-2862 (office)

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: LGY

Approval Date: 7/21/2017 Expiration Date:

Conditions of Approval:
see attached directive

Attached ☑

* Attach Additional Sheets If Necessary

1RP-4759 nOY1720255014 pOY1720255341

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _7/18/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4759__ has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before _8/21/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

● Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

● Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

● Nominal detection limits for field and laboratory analyses must be provided.

● Composite sampling is not generally allowed.

● Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

●Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

● If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

● Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

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

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

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

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

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: _____ Title: _____

Signature: Callie Karrigan _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

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

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

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

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

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

☐ Description of remediation activities

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

Printed Name: _____ Title: _____

Signature: Callie Karrigan Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Marathon-McKay West Federal #1
Lea County, New Mexico

17 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 271	35	36

17 South 32 East

6	5	4 82 Maljamar	3 175	2 60	1 225
7	8	9	10 132	11 70 88	12 120
18	17	16	15	14	13
19	20	21	22	23	24
30 180 dry	29	28	27	26	25
31	32	33	34	35	36

17 South 33 East

6 90	5	4	3 155	2 158	1 150
7 167	8 173	9 161	10	11	12
18 188	17 180	16	15	14	13 165
19	20 190	21	22	23 115	24
30 69	29 60	28	27	26	25
31	32	33 120	34	35 155	36

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 400
18	17	16	15 98	14 317	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35 261	36

18 South 32 East

6	5	4 65	3	2	1
7 460 82	8	9	10	11	12
18	17	16 84	15	14	13
19	20 164	21	22 429	23	24
30	29	28	27	26	25
31	32	33	34 117	35	36

18 South 33 East

6	5	4	3 60	2	1
7	8 100	9	10 62	11 46	12 143 140
18	17 85	16	15	14 36	13 60
19 >140	20	21	22	23	24 195
30 35	29	28	27	26	25
31	32	33 177	34	35	36

19 South 31 East

6	5 SITE	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19 180	20	21	22	23	24
30	29	28 180	27	26	25
31	32	33 101 140	34	35	36 130

19 South 32 East

6	5	4	3	2	1
7	8 365	9	10	11	12
18	17	16	15	14	13 135 dry
19 102	20 345	21	22	23	24
30	29	28	27	26	25
31	32	33	34 250	35	36

19 South 33 East

6	5	4	3	2	1
7	8	9	10	11	12
18 340	17 116	16	15	14	13
19	20	21	22	23	24
30	29	28 130 dry	27	26 92 85	25
31	32 185	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

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

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y		Depth Well	Depth Water	Water Column
CP 00566 POD1		CP	LE	4	4	1	04	18S	32E	614960	3627280*		133	65	68
CP 00672		CP	LE		4	4	07	18S	32E	612475	3624947*		524	430	94
CP 00672 CLW475398	O	CP	LE		4	4	07	18S	32E	612475	3624947*		540	460	80
CP 00677		CP	LE		1	1	26	18S	32E	617750	3621373*		700		
CP 00814 POD1		CP	LE		2	2	08	18S	32E	614074	3626168*		480		

Average Depth to Water: **318 feet**

Minimum Depth: **65 feet**

Maximum Depth: **460 feet**

Record Count: 5

PLSS Search:

Township: 18S **Range:** 32E

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

11/8/18 12:39 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Click to hide News Bulletins

- Please see news on new formats
- **UPDATE, 11/6: The USGS continues to make progress on restoring all of its gages. Less than 1 percent of USGS streamgages are still not transmitting due to an issue with the satellite telemetry system that records and transmits data. Once all operational gages are brought back online, the USGS will focus on restoring other equipment that experienced the telemetry issues, including about 85 rapid deployment gages that are used periodically for emergency response. Read more**
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

site_no list =
- 324224103444101

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

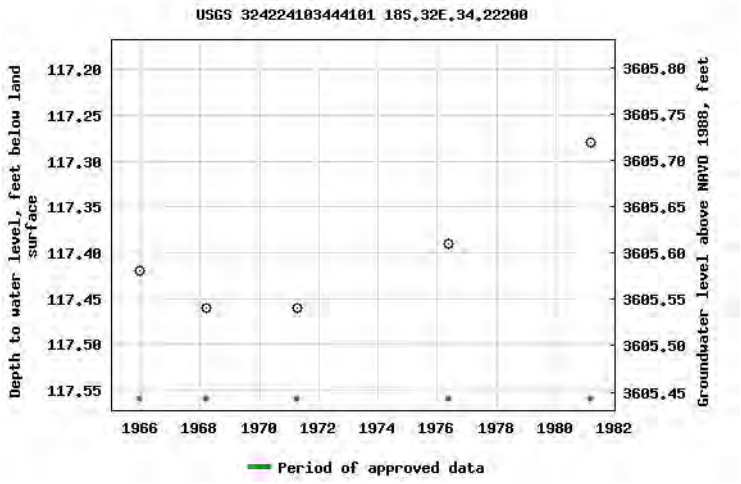
USGS 324224103444101 18S.32E.34.22200

Available data for this site: Groundwater: Field measurements | GO

Lea County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°42'24", Longitude 103°44'41" NAD27
Land-surface elevation 3,723 feet above NAVD88
This well is completed in the Chinle Formation (231CHNL) local aquifer.

Output formats

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



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

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help

Data Tips
Explanation of terms
Subscribe for system changes
News

Click to hide News Bulletins

- Please see news on new formats
- **UPDATE, 11/6: The USGS continues to make progress on restoring all of its gages. Less than 1 percent of USGS streamgages are still not transmitting due to an issue with the satellite telemetry system that records and transmits data. Once all operational gages are brought back online, the USGS will focus on restoring other equipment that experienced the telemetry issues, including about 85 rapid deployment gages that are used periodically for emergency response. Read more**
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 324224103444101

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

USGS 324224103444101 18S.32E.34.22200

Lea County, New Mexico
Latitude 32°42'24", Longitude 103°44'41" NAD27
Land-surface elevation 3,723 feet above NAVD88
This well is completed in the Chinle Formation (231CHNL) local aquifer.

