



Pima Environmental Services, LLC
1601 N. Turner Ste 500
Hobbs, NM 88240
575-964-7740

Denied Completed C-141 not included with submittal

August 7, 2020

NMOCD District 2
Mr. Bradford Billings
811 S. First Street
Artesia, NM 88210

**Re: Work Plan Report
Emerald PWU 20 #1H
API No. 30-015-38338
GPS: Latitude 32.6525154 Longitude -104.1045456
UL "D", Sec. 20, T19S, R29E
Eddy County, NM
NMOCD Ref. No. 2RP-779; 2RP-4281; 2RP-5167; 2RP-5377**

Dear Mr. Billings,

Pima Environmental Services, LLC (Pima) has been contracted by Devon Energy Production Company (Devon) to perform a spill assessment and to submit a work plan for approved remediation activities on the open releases that occurred at the Emerald PWU 20 Fed #1H (Emerald). There are currently four open spills at this site. 2RP-779 release, the initial C-141, has been submitted and was assigned Incident ID nMLR1113050834, by the New Mexico Oil Conservation Division (NMOCD). 2RP-4281 release, the initial C-141 was submitted on June 29, 2017, and was assigned Incident ID nAB1718733399. A work plan was submitted and approved for this incident. The work plan will be followed as approved. The third release, 2RP-5167, the C-141, was submitted on November 20, 2018, and assigned Incident ID NAB1900959144. The fourth release, 2RP-5377, the initial C-141, was submitted on November 21, 2018, and assigned Incident ID NAB1912031219.

See Appendix C for all Initial C-141.

Site Characterization

The Emerald is located approximately eighteen (18) miles northeast of Carlsbad, NM. This spill site is in Unit D, Section 20, Township 19S, Range 29E, Latitude 32.6525154, Longitude -104.1045456, Eddy County, NM. Figure 1 references a location map.

Per the New Mexico Bureau of Geology and Mineral Resources, the geology is in the Quaternary Formation Eolian and piedmont deposits (Holocene to middle Pleistocene)-interlayered eolian sands and piedmont-slope deposits (QEP). The soil in this area is made up of Simona-Bippus complex, 0 to 5 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 well-drained. There is a high potential for karst geology to be present in the area of the Emerald (Figure 3).

According to the New Mexico Office of the State Engineer, depth to the nearest groundwater in this area is 150 feet below grade surface (BGS). According to the United States Geological Survey (USGS), the nearest groundwater is between 51-100 feet below grade surface (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
150'	20,000 mg/kg	2,500 mg/kg	1,000 mg/kg	50 mg/kg	10 mg/kg
<50	600 mg/kg	100 mg/kg	100 mg/kg	50 mg/kg	10mg/kg
If the release occurred within any of the following areas, the responsible party would treat the release as if the groundwater was less than 50 feet per Rule 19.15.29					
Water Issues				Yes	No
Within 300 feet of any continuously flowing watercourse or any other significant watercourse					x
Within 200 feet of any lakebed, sinkhole or playa lake (measures from the ordinary high-water mark)					x
Within 300 feet from an occupied permanent residence, school, hospital, institution or church					x
Within 500 feet of a spring or a private, domestic freshwater well used by less than five households for domestic or stock water purposes					x
Within 1000 feet of any freshwater well or spring					x
Within incorporated municipal boundaries or within a defined municipal freshwater well field					x
Within 300 feet of a wetlands					x
Within the area overlying a subsurface mine					x
Within an unstable area (Karst)				X	
Within a 100-year floodplain					x

Reference Figure 2 for a TOPO Map.

Release Information

2RP-779: On May 4, 2011, during the flowback process, the overnight watchman fell asleep and awoke to a frac tank overflowing. The released fluids were calculated to be approximately 23 barrels (bbls) of oil and 3 bbls of produced water. A vac truck was dispatched and was able to recover 22 bbls of fluids.

2RP-4281: On June 28, 2017, repairs were being made to the three-phase separator, gas, and sand cut the water dump resulting in a release of 0.5 bbls of oil and 4.5 bbls of produced water. The wells were shut-in, repairs were made to contain the leak. No fluids were recovered in this area.

2RP-5167: On November 10, 2018, a gasket failed on the heater treater resulting in a release of 20 bbls of oil and 10 bbls of produced water. The treater was isolated, and repairs were made. A vac truck was able to recover app 5 bbls of oil.

2RP-5377: On November 13, 2018, oil was found spraying out of the wellhead resulting in a release of 7 bbls of oil with no fluids being recovered.

Site Assessment and Soil Sampling Results

Another Environmental Service Company conducted a site assessment and soil sampling event for the 2RP-4281 spill. They submitted a work plan that was approved by the NMOCD. See attached Appendix E for the literature.

On July 7, 2020, Pima Environmental mobilized to the site to conduct a site assessment and obtain soil samples. Upon first look, there was no visual staining from any of the releases. We followed previously outlined diagrams and photos to track the vicinity of the spills and sampled in various random locations. The laboratory results of this sampling event can be found in the following data table.

7-7-20 Soil Sample Results

NMOCD Table 1 Closure Criteria 19.15.29 NMAC (Depth to Groundwater is >100')								
Sample Date 7-7-20		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
S-1	0-6	ND	ND	ND	ND	ND	ND	360
	1	ND	ND	ND	ND	ND	ND	160
S-2	0-6	ND	ND	ND	11000	8300	19300	3800
S-3	0-6	ND	ND	ND	11	ND	11	17000
S-4	0-6	ND	ND	ND	ND	ND	ND	570
	1	ND	ND	ND	ND	ND	ND	210
S-5	0-6	ND	ND	ND	ND	ND	ND	ND
	1	ND	ND	ND	ND	ND	ND	64
S-6	0-6	ND	ND	ND	ND	ND	ND	1200
S-7	0-6	ND	ND	ND	ND	ND	ND	ND
	1	ND	ND	ND	ND	ND	ND	ND
S-8	0-6	ND	ND	ND	ND	ND	ND	2300
	1	ND	ND	ND	ND	ND	ND	200
S-9	0-6	ND	ND	ND	20000	12000	32000	4100
	1	ND	ND	ND	240	190	430	430
S-10	0-6	ND	ND	ND	2700	3200	5900	2600
S-11	0-6	ND	ND	ND	3500	3600	7100	250
	1	ND	ND	ND	74	90	164	460

ND- Analyte Not Detected

Complete Laboratory Reports are attached in Appendix D.

Proposed Site Remediation

Pima proposes that the contaminated areas from the releases and from our sampling event that exceed NMAC Closure Criteria be remediated through excavation and removal using mechanical equipment and hand tools. The area in the vicinity of S-2 and S-3 be excavated to a depth of 1-foot BGS. The area in the vicinity of S-6, S-8, S-9, and S-10 will be to a depth of 1-foot BGS. The area in the vicinity of S-11 will be excavated to a depth of 2-feet BGS. Five-point composite bottom and sidewall composite samples will be obtained to ensure that the vertical and horizontal extents of the contamination had been removed. Each composite sample will be representative of no more than 200 square feet. Laboratory analysis will include Method SM-4500 for chlorides and Method 8015 for TPH, including MRO, DRO, and GRO. Upon laboratory results showing all samples meet the required closure criteria, the excavation will be backfilled with locally obtained clean like material and contoured to match the surrounding location.

Should you have any questions or need additional information, please feel free to contact Chris Jones at 575-964-7740 or chris@pimaoil.com.