Output formats

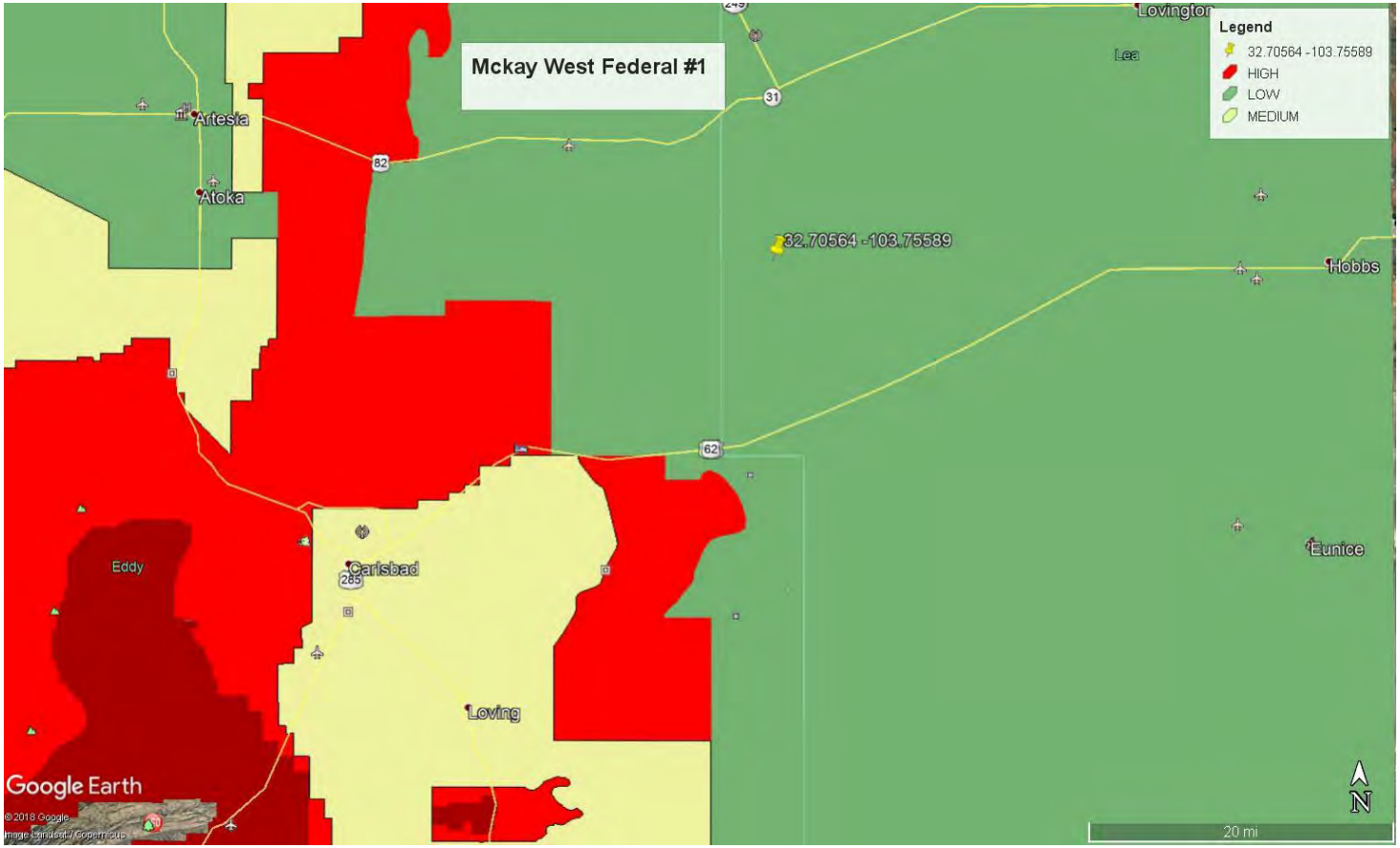
Table of data
Tab-separated data
Graph of data
Reselect period

Date	Time	Water-level date-time accuracy	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	Water-level accuracy	Status	Method of measurement	Measuring agency	Source of measurement	Water-level approval status
1965-12-08		D	117.42			2		U		U	A
1968-03-18		D	117.46			2		U		U	A
1971-04-06		D	117.46			2		U		U	A
1976-05-21		D	117.39			2		U		U	A
1981-03-12		D	117.28			2		U		U	A