Respectfully,



Chris Jones
Environmental Professional
Pima Environmental Services, LLC

Attachments

Figures:

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

Appendices:

- Appendix A- Referenced Water Surveys
- Appendix B- Soil Survey and Geological Data
- Appendix C- C-141's
- Appendix D- Laboratory Reports
- Appendix E- Approved Work Plan

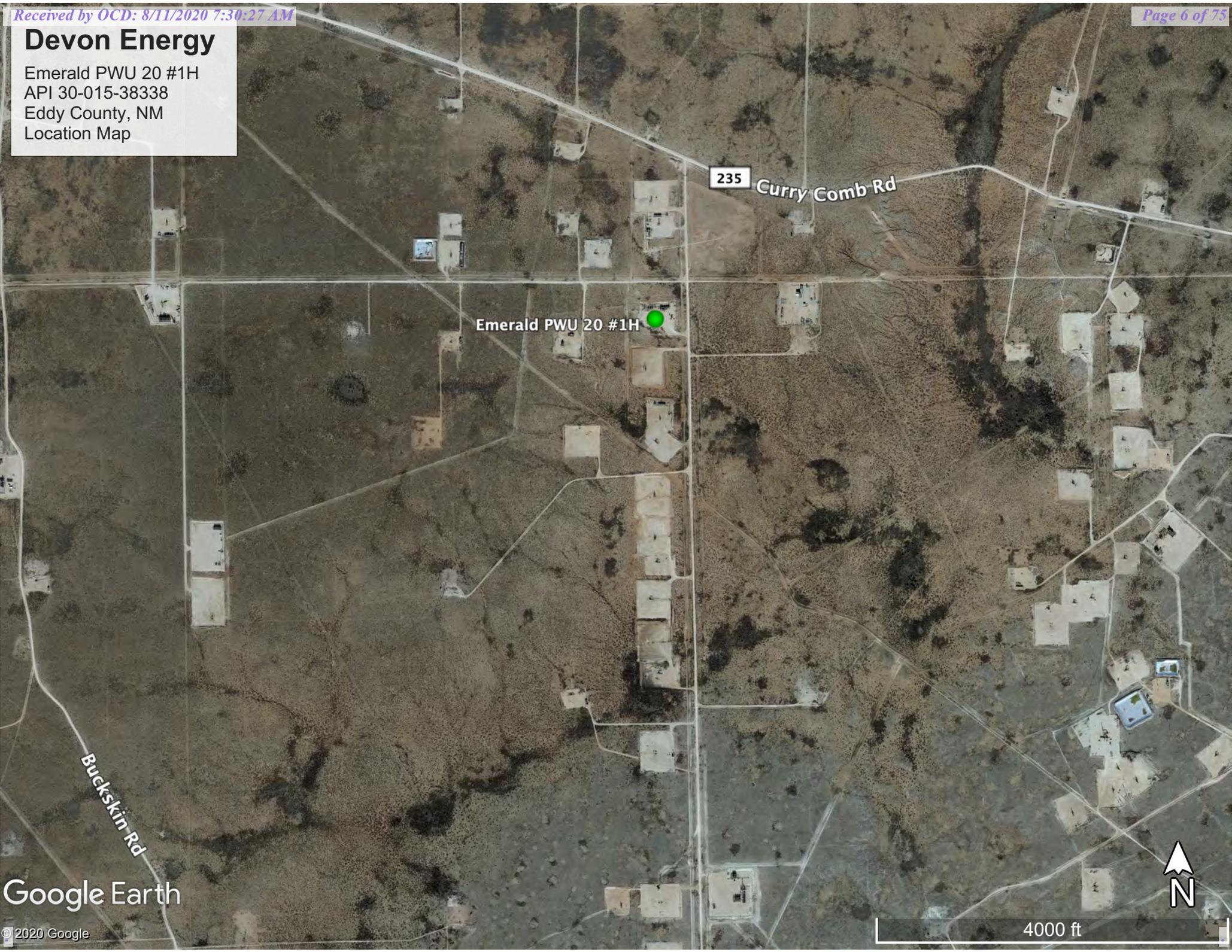


Pima Environmental Services

Figures:
1-Location Map
2- TOPO Map
3- Karst Map
4- Site Map

Devon Energy

Emerald PWU 20 #1H
API 30-015-38338
Eddy County, NM
Location Map



Emerald PWU 20 #1H

235 Curry Comb Rd

Buckskin Rd

Google Earth

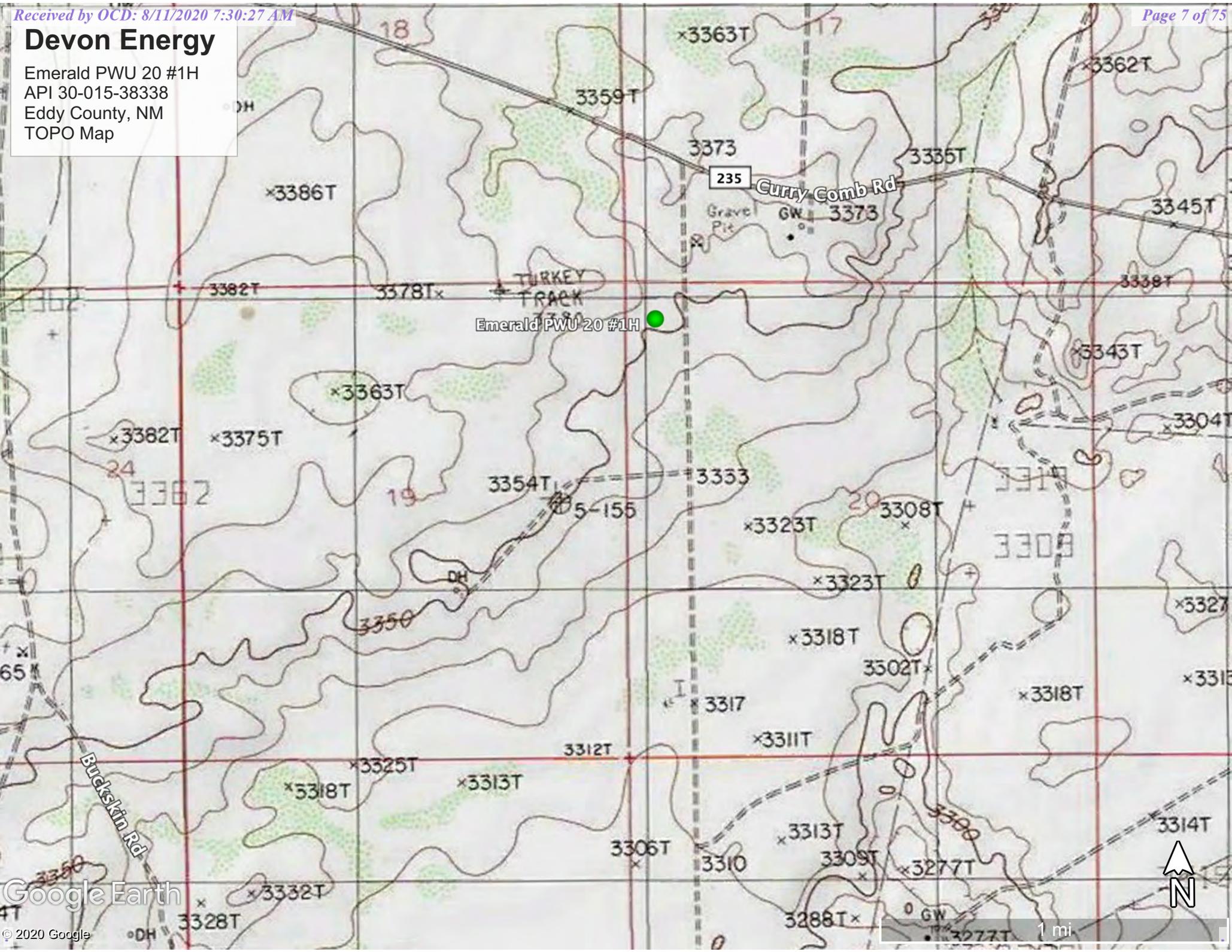
© 2020 Google



4000 ft

Devon Energy

Emerald PWU 20 #1H
API 30-015-38338
Eddy County, NM
TOPO Map



Devon Energy

Emerald PWU 20 #1H
API 30-015-38338
Eddy County, NM
Karst Map

Legend

- High
- Low
- Medium

Emerald PWU 20 #1H

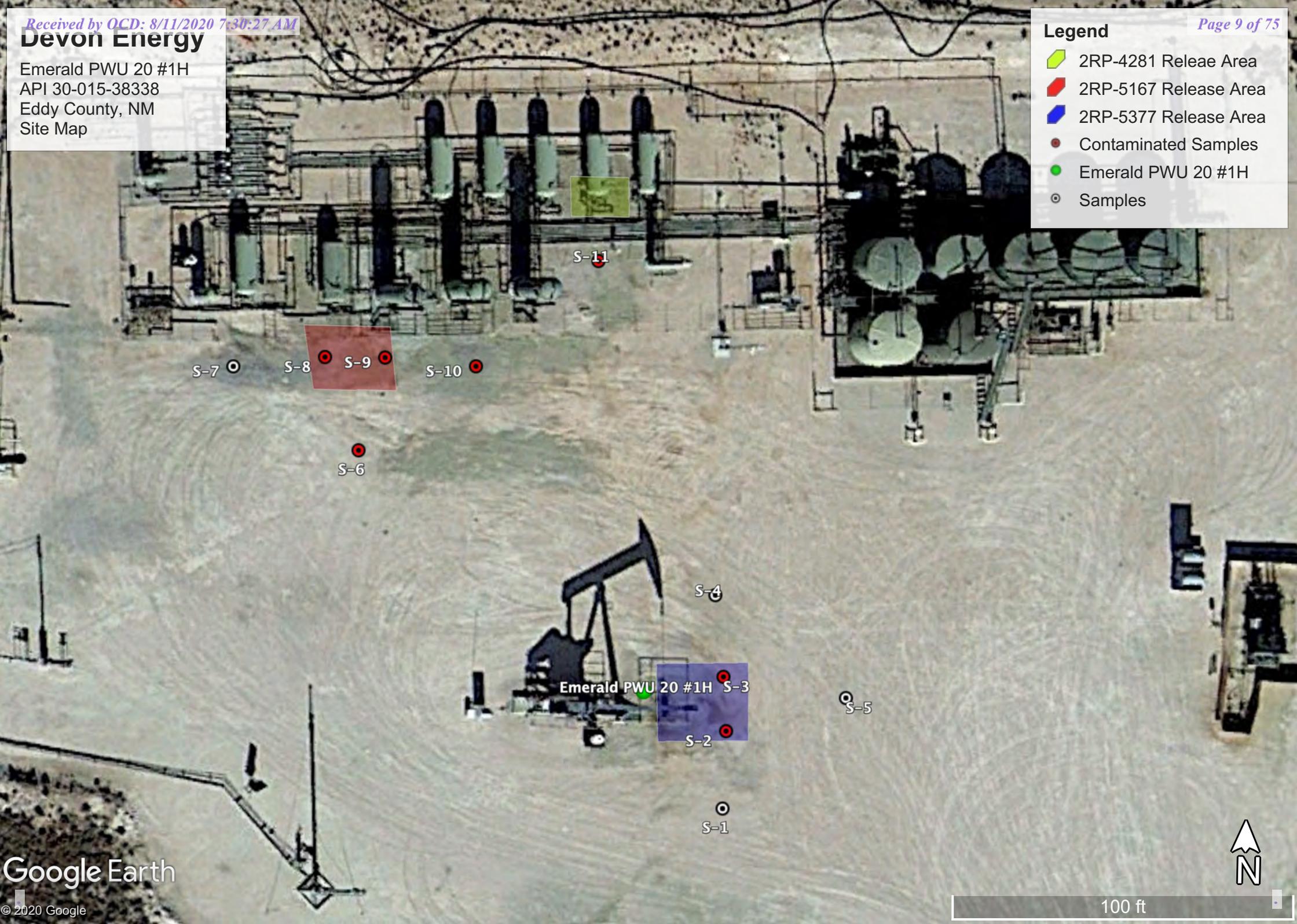


Devon Energy

Emerald PWU 20 #1H
API 30-015-38338
Eddy County, NM
Site Map

Legend

-  2RP-4281 Release Area
-  2RP-5167 Release Area
-  2RP-5377 Release Area
-  Contaminated Samples
-  Emerald PWU 20 #1H
-  Samples





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Appendix A
Water Surveys:
OSE
USGS



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	DepthWell	DepthWater	Water Column
CP00646		CP	ED	1	1	4	07	19S	29E	583155	3615551	2565	199	150	49

Average Depth to Water: **150 feet**
 Minimum Depth: **150 feet**
 Maximum Depth: **150 feet**

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 583977

Northing (Y): 3613121.615

Radius: 3000

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

6/9/20 11:34 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

National Water Information System: Mapper

Help Info

Sites Map

Search

Surface-Water Sites

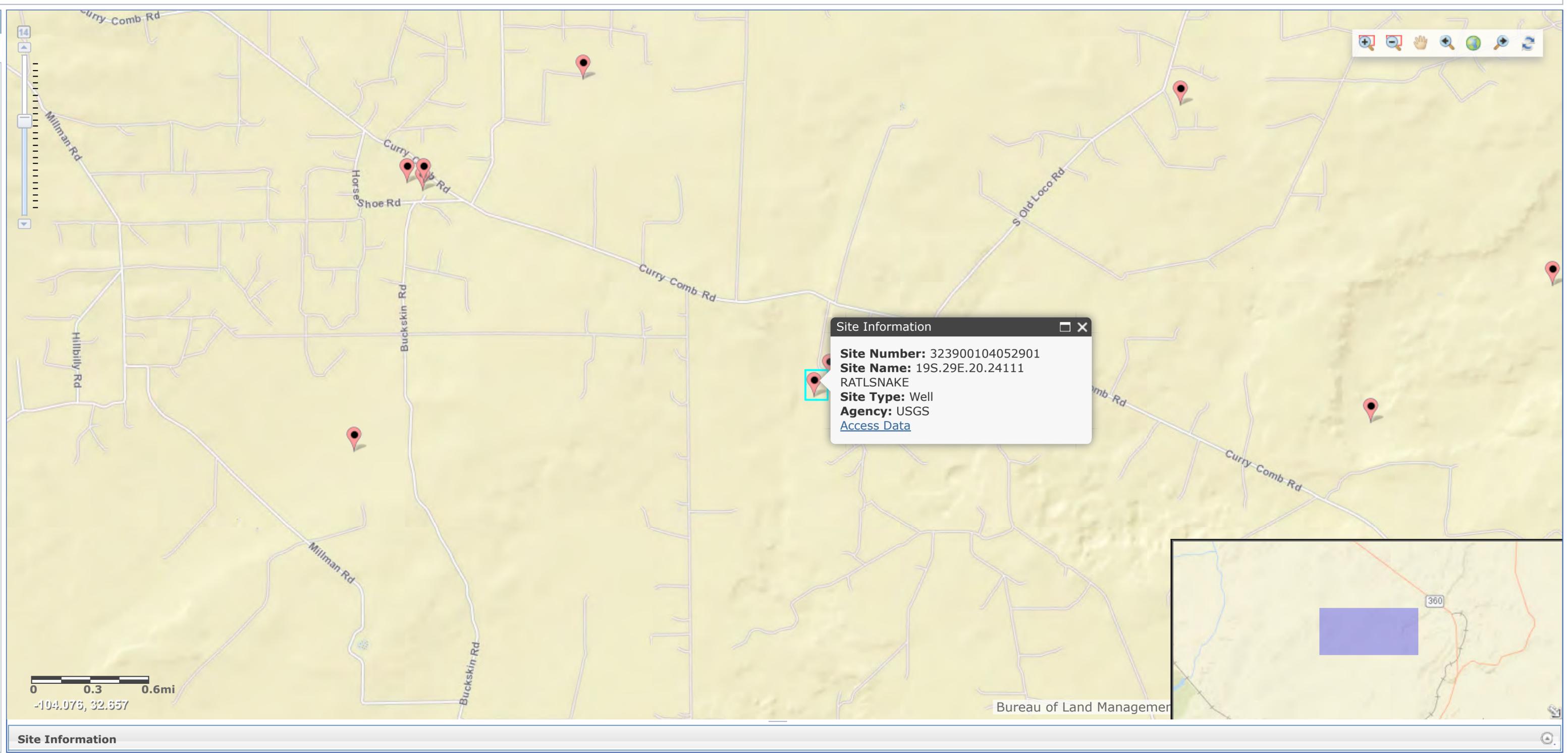
Groundwater Sites

- Active Sites
 - Any data
 - Instantaneous data
 - Daily data
 - Water-quality data
 - Measurements
 - Annual Report
- Inactive Sites
 - Any data
 - Instantaneous data
 - Daily data
 - Water-quality data
 - Measurements
 - Annual Report

Springs

Atmospheric Sites

Other Sites



Site Information

Click to hide News Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 323900104052901