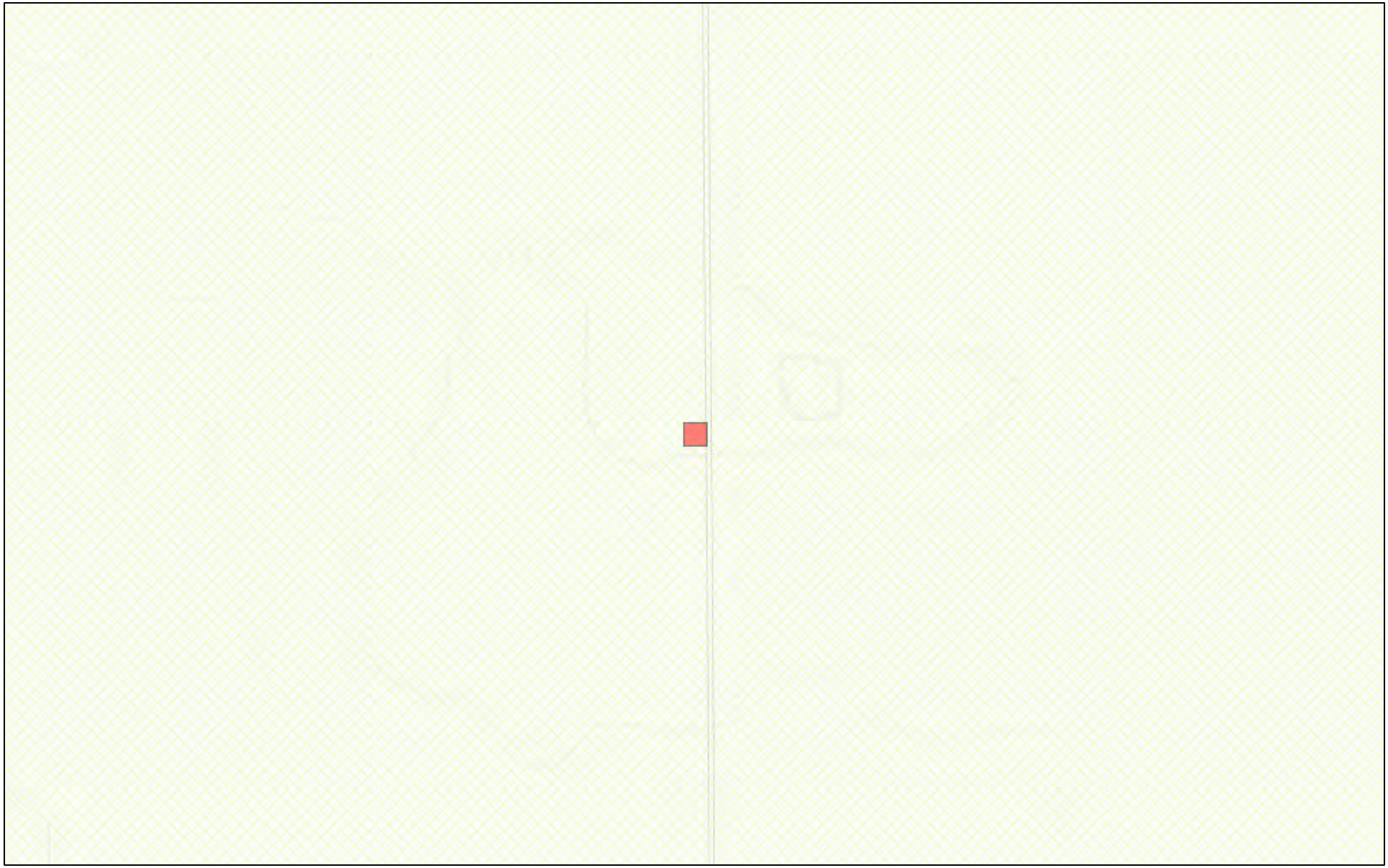
Section	Code	Description
Water-level date-time accuracy	D	Date is accurate to the Day
Water-level accuracy	2	Water level accuracy to nearest hundredth of a foot
Status		The reported water-level measurement represents a static level
Method of measurement	U	Unknown method.
Measuring agency		Not determined
Source of measurement	U	Source is unknown.
Water-level approval status	A	Approved for publication -- Processing and review completed.

Questions about sites/data?
Feedback on this web site

Data Tips
Explanation of terms


Mckay West Federal #1
Legend
32.70564 -103.75589
HIGH
LOW
MEDIUM
Artesia
Atoka
Lovington
Lea
Hobbs
32.70564 -103.75589
Eddy
Carlsbad
Loving
Eunice
Google Earth
20 mi
N

New Mexico NFHL Data



November 8, 2018

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

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

Appendix C

CARDINAL Laboratories

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

September 26, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MCKAY FED #1

Enclosed are the results of analyses for samples received by the laboratory on 09/25/18 16:35.

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 2 1' - 2.5' (H802709-01)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *94.4 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/26/2018	ND	432	108	400	3.64	

TPH 8015M mg/kg Analyzed By: MS **S-06**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<50.0	50.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**2410**	50.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**372**	50.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *94.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *179 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 2 2.5' - 3.5' (H802709-02)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *89.3 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/26/2018	ND	432	108	400	3.64	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**455**	10.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**59.2**	10.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *96.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *111 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 2 3.5' - 4.5' (H802709-03)

BTEX 8021B mg/kg **Analyzed By: ms**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *86.9 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/26/2018	ND	432	108	400	3.64	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**388**	10.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**71.0**	10.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *100 %* *41-142*

Surrogate: 1-Chlorooctadecane *109 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 2 4.5' - 5.5' (H802709-04)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *84.8 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/26/2018	ND	432	108	400	3.64	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	<10.0	10.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	<10.0	10.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *96.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *95.1 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

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

Analysis Request of Chain of Custody Record

Page _____ of _____

Tetra Tech, Inc.

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

Client Name: Marathon

Site Manager: Claico Gonzales

Project Name: McKAY FED #1

Project Location: (county, state) EDDY

Project #: 212C-MD-01183

Invoice to: TetRA Tech

Receiving Laboratory: Cardinal Labs

Sampler Signature: Ducky Moore

Comments: RP # 1RP-4759

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Sulfate	TDS	Chloride	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
H502709		YEAR:																															
1	Trench 2 1'-2.5'	9-25	11 00		X					1		X			X											X							
2	Trench 2 2.5'-3.5'	9-25	11 30		X					1		X			X											X							
3	Trench 2 3.5'-4.5'	9-25	12 00		X					1		X			X											X							
4	Trench 2 4.5'-5.5'	9-25	12:30		X					1		X			X											X							

ANALYSIS REQUEST (Circle or Specify Method No.)

Relinquished by: Ducky Moore Date: 9-25-18 Time: 4:37

Received by: Jodi Henson Date: 9/25/18 Time: 4:35

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

#97

Sample Temperature

13.2°C

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

clair.gonzales@tetratech.com
ducky.moore@tetratech.com

Samples taken + brought directly to lab. JA

CARDINAL Laboratories

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

September 26, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MCKAY FED #1

Enclosed are the results of analyses for samples received by the laboratory on 09/25/18 16:35.