Minimum number of levels = 1

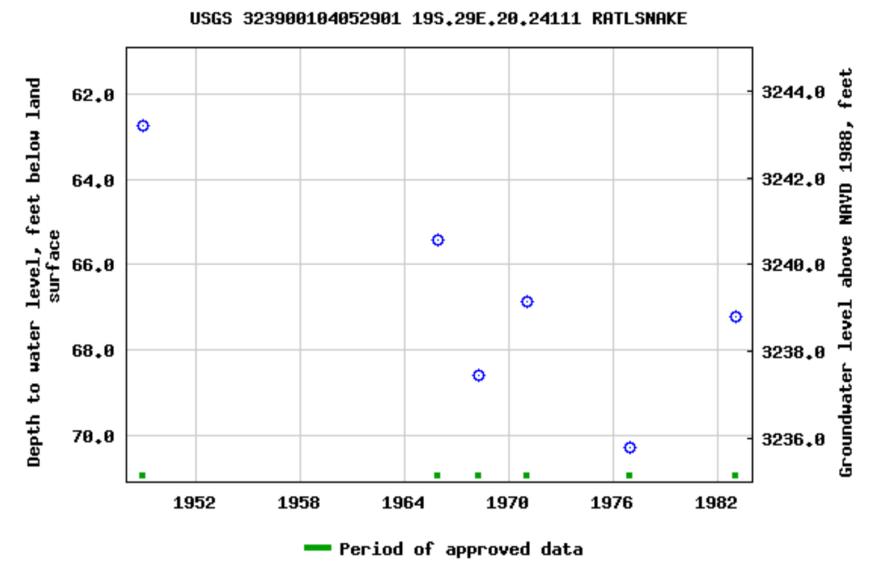
[Save file of selected sites](#) to local disk for future upload

USGS 323900104052901 19S.29E.20.24111 RATLSNAKE Available data for this site Groundwater: Field measurements GO

Eddy County, New Mexico
 Hydrologic Unit Code 13060011
 Latitude 32°39'00", Longitude 104°05'29" NAD27
 Land-surface elevation 3,306 feet above NAVD88
 This well is completed in the Rustler Formation (312RSLR) 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](#)
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Pima Environmental Services

Appendix B
Soil Survey & Geological Data:
USDA

Map Unit Description: Simona-Bippus complex, 0 to 5 percent slopes---Eddy Area, New Mexico

Eddy Area, New Mexico

SM—Simona-Bippus complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1w5x
Elevation: 1,800 to 5,000 feet
Mean annual precipitation: 8 to 24 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Simona and similar soils: 55 percent
Bippus and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Simona

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

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

Properties and qualities

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

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Map Unit Description: Simona-Bippus complex, 0 to 5 percent slopes---Eddy Area, New Mexico

Ecological site: Shallow Sandy (R042XC002NM)
Hydric soil rating: No

Description of Bippus

Setting

Landform: Flood plains, alluvial fans
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 37 inches: silty clay loam
H2 - 37 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very 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: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Bottomland (R042XC017NM)
Hydric soil rating: No

Minor Components

Simona

Percent of map unit: 8 percent
Ecological site: Shallow Sandy (R042XC002NM)
Hydric soil rating: No

Bippus

Percent of map unit: 7 percent
Ecological site: Bottomland (R042XC017NM)

Map Unit Description: Simona-Bippus complex, 0 to 5 percent slopes---Eddy Area, New Mexico

Hydric soil rating: No

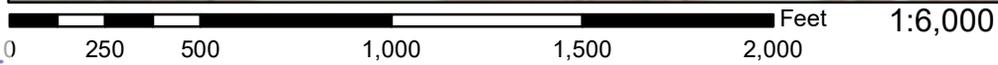
Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 15, Sep 15, 2019

National Flood Hazard Layer FIRMette



32°39'24.20"N



32°38'53.91"N

Legend

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

- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, V, A99
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway
 - OTHER AREAS OF FLOOD HAZARD**
 - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Reduced Flood Risk due to Levee. See Notes. Zone X
 - Area with Flood Risk due to Levee Zone D
 - OTHER AREAS**
 - NO SCREEN Area of Minimal Flood Hazard Zone X
 - Effective LOMRs
 - Area of Undetermined Flood Hazard Zone D
 - GENERAL STRUCTURES**
 - Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall
 - OTHER FEATURES**
 - Cross Sections with 1% Annual Chance Water Surface Elevation
 - Coastal Transect
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature
 - MAP PANELS**
 - Digital Data Available
 - No Digital Data Available
 - Unmapped
- 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 6/10/2020 at 1:40:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

104°6'35.09"W

104°5'57.63"W



Pima Environmental Services

Appendix C
C-141's:
Initial

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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 October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

Release Notification and Corrective Action

nMLB 1113050834

OPERATOR

Initial Report Final Report

Name of Company Devon Energy <i>6137</i>	Contact Roy White, Foreman
Address 6488 Seven Rivers Hwy – P.O. Box 250	Telephone No. 575-513-1741
Facility Name Emerald PWU 20 #1H 30-015-38338	Facility Type

Surface Owner	Mineral Owner	Lease No.
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	20	19S	29E	400	FNL	330	FWL	Eddy

Latitude _____ Longitude _____

NATURE OF RELEASE

Type of Release Oil & Produced Water	Volume of Release 23 bbls – Oil - 3 bbls - PW	Volume Recovered 20 bbls – Oil - 2 bbls - PW
Source of Release An overnight flow back hand fell asleep during his shift resulting in a frac tank to overflow and release 26 bbl of oil and produced water on the ground.	Date and Hour of Occurrence 05-04-11 - 6:22 am	Date and Hour of Discovery 05-04-11 - 06:22 am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mike Bratcher, NMOCD	
By Whom? Roy White, Foreman	Date and Hour 05-04-11 - 10:100 am	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		
Describe Cause of Problem and Remedial Action Taken.* <input type="checkbox"/> An overnight flow back hand fell asleep during his shift resulting in a frac tank to overflow and release 26 bbl of oil and produced water on the ground. Flow back hand had gauged the tank at 5:00 am before he fell asleep. Tank (500 bbl capacity) was at 6'5" at 5:00 am. Crew member woke up at 5:45 am and observed the 9' tall tank was overflowing. Crew member who fell asleep is no longer employed with the contract company. 22 bbl of the oil and produced water was recovered resulting in a 4 bbl spill		
Describe Area Affected and Cleanup Action Taken.* 100 yards in length x 25 width - Called vacuum truck Removed contaminated soil and replaced w/new soil.		

RECEIVED
MAY 10 2011
NMOCD ARTESIA

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

Signature: <i>Mykol Horner</i>	OIL CONSERVATION DIVISION	
Printed Name: Mykol Horner	Approved by District Supervisor Signed By <i>Mike Bratcher</i>	
Title: Field Tech 1	Approval Date: <i>5/10/2011</i>	Expiration Date:
E-mail Address: mykol.horner@dvn.com	Conditions of Approval: Remediation per OCD Rules & Guidelines. SUBMIT REMEDIATION	Attached <input type="checkbox"/>
Date: _____ Phone: 575-748-0160	PROPOSAL NOT LATER THAN: <i>6/10/2011</i>	

* Attach Additional Sheets If Necessary

2RP-779

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

NM OIL CONSERVATION

ARTESIA DISTRICT

Form C-141
Revised August 8, 2011

JUN 29 2017

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

RECEIVED

Release Notification and Corrective Action

NAB1718733399

OPERATOR

Initial Report Final Report

Name of Company Devon Energy Production Company	Contact Danny Velo, Production Foreman
Address 6488 Seven Rivers Hwy Artesia, NM 88210	Telephone No. 575-703-3360
Facility Name Emerald PWU 20 1H	Facility Type Oil

Surface Owner State	Mineral Owner State	API No 30-015-38338
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	20	19S	29E	400'	FNL	330'	FWL	Eddy

Latitude: 32.6525154

Longitude: -104.1045456

NATURE OF RELEASE

Type of Release Oil & Produced Water	Volume of Release .5bbls oil & 4.5bbls produced water	Volume Recovered 0bbls recovered
Source of Release Water dump on three-phase separator	Date and Hour of Occurrence June 28, 2017 @ 7:00 PM	Date and Hour of Discovery June 28, 2017 @ 7:00 PM
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Shelly Tucker, BLM Mike Bratcher, OCD	
By Whom? Jesse Armendariz, Asst. Production Foreman	Date and Hour Shelly Tucker, BLM June 28, 2017 @ 9:38 PM Mike Bratcher, OCD June 28, 2017 @ 9:40 PM	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse N/A	

If a Watercourse was Impacted, Describe Fully.*
N/A

Describe Cause of Problem and Remedial Action Taken.*
Three-phase separator was being bled down when gas and sand cut the water dump. The wells producing to the battery were shut in to stop the flow to the battery and then the water dump and three-phase separator were isolated.

Describe Area Affected and Cleanup Action Taken.*
Approximately .5bbls oil and 4.5bbls produced water were released on to location. All fluid remained on location and 0bbls were recovered. The affected area is approximately 13' x 12' on location. An environmental contractor will be contacted to assist with delineation and remediation

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

Signature: Sheila Fisher	OIL CONSERVATION DIVISION	
Printed Name: Sheila Fisher	Approved by Environmental Specialist: <i>Crystal W...</i>	
Title: Field Admin Support	Approval Date: 7/3/17	Expiration Date: N/A
E-mail Address: Sheila.fisher@dvn.com	Conditions of Approval: see attached	Attached: <input checked="" type="checkbox"/>
Date: 6/29/17	Phone: 575.748.1829	

* Attach Additional Sheets If Necessary

Please refer to the New Mexico Oil Conservation Division Website for updated form(s) at:

<http://www.emnrd.state.nm.us/>

Thank you

2RP-4281

Operator/Responsible Party,

The OCD has received the form C-141 you provided on **6/29/17** regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number ARP-4281 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 II office in Artesia on or before 7/29/17. 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; C₆ thru C₃₆), 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; C₆ thru C₃₆), 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

Weaver, Crystal, EMNRD

From: Fisher, Sheila <Sheila.Fisher@dvn.com>
Sent: Thursday, June 29, 2017 3:52 PM
To: Bratcher, Mike, EMNRD; Weaver, Crystal, EMNRD; Amber Groves (agroves@slo.state.nm.us)
Cc: Shoemaker, Mike; Fulks, Brett; Velo, Danny; Armendariz, Jesse; Scott, KY
Subject: Emerald PWU 20 1H_5bbls oil & 4.5bbls pw_6.28.17
Attachments: Emerald PWU 20 1H_5bbls oil & 4.5bbls pw_Initial C-141_6.28.17.doc; Emerald PWU 20 1H_5bbls oil & 4.5bbls pw_GIS Image_6.28.17.pdf

Good Afternoon,

Attached please find the Initial C-141 and GIS Image for the .5bbl oil & 4.5bbls produced water release at the Emerald PWU 20 1H on 6.28.17.

If you have any questions please feel free to contact me.

Thank you,

Sheila Fisher
Field Admin Support
Production
B-Schedule

Devon Energy Corporation
PO Box 250
Artesia, NM 88211
575 748 1829 Direct



Confidentiality Warning: This message and any attachments are intended only for the use of the intended recipient(s), are confidential, and may be privileged. If you are not the intended recipient, you are hereby notified that any review, retransmission, conversion to hard copy, copying, circulation or other use of all or any portion of this message and any attachments is strictly prohibited. If you are not the intended recipient, please notify the sender immediately by return e-mail, and delete this message and any attachments from your system.

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

State of New Mexico
 Energy Minerals and Natural
 Resources Department

Form C-141
 Revised August 24, 2018
 Submit to appropriate OCD District office

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

Incident ID	NAB1900959144
District RP	2RP-5167
Facility ID	
Application ID	pAB1900958601

Release Notification

Responsible Party

Responsible Party Devon Energy Production	OGRID 6137
Contact Name Amanda T. Davis	Contact Telephone 575-748-3371
Contact email amanda.davis@dvn.com	Incident # (assigned by OCD) NAB1900959144
Contact mailing address 6488 Seven Rivers Hwy	

Location of Release Source

Latitude 32.6525154 Longitude -104.1045456
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Emerald PWU 20 1H	Site Type Oil
Date Release Discovered 11/10/2018	API# (if applicable) 3001538338

Unit Letter	Section	Township	Range	County
D	20	19S	29E	Eddy

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

Nature and Volume of Release

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

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls) 20 BBLS	Volume Recovered (bbls) 10 BBLS
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls) 5 BBLS	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release **Gasket failed on the heater treater. Recovered 10 bbls. All stayed on the pad**

Received by OCD: 8/11/2020 7:30:27 AM

Incident ID	NAB1900959144
District RP	2RP-5167
Facility ID	
Application ID	pAB1900958601

Page 26 of 75

Was this a major release as defined by 19.15.29.7(A) NMAC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? This release is considered a major release because it is over the 25 BBLS.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

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

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

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

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

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

Printed Name: Kendra DeHoyos

Title: EHS Associate

Signature: Kendra DeHoyos
Digitally signed by Kendra DeHoyos
DN: cn=Kendra DeHoyos, o, ou,
email=kendra.dehoyos@dvn.com, c=US
Date: 2018.11.20 15:57:38 -0700

Date: 11/19/2018

email: kendra.dehoyos@dvn.com

Telephone: 575-748-3371

OCD Only

Received by: 

Date: 1/09/2019

Received by OCD: 8/11/2020 7:30:27 AM

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

State of New Mexico
Energy Minerals and Natural
Resources Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NAB1912031438
District RP	2RP-5377
Facility ID	
Application ID	pAB1912031219

Release Notification

Responsible Party

Responsible Party Devon Energy Production	OGRID 6137
Contact Name Amanda T. Davis	Contact Telephone 575-748-3371
Contact email amanda.davis@dvn.com	Incident # (assigned by OCD) NAB1912031438
Contact mailing address 6488 Seven Rivers Hwy	

Location of Release Source

Latitude 32.65251 Longitude -104.10455
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Emerald PWU 20 #001H	Site Type Oil
Date Release Discovered 11/13/2018	API# (if applicable) 30-015-38338

Unit Letter	Section	Township	Range	County
D	20	19S	29E	Eddy

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

Nature and Volume of Release

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

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls) 7 BBLS	Volume Recovered (bbls) 0 BBLS
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release Oil spraying out from wellhead. Affected area 18'X18'X8" around the well head.

State of New Mexico
Oil Conservation Division

Page 2

Incident ID	NAB1912031438
District RP	2RP-5377
Facility ID	
Application ID	pAB1912031219

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

Initial Response

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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.
If all the actions described above have <u>not</u> been undertaken, explain why: Wellhead not in containment
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.
Printed Name: <u>Kendra DeHoyos</u> Title: <u>EHS Associate</u> Signature: <u>Kendra DeHoyos</u> <small>Digitally signed by Kendra DeHoyos DN: cn=Kendra DeHoyos, o=oc, email=kendra.dehoyos@dvni.com, c=US Date: 2018.11.21 11:49:06 -0700'</small> Date: <u>11/21/2018</u> email: <u>kendra.dehoyos@dvni.com</u> Telephone: <u>575-748-3371</u>
OCD Only Received by: <u></u> Date: <u>4/30/2019</u>



Pima Environmental Services

Appendix D:
Laboratory Results



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

July 16, 2020

Chris Jones
Pima Environmental Services LLC
1601 N. Turner Ste 500
Hobbs, NM 88240
TEL: (575) 631-6977
FAX:

RE: Emerald PWU 20 1H

OrderNo.: 2007408

Dear Chris Jones:

Hall Environmental Analysis Laboratory received 18 sample(s) on 7/9/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S1, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:30:00 PM

Lab ID: 2007408-001

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	360	60		mg/Kg	20	7/11/2020 4:41:31 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	7/11/2020 9:45:27 PM	53614
Surr: BFB	93.5	70-130		%Rec	1	7/11/2020 9:45:27 PM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/11/2020 10:07:05 AM	53629
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/11/2020 10:07:05 AM	53629
Surr: DNOP	97.5	55.1-146		%Rec	1	7/11/2020 10:07:05 AM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/11/2020 9:45:27 PM	53614
Toluene	ND	0.046		mg/Kg	1	7/11/2020 9:45:27 PM	53614
Ethylbenzene	ND	0.046		mg/Kg	1	7/11/2020 9:45:27 PM	53614
Xylenes, Total	ND	0.092		mg/Kg	1	7/11/2020 9:45:27 PM	53614
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/11/2020 9:45:27 PM	53614
Surr: 4-Bromofluorobenzene	94.6	70-130		%Rec	1	7/11/2020 9:45:27 PM	53614
Surr: Dibromofluoromethane	112	70-130		%Rec	1	7/11/2020 9:45:27 PM	53614
Surr: Toluene-d8	101	70-130		%Rec	1	7/11/2020 9:45:27 PM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order 2007408

Date Reported: 7/16/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S1, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:35:00 PM