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 1 1' - 2.5' (H802710-01)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	**0.055**	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	**0.817**	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	**0.873**	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	09/26/2018	ND	416	104	400	3.77	QM-07

TPH 8015M mg/kg Analyzed By: MS S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	**270**	50.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**5290**	50.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**879**	50.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *89.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *225 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 1 2.5' - 3.5' (H802710-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	**0.885**	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	**0.914**	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *185 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**224**	16.0	09/26/2018	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	**145**	50.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**4560**	50.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**866**	50.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *119 %* *41-142*

Surrogate: 1-Chlorooctadecane *245 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 1 3.5' - 4.5' (H802710-03)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/26/2018	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	**222**	50.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**6310**	50.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	**1090**	50.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *127 %* *41-142*

Surrogate: 1-Chlorooctadecane *299 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/25/2018	Sampling Date:	09/25/2018
Reported:	09/26/2018	Sampling Type:	Soil
Project Name:	MCKAY FED #1	Sampling Condition:	** (See Notes)
Project Number:	RP # 1RP - 4759	Sample Received By:	Jodi Henson
Project Location:			

Sample ID: TRENCH 1 4.5' - 5.5' (H802710-04)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/26/2018	ND	1.61	80.4	2.00	0.465	
Toluene*	<0.050	0.050	09/26/2018	ND	1.76	87.8	2.00	0.546	
Ethylbenzene*	<0.050	0.050	09/26/2018	ND	1.85	92.7	2.00	1.01	
Total Xylenes*	<0.150	0.150	09/26/2018	ND	5.58	93.0	6.00	1.28	
Total BTEX	<0.300	0.300	09/26/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *86.5 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/26/2018	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/26/2018	ND	186	92.9	200	4.69	
DRO >C10-C28*	**15.2**	10.0	09/26/2018	ND	173	86.7	200	5.78	
EXT DRO >C28-C36	<10.0	10.0	09/26/2018	ND					

Surrogate: 1-Chlorooctane *95.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *91.2 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

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

CARDINAL Laboratories

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

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

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

Analysis Request of Chain of Custody Record

Page _____ of _____

Tetra Tech, Inc.

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

Client Name: Marathon

Site Manager: Claire Gonzales

Project Name: McKay FED #1

Project Location: (county, state) EDDY

Project #: 212C-MD-01183

Invoice to: TetRA Tech

Receiving Laboratory: Cardinal Labs

Sampler Signature: Bucky Moore

Comments: RP # 1RP-4759

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)
H502709		YEAR:										
1	Trench 2 1'-2.5'	9-25	11 00		X						1	
2	Trench 2 2.5'-3.5'	9-25	11 30		X						1	
3	Trench 2 3.5'-4.5'	9-25	12 00		X						1	
4	Trench 2 4.5'-5.5'	9-25	12:30		X						1	

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
X		X												X							
X		X												X							
X		X												X							
X		X												X							

Relinquished by: Bucky Moore Date: 9-25-18 Time: 4:37

Received by: Jodi Henson Date: 9/25/18 Time: 4:35

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY #97 Sample Temperature 13.2°C

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

clair.gonzales@tetratech.com
bucky.moore@tetratech.com

Samples taken + brought directly to lab. JA

CARDINAL Laboratories

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

October 23, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MCKAY WEST FED #1

Enclosed are the results of analyses for samples received by the laboratory on 10/22/18 14:30.

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/22/2018	Sampling Date:	10/22/2018
Reported:	10/23/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH - 4A (H803030-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/22/2018	ND	1.99	99.3	2.00	2.00	
Toluene*	<0.050	0.050	10/22/2018	ND	1.92	95.9	2.00	0.368	
Ethylbenzene*	<0.050	0.050	10/22/2018	ND	1.94	97.1	2.00	1.19	
Total Xylenes*	<0.150	0.150	10/22/2018	ND	5.60	93.3	6.00	0.537	
Total BTEX	<0.300	0.300	10/22/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *108 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/23/2018	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/22/2018	ND	206	103	200	1.38	
DRO >C10-C28*	<10.0	10.0	10/22/2018	ND	225	113	200	0.700	
EXT DRO >C28-C36	<10.0	10.0	10/22/2018	ND					

Surrogate: 1-Chlorooctane *98.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *93.0 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Tetra Tech	**BILL TO**
Project Manager: Clair Gonzales	P.O. #:
Address: 901 W. Wall St.	Company: Tetra Tech
City: Midland State: TX Zip: 79701	Attn: Clair Gonzales
Phone #: 432-260-8634 Fax #:	Address: 901 W. Wall St.
Project #: 212C-MD-01183 Project Owner: Marathon	City: Midland
Project Name: McKay West Federal #1	State: TX Zip: 79701
Project Location: Lea Co., NM	Phone #: 432-260-8634
Sampler Name: Stephen Reyes	Fax #:

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	BTEX 8021B	TPH 8015M (GRO-DRO-ORO)	Chloride									
H803030																										
1	BH-4a		1			X					X		10/22/18		X	X	X									

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 10-22-18	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 14:30		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: Rush
	Time:		clair.gonzales@tetratech.com
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 5.0c #97	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) TO.	Stephen.reyes@tetratech.com

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

CARDINAL Laboratories

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

October 18, 2018

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MCKAY WEST FED #1

Enclosed are the results of analyses for samples received by the laboratory on 10/17/18 14:55.

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 1 (H802984-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/17/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/17/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/17/2018	ND					

Surrogate: 1-Chlorooctane *103 %* *41-142*

Surrogate: 1-Chlorooctadecane *98.7 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 2 (H802984-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *111 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/17/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/17/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/17/2018	ND					

Surrogate: 1-Chlorooctane *106 %* *41-142*

Surrogate: 1-Chlorooctadecane *103 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 3 (H802984-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/17/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/17/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/17/2018	ND					

Surrogate: 1-Chlorooctane *105 %* *41-142*

Surrogate: 1-Chlorooctadecane *102 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 4 (H802984-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	**0.149**	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	**0.236**	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	**0.385**	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *144 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**176**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	**17.2**	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	**1060**	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	**182**	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *113 %* *41-142*

Surrogate: 1-Chlorooctadecane *137 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 5 (H802984-05)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	**31.7**	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	**12.5**	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *107 %* *41-142*

Surrogate: 1-Chlorooctadecane *102 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 6 (H802984-06)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *102 %* *41-142*

Surrogate: 1-Chlorooctadecane *96.7 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 7 (H802984-07)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *115 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	**420**	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	**58.6**	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *99.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *109 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 8 (H802984-08)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *108 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *104 %* *41-142*

Surrogate: 1-Chlorooctadecane *104 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 9 (H802984-09)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *109 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *103 %* *41-142*

Surrogate: 1-Chlorooctadecane *103 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 10 (H802984-10)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *110 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *103 %* *41-142*

Surrogate: 1-Chlorooctadecane *102 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 11 (H802984-11)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *111 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *97.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *97.2 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: BH- 12 (H802984-12)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *115 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *104 %* *41-142*

Surrogate: 1-Chlorooctadecane *104 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: NORTH WALL (H802984-13)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *104 %* *41-142*

Surrogate: 1-Chlorooctadecane *105 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: EAST WALL (H802984-14)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *104 %* *41-142*

Surrogate: 1-Chlorooctadecane *106 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: SOUTH WALL (H802984-15)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/17/2018	ND	2.10	105	2.00	0.250	
Toluene*	<0.050	0.050	10/17/2018	ND	2.06	103	2.00	1.38	
Ethylbenzene*	<0.050	0.050	10/17/2018	ND	2.11	106	2.00	1.22	
Total Xylenes*	<0.150	0.150	10/17/2018	ND	6.07	101	6.00	1.07	
Total BTEX	<0.300	0.300	10/17/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *103 %* *41-142*

Surrogate: 1-Chlorooctadecane *102 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	10/17/2018	Sampling Date:	10/17/2018
Reported:	10/18/2018	Sampling Type:	Soil
Project Name:	MCKAY WEST FED #1	Sampling Condition:	Cool & Intact
Project Number:	212C-MC-01183	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

Sample ID: WEST WALL (H802984-16)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2018	ND	2.11	105	2.00	0.368	
Toluene*	<0.050	0.050	10/18/2018	ND	2.09	105	2.00	0.0329	
Ethylbenzene*	<0.050	0.050	10/18/2018	ND	2.15	107	2.00	0.186	
Total Xylenes*	<0.150	0.150	10/18/2018	ND	6.20	103	6.00	0.874	
Total BTEX	<0.300	0.300	10/18/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *110 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	10/18/2018	ND	448	112	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/18/2018	ND	198	99.1	200	2.88	
DRO >C10-C28*	<10.0	10.0	10/18/2018	ND	215	108	200	4.89	
EXT DRO >C28-C36	<10.0	10.0	10/18/2018	ND					

Surrogate: 1-Chlorooctane *99.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *101 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

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

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	Tetra Tech	**BILL TO**	
Project Manager:	Clair Gonzales	P.O. #:	
Address:	901 W. Wall St.	Company:	Tetra Tech
City:	Midland State: TX Zip: 79701	Attn:	Clair Gonzales
Phone #:	432-260-8634 Fax #:	Address:	901 W. Wall St.
Project #:	212C-MD-01183 Project Owner: Marathon Oil	City:	Midland
Project Name:	McKay West Federal #1	State:	TX Zip: 79701
Project Location:	Lea Co., NM	Phone #:	432-260-8634
Sampler Name:	Stephen Reyes	Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST		
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	BTEX 8260B / BTEX 8021B	TPH 8015M (GRO-DRO-MRO)	Chloride
1180298 4																	
1	BH-1		1			X					X		10/17/18		X	X	X
2	BH-2		1			X					X		10/17/18		X	X	X
3	BH-3		1			X					X		10/17/18		X	X	X
4	BH-4		1			X					X		10/17/18		X	X	X
5	BH-5		1			X					X		10/17/18		X	X	X
6	BH-6		1			X					X		10/17/18		X	X	X
7	BH-7		1			X					X		10/17/18		X	X	X
8	BH-8		1			X					X		10/17/18		X	X	X
9	BH-9		1			X					X		10/17/18		X	X	X
10	BH-10		1			X					X		10/17/18		X	X	X

Relinquished By:	Date: 10-17-18 Time: 14:55	Received By:	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	2.9c #97	Sample Condition Cool: Yes / Intact: Yes	CHECKED BY: (Initials) TC

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

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

2 of 2.

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	Tetra Tech
Project Manager:	Clair Gonzales
Address:	901 W. Wall St
City:	Midland State: TX Zip: 79701
Phone #:	432-260-8634 Fax #:
Project #:	212C-MD-01183 Project Owner: Marathon Oil
Project Name:	McKay West Federal #1
Project Location:	Lea Co., NM
Sampler Name:	Stephen Reyes

BILL TO

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

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	BTEX 8260 B (BTEX 8021 B)	TPH 8015 M (GRO-DRO-MRO)	Chloride
H802984																	
11	BH-11		1			X					X		10/17/18		X	X	X
12	BH-12		1			X					X		10/17/18		X	X	X
13	North Wall		1			X					X		10/17/18		X	X	X
14	East Wall		1			X					X		10/17/18		X	X	X
15	South Wall		1			X					X		10/17/18		X	X	X
16	West Wall		1			X					X		10/17/18		X	X	X

Relinquished By:	Date: 10-17-18 Time: 14:65	Received By:	Tamara Oldaker
Relinquished By:	Date: Time:	Received By:	

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: 2.9°C #497

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

CHECKED BY: (Initials) TO

Phone Result:	☐ Yes ☐ No	Add'l Phone #:	
Fax Result:	☐ Yes ☐ No	Add'l Fax #:	
REMARKS:		clair.gonzales@tetratech.com	