Lab ID: 2007408-002

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	160	60		mg/Kg	20	7/11/2020 4:53:56 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/11/2020 10:42:56 PM	53614
Surr: BFB	94.9	70-130		%Rec	1	7/11/2020 10:42:56 PM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/11/2020 11:20:31 AM	53629
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/11/2020 11:20:31 AM	53629
Surr: DNOP	56.7	55.1-146		%Rec	1	7/11/2020 11:20:31 AM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/11/2020 10:42:56 PM	53614
Toluene	ND	0.048		mg/Kg	1	7/11/2020 10:42:56 PM	53614
Ethylbenzene	ND	0.048		mg/Kg	1	7/11/2020 10:42:56 PM	53614
Xylenes, Total	ND	0.097		mg/Kg	1	7/11/2020 10:42:56 PM	53614
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	7/11/2020 10:42:56 PM	53614
Surr: 4-Bromofluorobenzene	96.4	70-130		%Rec	1	7/11/2020 10:42:56 PM	53614
Surr: Dibromofluoromethane	115	70-130		%Rec	1	7/11/2020 10:42:56 PM	53614
Surr: Toluene-d8	104	70-130		%Rec	1	7/11/2020 10:42:56 PM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order 2007408

Date Reported: 7/16/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S2, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:40:00 PM

Lab ID: 2007408-003

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	3800	150		mg/Kg	50	7/13/2020 3:54:10 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	23	D	mg/Kg	5	7/12/2020 2:04:49 AM	53614
Surr: BFB	93.1	70-130	D	%Rec	5	7/12/2020 2:04:49 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	11000	490		mg/Kg	50	7/11/2020 11:45:11 AM	53629
Motor Oil Range Organics (MRO)	8300	2500		mg/Kg	50	7/11/2020 11:45:11 AM	53629
Surr: DNOP	0	55.1-146	S	%Rec	50	7/11/2020 11:45:11 AM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.12	D	mg/Kg	5	7/12/2020 2:04:49 AM	53614
Toluene	ND	0.23	D	mg/Kg	5	7/12/2020 2:04:49 AM	53614
Ethylbenzene	ND	0.23	D	mg/Kg	5	7/12/2020 2:04:49 AM	53614
Xylenes, Total	ND	0.46	D	mg/Kg	5	7/12/2020 2:04:49 AM	53614
Surr: 1,2-Dichloroethane-d4	105	70-130	D	%Rec	5	7/12/2020 2:04:49 AM	53614
Surr: 4-Bromofluorobenzene	93.7	70-130	D	%Rec	5	7/12/2020 2:04:49 AM	53614
Surr: Dibromofluoromethane	109	70-130	D	%Rec	5	7/12/2020 2:04:49 AM	53614
Surr: Toluene-d8	102	70-130	D	%Rec	5	7/12/2020 2:04:49 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S3, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:45:00 PM

Lab ID: 2007408-004

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	17000	600		mg/Kg	200	7/13/2020 4:06:35 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 2:33:19 AM	53614
Surr: BFB	97.3	70-130		%Rec	1	7/12/2020 2:33:19 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	11	9.8		mg/Kg	1	7/11/2020 12:09:59 PM	53629
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/11/2020 12:09:59 PM	53629
Surr: DNOP	49.1	55.1-146	S	%Rec	1	7/11/2020 12:09:59 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 2:33:19 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 2:33:19 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 2:33:19 AM	53614
Xylenes, Total	ND	0.098		mg/Kg	1	7/12/2020 2:33:19 AM	53614
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	7/12/2020 2:33:19 AM	53614
Surr: 4-Bromofluorobenzene	97.3	70-130		%Rec	1	7/12/2020 2:33:19 AM	53614
Surr: Dibromofluoromethane	104	70-130		%Rec	1	7/12/2020 2:33:19 AM	53614
Surr: Toluene-d8	103	70-130		%Rec	1	7/12/2020 2:33:19 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix	

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S4, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:50:00 PM

Lab ID: 2007408-005

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	570	60		mg/Kg	20	7/11/2020 5:31:09 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/12/2020 3:01:50 AM	53614
Surr: BFB	96.1	70-130		%Rec	1	7/12/2020 3:01:50 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/11/2020 12:34:49 PM	53629
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/11/2020 12:34:49 PM	53629
Surr: DNOP	33.0	55.1-146	S	%Rec	1	7/11/2020 12:34:49 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 3:01:50 AM	53614
Toluene	ND	0.048		mg/Kg	1	7/12/2020 3:01:50 AM	53614
Ethylbenzene	ND	0.048		mg/Kg	1	7/12/2020 3:01:50 AM	53614
Xylenes, Total	ND	0.096		mg/Kg	1	7/12/2020 3:01:50 AM	53614
Surr: 1,2-Dichloroethane-d4	113	70-130		%Rec	1	7/12/2020 3:01:50 AM	53614
Surr: 4-Bromofluorobenzene	96.5	70-130		%Rec	1	7/12/2020 3:01:50 AM	53614
Surr: Dibromofluoromethane	112	70-130		%Rec	1	7/12/2020 3:01:50 AM	53614
Surr: Toluene-d8	102	70-130		%Rec	1	7/12/2020 3:01:50 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order 2007408

Date Reported: 7/16/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S4, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 3:55:00 PM

Lab ID: 2007408-006

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	210	60		mg/Kg	20	7/11/2020 5:43:33 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/12/2020 3:30:36 AM	53614
Surr: BFB	96.4	70-130		%Rec	1	7/12/2020 3:30:36 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/11/2020 12:59:50 PM	53629
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/11/2020 12:59:50 PM	53629
Surr: DNOP	44.3	55.1-146	S	%Rec	1	7/11/2020 12:59:50 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/12/2020 3:30:36 AM	53614
Toluene	ND	0.050		mg/Kg	1	7/12/2020 3:30:36 AM	53614
Ethylbenzene	ND	0.050		mg/Kg	1	7/12/2020 3:30:36 AM	53614
Xylenes, Total	ND	0.10		mg/Kg	1	7/12/2020 3:30:36 AM	53614
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	7/12/2020 3:30:36 AM	53614
Surr: 4-Bromofluorobenzene	95.1	70-130		%Rec	1	7/12/2020 3:30:36 AM	53614
Surr: Dibromofluoromethane	108	70-130		%Rec	1	7/12/2020 3:30:36 AM	53614
Surr: Toluene-d8	104	70-130		%Rec	1	7/12/2020 3:30:36 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S5, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:00:00 PM

Lab ID: 2007408-007

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	ND	60		mg/Kg	20	7/11/2020 5:55:57 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/12/2020 3:59:11 AM	53614
Surr: BFB	94.2	70-130		%Rec	1	7/12/2020 3:59:11 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	7/11/2020 1:24:53 PM	53629
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	7/11/2020 1:24:53 PM	53629
Surr: DNOP	29.7	55.1-146	S	%Rec	1	7/11/2020 1:24:53 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 3:59:11 AM	53614
Toluene	ND	0.048		mg/Kg	1	7/12/2020 3:59:11 AM	53614
Ethylbenzene	ND	0.048		mg/Kg	1	7/12/2020 3:59:11 AM	53614
Xylenes, Total	ND	0.095		mg/Kg	1	7/12/2020 3:59:11 AM	53614
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	7/12/2020 3:59:11 AM	53614
Surr: 4-Bromofluorobenzene	92.0	70-130		%Rec	1	7/12/2020 3:59:11 AM	53614
Surr: Dibromofluoromethane	109	70-130		%Rec	1	7/12/2020 3:59:11 AM	53614
Surr: Toluene-d8	102	70-130		%Rec	1	7/12/2020 3:59:11 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S5, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:05:00 PM

Lab ID: 2007408-008

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	64	60		mg/Kg	20	7/11/2020 6:08:22 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 4:27:38 AM	53614
Surr: BFB	96.4	70-130		%Rec	1	7/12/2020 4:27:38 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/11/2020 1:49:46 PM	53629
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/11/2020 1:49:46 PM	53629
Surr: DNOP	47.2	55.1-146	S	%Rec	1	7/11/2020 1:49:46 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/12/2020 4:27:38 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 4:27:38 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 4:27:38 AM	53614
Xylenes, Total	ND	0.099		mg/Kg	1	7/12/2020 4:27:38 AM	53614
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	7/12/2020 4:27:38 AM	53614
Surr: 4-Bromofluorobenzene	93.1	70-130		%Rec	1	7/12/2020 4:27:38 AM	53614
Surr: Dibromofluoromethane	110	70-130		%Rec	1	7/12/2020 4:27:38 AM	53614
Surr: Toluene-d8	105	70-130		%Rec	1	7/12/2020 4:27:38 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S6, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:10:00 PM