Rush

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

Analytical Report 602835

for

Tetra Tech- Midland

Project Manager: Clair Gonzales

McKay West Federal #1

212C-MD-01183 Task 300

19-OCT-18

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 (T104704219-18-17)
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)
Xenco-Lakeland: Florida (E84098)

19-OCT-18

Project Manager: **Clair Gonzales**
Tetra Tech- Midland
901 West Wall ST
Midland, TX 79701

Reference: XENCO Report No(s): **602835**
McKay West Federal #1
Project Address: Lea CO, NM

Clair Gonzales:

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) 602835. 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. 602835 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Jessica Kramer
Project Assistant

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

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

Sample Cross Reference 602835

Tetra Tech- Midland, Midland, TX

McKay West Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH #13 BEB (1.5')	S	10-18-18 00:00		602835-001
BH #14 BEB (1.5')	S	10-18-18 00:00		602835-002
BH #15	S	10-18-18 00:00		602835-003
BH #16	S	10-18-18 00:00		602835-004
BH #17	S	10-18-18 00:00		602835-005
North Side Wall (T2)	S	10-18-18 00:00		602835-006
South Side Wall (T2)	S	10-18-18 00:00		602835-007
West Side Wall 1 (T2)	S	10-18-18 00:00		602835-008
West Side Wall 2 (T2)	S	10-18-18 00:00		602835-009
East Side Wall 1 (T2)	S	10-18-18 00:00		602835-010
East Side Wall 2 (T2)	S	10-18-18 00:00		602835-011

CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: McKay West Federal #1

Project ID: *212C-MD-01183 Task 30(*
Work Order Number(s): *602835*

Report Date: *19-OCT-18*
Date Received: *10/18/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3066951 BTEX by EPA 8021B

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

Lab Sample ID 602835-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 602835-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011.

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

Certificate of Analysis Summary 602835

Tetra Tech- Midland, Midland, TX

Project Name: McKay West Federal #1

Project Id: 212C-MD-01183 Task 300
Contact: Clair Gonzales
Project Location: Lea CO, NM

Date Received in Lab: Thu Oct-18-18 04:25 pm
Report Date: 19-OCT-18
Project Manager: Jessica Kramer

Analysis Requested	*Lab Id:*	602835-001		602835-002		602835-003		602835-004		602835-005		602835-006	
	Field Id:	BH #13 BEB (1.5')		BH #14 BEB (1.5')		BH #15		BH #16		BH #17		North Side Wall (T2)	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00	
BTEX by EPA 8021B	*Extracted:*	Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45	
	Analyzed:	Oct-19-18 10:08		Oct-19-18 10:29		Oct-19-18 10:49		Oct-19-18 11:09		Oct-19-18 11:29		Oct-19-18 11:49	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
Toluene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
Ethylbenzene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
m,p-Xylenes		<0.00398	0.00398	<0.00399	0.00399	<0.00401	0.00401	<0.00403	0.00403	<0.00402	0.00402	<0.00398	0.00398
o-Xylene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
Total Xylenes		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
Total BTEX		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00199	0.00199
Inorganic Anions by EPA 300/300.1	*Extracted:*	Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30	
	Analyzed:	Oct-19-18 10:32		Oct-19-18 11:03		Oct-19-18 11:13		Oct-19-18 11:23		Oct-19-18 11:34		Oct-19-18 12:05	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		25.7	4.99	17.6	5.00	16.8	4.98	17.2	4.95	21.2	4.98	101	4.95
TPH By SW8015 Mod	*Extracted:*	Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00	
	Analyzed:	Oct-19-18 10:01		Oct-19-18 11:00		Oct-19-18 11:40		Oct-19-18 12:01		Oct-19-18 12:21		Oct-19-18 12:41	
	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	<15.0	15.0
Diesel Range Organics (DRO)		95.3	15.0	19.2	15.0	35.0	14.9	<15.0	15.0	113	15.0	<15.0	15.0
Motor Oil Range Hydrocarbons (MRO)		17.4	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	23.4	15.0	<15.0	15.0
Total TPH		113	15.0	19.2	15.0	35.0	14.9	<15.0	15.0	136	15.0	<15.0	15.0

Jessica Kramer
Project Assistant

Final 1.000

Certificate of Analysis Summary 602835

Tetra Tech- Midland, Midland, TX

Project Name: McKay West Federal #1

Project Id: 212C-MD-01183 Task 300
Contact: Clair Gonzales
Project Location: Lea CO, NM

Date Received in Lab: Thu Oct-18-18 04:25 pm
Report Date: 19-OCT-18
Project Manager: Jessica Kramer

Analysis Requested	*Lab Id:*	602835-007		602835-008		602835-009		602835-010		602835-011	
	Field Id:	South Side Wall (T2)		West Side Wall 1 (T2)		West Side Wall 2 (T2)		East Side Wall 1 (T2)		East Side Wall 2 (T2)	
	Depth:										
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00		Oct-18-18 00:00	
BTEX by EPA 8021B	*Extracted:*	Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45		Oct-19-18 07:45	
	Analyzed:	Oct-19-18 12:09		Oct-19-18 12:30		Oct-19-18 12:50		Oct-19-18 13:10		Oct-19-18 14:10	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
Toluene		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
Ethylbenzene		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
m,p-Xylenes		<0.00399	0.00399	<0.00402	0.00402	<0.00401	0.00401	<0.00398	0.00398	<0.00399	0.00399
o-Xylene		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
Total Xylenes		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
Total BTEX		<0.00200	0.00200	<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200
Inorganic Anions by EPA 300/300.1	*Extracted:*	Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30		Oct-19-18 09:30	
	Analyzed:	Oct-19-18 12:15		Oct-19-18 12:25		Oct-19-18 12:36		Oct-19-18 12:46		Oct-19-18 12:56	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		20.0	4.95	47.5	4.98	17.3	5.00	19.0	5.00	17.0	4.98
TPH By SW8015 Mod	*Extracted:*	Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00		Oct-19-18 07:00	
	Analyzed:	Oct-19-18 13:01		Oct-19-18 13:21		Oct-19-18 13:41		Oct-19-18 14:01		Oct-19-18 14:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Motor Oil Range Hydrocarbons (MRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Total TPH		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Jessica Kramer
Project Assistant

Final 1.000

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066947 **Sample:** 602835-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.0	99.8	90	70-135	
o-Terphenyl	49.0	49.9	98	70-135	

Lab Batch #: 3066951 **Sample:** 602835-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0377	0.0300	126	70-130	
4-Bromofluorobenzene	0.0330	0.0300	110	70-130	

Lab Batch #: 3066951 **Sample:** 602835-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0372	0.0300	124	70-130	
4-Bromofluorobenzene	0.0319	0.0300	106	70-130	

Lab Batch #: 3066951 **Sample:** 602835-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0373	0.0300	124	70-130	
4-Bromofluorobenzene	0.0357	0.0300	119	70-130	

Lab Batch #: 3066947 **Sample:** 602835-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 11:00

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.5	99.7	83	70-135	
o-Terphenyl	43.7	49.9	88	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066951 **Sample:** 602835-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 11:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0368	0.0300	123	70-130	
4-Bromofluorobenzene	0.0341	0.0300	114	70-130	

Lab Batch #: 3066951 **Sample:** 602835-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 11:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0370	0.0300	123	70-130	
4-Bromofluorobenzene	0.0324	0.0300	108	70-130	

Lab Batch #: 3066947 **Sample:** 602835-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 11:40

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	81.9	99.6	82	70-135	
o-Terphenyl	43.9	49.8	88	70-135	

Lab Batch #: 3066951 **Sample:** 602835-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 11:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0363	0.0300	121	70-130	
4-Bromofluorobenzene	0.0338	0.0300	113	70-130	

Lab Batch #: 3066947 **Sample:** 602835-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.1	99.8	80	70-135	
o-Terphenyl	41.8	49.9	84	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066951 **Sample:** 602835-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0365	0.0300	122	70-130	
4-Bromofluorobenzene	0.0353	0.0300	118	70-130	

Lab Batch #: 3066947 **Sample:** 602835-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.7	99.8	81	70-135	
o-Terphenyl	42.3	49.9	85	70-135	

Lab Batch #: 3066951 **Sample:** 602835-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0316	0.0300	105	70-130	
4-Bromofluorobenzene	0.0363	0.0300	121	70-130	

Lab Batch #: 3066947 **Sample:** 602835-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.4	99.8	80	70-135	
o-Terphenyl	40.8	49.9	82	70-135	

Lab Batch #: 3066951 **Sample:** 602835-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 12:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0364	0.0300	121	70-130	
4-Bromofluorobenzene	0.0362	0.0300	121	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066947 **Sample:** 602835-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 13:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	76.5	100	77	70-135	
o-Terphenyl	39.9	50.0	80	70-135	

Lab Batch #: 3066951 **Sample:** 602835-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 13:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0359	0.0300	120	70-130	
4-Bromofluorobenzene	0.0312	0.0300	104	70-130	

Lab Batch #: 3066947 **Sample:** 602835-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 13:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	71.7	99.9	72	70-135	
o-Terphenyl	36.7	50.0	73	70-135	

Lab Batch #: 3066947 **Sample:** 602835-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 13:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.1	100	79	70-135	
o-Terphenyl	41.6	50.0	83	70-135	

Lab Batch #: 3066947 **Sample:** 602835-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 14:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.7	99.7	83	70-135	
o-Terphenyl	42.5	49.9	85	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066951 **Sample:** 602835-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 14:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	70-130	
4-Bromofluorobenzene	0.0319	0.0300	106	70-130	

Lab Batch #: 3066947 **Sample:** 602835-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 14:59

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.1	99.7	86	70-135	
o-Terphenyl	45.5	49.9	91	70-135	

Lab Batch #: 3066947 **Sample:** 7664444-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 09:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.8	100	93	70-135	
o-Terphenyl	49.2	50.0	98	70-135	

Lab Batch #: 3066951 **Sample:** 7664502-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 09:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0357	0.0300	119	70-130	
4-Bromofluorobenzene	0.0305	0.0300	102	70-130	

Lab Batch #: 3066951 **Sample:** 7664502-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 08:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	70-130	
4-Bromofluorobenzene	0.0277	0.0300	92	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066947 **Sample:** 7664444-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 09:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	100	126	70-135	
o-Terphenyl	51.3	50.0	103	70-135	

Lab Batch #: 3066951 **Sample:** 7664502-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 08:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0278	0.0300	93	70-130	

Lab Batch #: 3066947 **Sample:** 7664444-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/19/18 09:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	100	127	70-135	
o-Terphenyl	51.6	50.0	103	70-135	

Lab Batch #: 3066951 **Sample:** 602835-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 08:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0328	0.0300	109	70-130	
4-Bromofluorobenzene	0.0311	0.0300	104	70-130	

Lab Batch #: 3066947 **Sample:** 602835-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:20

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	99.9	119	70-135	
o-Terphenyl	48.4	50.0	97	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: McKay West Federal #1

Work Orders : 602835,

Project ID: 212C-MD-01183 Task 300

Lab Batch #: 3066951 **Sample:** 602835-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 09:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	70-130	
4-Bromofluorobenzene	0.0288	0.0300	96	70-130	

Lab Batch #: 3066947 **Sample:** 602835-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/19/18 10:40

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	116	99.9	116	70-135	
o-Terphenyl	52.9	50.0	106	70-135	