Lab ID: 2007408-009

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	1200	60		mg/Kg	20	7/11/2020 6:45:34 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 4:56:06 AM	53614
Surr: BFB	94.2	70-130		%Rec	1	7/12/2020 4:56:06 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	7/11/2020 2:14:39 PM	53629
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/11/2020 2:14:39 PM	53629
Surr: DNOP	30.9	55.1-146	S	%Rec	1	7/11/2020 2:14:39 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/12/2020 4:56:06 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 4:56:06 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 4:56:06 AM	53614
Xylenes, Total	ND	0.098		mg/Kg	1	7/12/2020 4:56:06 AM	53614
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/12/2020 4:56:06 AM	53614
Surr: 4-Bromofluorobenzene	94.8	70-130		%Rec	1	7/12/2020 4:56:06 AM	53614
Surr: Dibromofluoromethane	104	70-130		%Rec	1	7/12/2020 4:56:06 AM	53614
Surr: Toluene-d8	102	70-130		%Rec	1	7/12/2020 4:56:06 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S7, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:15:00 PM

Lab ID: 2007408-010

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	ND	60		mg/Kg	20	7/11/2020 6:57:58 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/12/2020 5:25:03 AM	53614
Surr: BFB	92.3	70-130		%Rec	1	7/12/2020 5:25:03 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/11/2020 2:39:45 PM	53629
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/11/2020 2:39:45 PM	53629
Surr: DNOP	44.4	55.1-146	S	%Rec	1	7/11/2020 2:39:45 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 5:25:03 AM	53614
Toluene	ND	0.047		mg/Kg	1	7/12/2020 5:25:03 AM	53614
Ethylbenzene	ND	0.047		mg/Kg	1	7/12/2020 5:25:03 AM	53614
Xylenes, Total	ND	0.095		mg/Kg	1	7/12/2020 5:25:03 AM	53614
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/12/2020 5:25:03 AM	53614
Surr: 4-Bromofluorobenzene	92.3	70-130		%Rec	1	7/12/2020 5:25:03 AM	53614
Surr: Dibromofluoromethane	115	70-130		%Rec	1	7/12/2020 5:25:03 AM	53614
Surr: Toluene-d8	99.0	70-130		%Rec	1	7/12/2020 5:25:03 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S7, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:20:00 PM

Lab ID: 2007408-011

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	ND	60		mg/Kg	20	7/11/2020 7:10:22 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 5:53:47 AM	53614
Surr: BFB	94.8	70-130		%Rec	1	7/12/2020 5:53:47 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	7/11/2020 3:04:50 PM	53629
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/11/2020 3:04:50 PM	53629
Surr: DNOP	71.9	55.1-146		%Rec	1	7/11/2020 3:04:50 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/12/2020 5:53:47 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 5:53:47 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 5:53:47 AM	53614
Xylenes, Total	ND	0.099		mg/Kg	1	7/12/2020 5:53:47 AM	53614
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	7/12/2020 5:53:47 AM	53614
Surr: 4-Bromofluorobenzene	98.0	70-130		%Rec	1	7/12/2020 5:53:47 AM	53614
Surr: Dibromofluoromethane	114	70-130		%Rec	1	7/12/2020 5:53:47 AM	53614
Surr: Toluene-d8	101	70-130		%Rec	1	7/12/2020 5:53:47 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S8, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:25:00 PM

Lab ID: 2007408-012

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	2300	60		mg/Kg	20	7/11/2020 7:22:47 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/12/2020 6:22:15 AM	53614
Surr: BFB	95.8	70-130		%Rec	1	7/12/2020 6:22:15 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	7/11/2020 3:54:54 PM	53629
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	7/11/2020 3:54:54 PM	53629
Surr: DNOP	57.8	55.1-146		%Rec	1	7/11/2020 3:54:54 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 6:22:15 AM	53614
Toluene	ND	0.048		mg/Kg	1	7/12/2020 6:22:15 AM	53614
Ethylbenzene	ND	0.048		mg/Kg	1	7/12/2020 6:22:15 AM	53614
Xylenes, Total	ND	0.096		mg/Kg	1	7/12/2020 6:22:15 AM	53614
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	7/12/2020 6:22:15 AM	53614
Surr: 4-Bromofluorobenzene	93.9	70-130		%Rec	1	7/12/2020 6:22:15 AM	53614
Surr: Dibromofluoromethane	105	70-130		%Rec	1	7/12/2020 6:22:15 AM	53614
Surr: Toluene-d8	106	70-130		%Rec	1	7/12/2020 6:22:15 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S8, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:30:00 PM

Lab ID: 2007408-013

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	200	61		mg/Kg	20	7/11/2020 7:35:12 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 6:50:45 AM	53614
Surr: BFB	95.3	70-130		%Rec	1	7/12/2020 6:50:45 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/11/2020 4:19:36 PM	53629
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/11/2020 4:19:36 PM	53629
Surr: DNOP	86.4	55.1-146		%Rec	1	7/11/2020 4:19:36 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/12/2020 6:50:45 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 6:50:45 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 6:50:45 AM	53614
Xylenes, Total	ND	0.098		mg/Kg	1	7/12/2020 6:50:45 AM	53614
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	7/12/2020 6:50:45 AM	53614
Surr: 4-Bromofluorobenzene	93.1	70-130		%Rec	1	7/12/2020 6:50:45 AM	53614
Surr: Dibromofluoromethane	106	70-130		%Rec	1	7/12/2020 6:50:45 AM	53614
Surr: Toluene-d8	104	70-130		%Rec	1	7/12/2020 6:50:45 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S9, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:35:00 PM

Lab ID: 2007408-014

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	4100	150		mg/Kg	50	7/13/2020 4:18:59 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	25	D	mg/Kg	5	7/12/2020 7:19:14 AM	53614
Surr: BFB	96.4	70-130	D	%Rec	5	7/12/2020 7:19:14 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	20000	490		mg/Kg	50	7/11/2020 4:44:23 PM	53629
Motor Oil Range Organics (MRO)	12000	2500		mg/Kg	50	7/11/2020 4:44:23 PM	53629
Surr: DNOP	0	55.1-146	S	%Rec	50	7/11/2020 4:44:23 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.12	D	mg/Kg	5	7/12/2020 7:19:14 AM	53614
Toluene	ND	0.25	D	mg/Kg	5	7/12/2020 7:19:14 AM	53614
Ethylbenzene	ND	0.25	D	mg/Kg	5	7/12/2020 7:19:14 AM	53614
Xylenes, Total	ND	0.49	D	mg/Kg	5	7/12/2020 7:19:14 AM	53614
Surr: 1,2-Dichloroethane-d4	104	70-130	D	%Rec	5	7/12/2020 7:19:14 AM	53614
Surr: 4-Bromofluorobenzene	73.9	70-130	D	%Rec	5	7/12/2020 7:19:14 AM	53614
Surr: Dibromofluoromethane	106	70-130	D	%Rec	5	7/12/2020 7:19:14 AM	53614
Surr: Toluene-d8	104	70-130	D	%Rec	5	7/12/2020 7:19:14 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S9,1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:40:00 PM

Lab ID: 2007408-015

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CJS
Chloride	430	59		mg/Kg	20	7/11/2020 8:00:00 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/12/2020 7:47:47 AM	53614
Surr: BFB	92.4	70-130		%Rec	1	7/12/2020 7:47:47 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	240	9.8		mg/Kg	1	7/11/2020 5:09:07 PM	53629
Motor Oil Range Organics (MRO)	190	49		mg/Kg	1	7/11/2020 5:09:07 PM	53629
Surr: DNOP	112	55.1-146		%Rec	1	7/11/2020 5:09:07 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 7:47:47 AM	53614
Toluene	ND	0.049		mg/Kg	1	7/12/2020 7:47:47 AM	53614
Ethylbenzene	ND	0.049		mg/Kg	1	7/12/2020 7:47:47 AM	53614
Xylenes, Total	ND	0.098		mg/Kg	1	7/12/2020 7:47:47 AM	53614
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	7/12/2020 7:47:47 AM	53614
Surr: 4-Bromofluorobenzene	92.1	70-130		%Rec	1	7/12/2020 7:47:47 AM	53614
Surr: Dibromofluoromethane	106	70-130		%Rec	1	7/12/2020 7:47:47 AM	53614
Surr: Toluene-d8	101	70-130		%Rec	1	7/12/2020 7:47:47 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S10, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:45:00 PM