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

BS / BSD Recoveries

Project Name: McKay West Federal #1

Work Order #: 602835 **Project ID:** 212C-MD-01183 Task 300

Analyst: ALJ **Date Prepared:** 10/19/2018 **Date Analyzed:** 10/19/2018

Lab Batch ID: 3066951 **Sample:** 7664502-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0973	97	0.100	0.0923	92	5	70-130	35	
Toluene	<0.00200	0.0998	0.0953	95	0.100	0.0906	91	5	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0933	93	0.100	0.0895	90	4	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.186	93	0.201	0.177	88	5	70-130	35	
o-Xylene	<0.00200	0.0998	0.0944	95	0.100	0.0892	89	6	70-130	35	

Analyst: SCM **Date Prepared:** 10/19/2018 **Date Analyzed:** 10/19/2018

Lab Batch ID: 3066959 **Sample:** 7664459-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	264	106	250	264	106	0	90-110	20	

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

BS / BSD Recoveries

Project Name: McKay West Federal #1

Work Order #: 602835 **Project ID:** 212C-MD-01183 Task 300

Analyst: ARM **Date Prepared:** 10/19/2018 **Date Analyzed:** 10/19/2018

Lab Batch ID: 3066947 **Sample:** 7664444-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	8.13	1000	932	93	1000	947	95	2	70-135	20	
Diesel Range Organics (DRO)	<8.13	1000	932	93	1000	948	95	2	70-135	20	

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

Form 3 - MS / MSD Recoveries

Project Name: McKay West Federal #1

Work Order # : 602835 **Project ID:** 212C-MD-01183 Task 300

Lab Batch ID: 3066951 **QC- Sample ID:** 602835-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/19/2018 **Date Prepared:** 10/19/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0697	70	0.101	0.0813	80	15	70-130	35	
Toluene	<0.00200	0.100	0.0612	61	0.101	0.0753	75	21	70-130	35	X
Ethylbenzene	<0.00200	0.100	0.0557	56	0.101	0.0716	71	25	70-130	35	X
m,p-Xylenes	<0.00401	0.200	0.109	55	0.201	0.140	70	25	70-130	35	X
o-Xylene	<0.00200	0.100	0.0540	54	0.101	0.0704	70	26	70-130	35	X

Lab Batch ID: 3066959 **QC- Sample ID:** 602835-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/19/2018 **Date Prepared:** 10/19/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	25.7	250	274	99	250	274	99	0	90-110	20	

Lab Batch ID: 3066959 **QC- Sample ID:** 602835-011 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/19/2018 **Date Prepared:** 10/19/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	17.0	249	244	91	249	244	91	0	90-110	20	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: McKay West Federal #1

Work Order # : 602835 **Project ID:** 212C-MD-01183 Task 300

Lab Batch ID: 3066947 **QC- Sample ID:** 602835-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/19/2018 **Date Prepared:** 10/19/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	13.5	999	917	90	999	901	89	2	70-135	20	
Diesel Range Organics (DRO)	95.3	999	975	88	999	952	86	2	70-135	20	

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

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

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

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

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

Analysis Request of Chain of Custody Record

Tetra Tech, Inc.

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

602835

Client Name: Marathon	**Site Manager:** Clair Gonzales
Project Name: McKay West Federal #1	
Project Location: (county, state) Lea CO, NM	**Project #:** 212C-MD-01183 Task 300
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco	**Sampler Signature:** Conner Moehring
Comments:	

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None		# CONTAINERS	FILTERED (Y/N)	BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	BH #13 BEB (1.5')	10/18/2018			X				X			1	N	X		X												X							
	BH #14 BEB (1.5')	10/18/2018			X				X			1	N	X		X												X							
	BH #15 BEB (1.5')	10/18/2018			X				X			1	N	X		X												X							
	BH #16 BEB (1.5')	10/18/2018			X				X			1	N	X		X												X							
	BH #17 BEB (1.5')	10/18/2018			X				X			1	N	X		X												X							
	North Side Wall (T2)	10/18/2018			X				X			1	N	X		X												X							
	South Side Wall (T2)	10/18/2018			X				X			1	N	X		X												X							
	West Side Wall 1 (T2)	10/18/2018			X				X			1	N	X		X												X							
	West Side Wall 2 (T2)	10/18/2018			X				X			1	N	X		X												X							
	East Side Wall 1 (T2)	10/18/2018			X				X			1	N	X		X												X							

ANALYSIS REQUEST
(Circle or Specify Method No.)

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Conner Moehring	10/18/18	1625	[signature]	10/18/18	1625
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY
Sample Temperature
2.4
R8/0.0

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

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

Analysis Request of Chain of Custody Record

Tetra Tech, Inc.

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

602835

Client Name: Marathon	**Site Manager:** Clair Gonzales
Project Name: McKay West Federal #1	
Project Location: (county, state) Lea CO, NM	**Project #:** 212C-MD-01183 Task 300
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco	**Sampler Signature:** Conner Moehring
Comments:	

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2018 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None	# CONTAINERS	FILTERED (Y/N)
	East Side Wall 2 (T2)	10/18/2018			X				X		1	N

ANALYSIS REQUEST
(Circle or Specify Method No.)

BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
X		X												X							

Relinquished by: Conner Moehring Date: 10/18/18 Time: 1625
Received by: [signature] Date: 10/18/18 Time: 1625

Relinquished by: Date: Time:
Received by: Date: Time:

Relinquished by: Date: Time:
Received by: Date: Time:

LAB USE ONLY
Sample Temperature 2.4
R80 Q

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

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 10/18/2018 04:25:00 PM

Work Order #: 602835

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

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.4
#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)?	**No**
#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: Katie Lowe Date: 10/18/2018

Checklist reviewed by: Jessica Kramer Date: 10/19/2018

Jessica Kramer

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

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

CONDITIONS

Action 218188

CONDITIONS

Operator: RAYBAW Operating, LLC 2626 Cole Avenue Dallas, TX 75204	OGRID: 330220
	Action Number: 218188
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	5/25/2023