Lab ID: 2007408-016

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	2600	150		mg/Kg	50	7/13/2020 4:31:23 PM	53651
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	23	D	mg/Kg	5	7/12/2020 8:16:16 AM	53614
Surr: BFB	95.2	70-130	D	%Rec	5	7/12/2020 8:16:16 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	2700	190		mg/Kg	20	7/11/2020 5:34:21 PM	53629
Motor Oil Range Organics (MRO)	3200	930		mg/Kg	20	7/11/2020 5:34:21 PM	53629
Surr: DNOP	0	55.1-146	S	%Rec	20	7/11/2020 5:34:21 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.12	D	mg/Kg	5	7/12/2020 8:16:16 AM	53614
Toluene	ND	0.23	D	mg/Kg	5	7/12/2020 8:16:16 AM	53614
Ethylbenzene	ND	0.23	D	mg/Kg	5	7/12/2020 8:16:16 AM	53614
Xylenes, Total	ND	0.47	D	mg/Kg	5	7/12/2020 8:16:16 AM	53614
Surr: 1,2-Dichloroethane-d4	107	70-130	D	%Rec	5	7/12/2020 8:16:16 AM	53614
Surr: 4-Bromofluorobenzene	95.7	70-130	D	%Rec	5	7/12/2020 8:16:16 AM	53614
Surr: Dibromofluoromethane	113	70-130	D	%Rec	5	7/12/2020 8:16:16 AM	53614
Surr: Toluene-d8	103	70-130	D	%Rec	5	7/12/2020 8:16:16 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order 2007408

Date Reported: 7/16/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S11, 0"-6"

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:50:00 PM

Lab ID: 2007408-017

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	250	60		mg/Kg	20	7/13/2020 11:46:02 AM	53665
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	24	D	mg/Kg	5	7/12/2020 8:44:46 AM	53614
Surr: BFB	95.7	70-130	D	%Rec	5	7/12/2020 8:44:46 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	3500	98		mg/Kg	10	7/11/2020 5:59:39 PM	53629
Motor Oil Range Organics (MRO)	3600	490		mg/Kg	10	7/11/2020 5:59:39 PM	53629
Surr: DNOP	0	55.1-146	S	%Rec	10	7/11/2020 5:59:39 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.12	D	mg/Kg	5	7/12/2020 8:44:46 AM	53614
Toluene	ND	0.24	D	mg/Kg	5	7/12/2020 8:44:46 AM	53614
Ethylbenzene	ND	0.24	D	mg/Kg	5	7/12/2020 8:44:46 AM	53614
Xylenes, Total	ND	0.49	D	mg/Kg	5	7/12/2020 8:44:46 AM	53614
Surr: 1,2-Dichloroethane-d4	103	70-130	D	%Rec	5	7/12/2020 8:44:46 AM	53614
Surr: 4-Bromofluorobenzene	90.5	70-130	D	%Rec	5	7/12/2020 8:44:46 AM	53614
Surr: Dibromofluoromethane	104	70-130	D	%Rec	5	7/12/2020 8:44:46 AM	53614
Surr: Toluene-d8	106	70-130	D	%Rec	5	7/12/2020 8:44:46 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order **2007408**

Date Reported: **7/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Pima Environmental Services LLC

Client Sample ID: S11, 1'

Project: Emerald PWU 20 1H

Collection Date: 7/7/2020 4:55:00 PM

Lab ID: 2007408-018

Matrix: SOIL

Received Date: 7/9/2020 9:18:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	460	60		mg/Kg	20	7/13/2020 11:58:26 AM	53665
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/12/2020 9:13:15 AM	53614
Surr: BFB	97.7	70-130		%Rec	1	7/12/2020 9:13:15 AM	53614
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	74	10		mg/Kg	1	7/11/2020 6:24:55 PM	53629
Motor Oil Range Organics (MRO)	90	50		mg/Kg	1	7/11/2020 6:24:55 PM	53629
Surr: DNOP	109	55.1-146		%Rec	1	7/11/2020 6:24:55 PM	53629
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/12/2020 9:13:15 AM	53614
Toluene	ND	0.048		mg/Kg	1	7/12/2020 9:13:15 AM	53614
Ethylbenzene	ND	0.048		mg/Kg	1	7/12/2020 9:13:15 AM	53614
Xylenes, Total	ND	0.096		mg/Kg	1	7/12/2020 9:13:15 AM	53614
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	7/12/2020 9:13:15 AM	53614
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	7/12/2020 9:13:15 AM	53614
Surr: Dibromofluoromethane	107	70-130		%Rec	1	7/12/2020 9:13:15 AM	53614
Surr: Toluene-d8	107	70-130		%Rec	1	7/12/2020 9:13:15 AM	53614

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007408

16-Jul-20

Client: Pima Environmental Services LLC

Project: Emerald PWU 20 1H

Sample ID: MB-53651	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 53651	RunNo: 70283								
Prep Date: 7/11/2020	Analysis Date: 7/11/2020	SeqNo: 2443142	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-53651	SampType: ics	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 53651	RunNo: 70283								
Prep Date: 7/11/2020	Analysis Date: 7/11/2020	SeqNo: 2443143	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.4	90	110			

Sample ID: MB-53665	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 53665	RunNo: 70304								
Prep Date: 7/13/2020	Analysis Date: 7/13/2020	SeqNo: 2443770	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-53665	SampType: ics	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 53665	RunNo: 70304								
Prep Date: 7/13/2020	Analysis Date: 7/13/2020	SeqNo: 2443771	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.1	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007408

16-Jul-20

Client: Pima Environmental Services LLC

Project: Emerald PWU 20 1H

Sample ID: MB-53629	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53629	RunNo: 70238								
Prep Date: 7/10/2020	Analysis Date: 7/11/2020	SeqNo: 2442220	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	12		10.00		121	55.1	146			

Sample ID: LCS-53629	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53629	RunNo: 70238								
Prep Date: 7/10/2020	Analysis Date: 7/11/2020	SeqNo: 2442221	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	106	70	130			
Surr: DNOP	4.9		5.000		97.0	55.1	146			

Sample ID: 2007408-001AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: S1, 0"-6"	Batch ID: 53629	RunNo: 70238								
Prep Date: 7/10/2020	Analysis Date: 7/11/2020	SeqNo: 2442223	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.4	47.13	0	92.4	47.4	136			
Surr: DNOP	4.5		4.713		95.2	55.1	146			

Sample ID: 2007408-001AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: S1, 0"-6"	Batch ID: 53629	RunNo: 70238								
Prep Date: 7/10/2020	Analysis Date: 7/11/2020	SeqNo: 2442224	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	9.7	48.40	0	92.4	47.4	136	2.60	43.4	
Surr: DNOP	4.4		4.840		91.6	55.1	146	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007408

16-Jul-20

Client: Pima Environmental Services LLC

Project: Emerald PWU 20 1H

Sample ID: mb-53614	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 53614	RunNo: 70265								
Prep Date: 7/9/2020	Analysis Date: 7/11/2020	SeqNo: 2442043	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.53		0.5000		107	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.1	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: Toluene-d8	0.50		0.5000		99.2	70	130			

Sample ID: ics-53614	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 53614	RunNo: 70265								
Prep Date: 7/9/2020	Analysis Date: 7/11/2020	SeqNo: 2442044	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	111	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.3	0.10	3.000	0	111	80	120			
Surr: 1,2-Dichloroethane-d4	0.55		0.5000		110	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.8	70	130			
Surr: Dibromofluoromethane	0.56		0.5000		111	70	130			
Surr: Toluene-d8	0.48		0.5000		96.4	70	130			

Sample ID: 2007408-001ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: S1, 0"-6"	Batch ID: 53614	RunNo: 70265								
Prep Date: 7/9/2020	Analysis Date: 7/11/2020	SeqNo: 2442046	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9814	0	116	71.1	115			S
Toluene	1.0	0.049	0.9814	0	106	79.6	132			
Ethylbenzene	1.1	0.049	0.9814	0	107	83.8	134			
Xylenes, Total	3.3	0.098	2.944	0	113	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.52		0.4907		107	70	130			
Surr: 4-Bromofluorobenzene	0.44		0.4907		89.4	70	130			
Surr: Dibromofluoromethane	0.55		0.4907		111	70	130			
Surr: Toluene-d8	0.48		0.4907		98.0	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007408

16-Jul-20

Client: Pima Environmental Services LLC**Project:** Emerald PWU 20 1H

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.024	0.9533	0	118	71.1	115	0.906	20	S
Toluene	1.0	0.048	0.9533	0	106	79.6	132	3.28	20	
Ethylbenzene	1.1	0.048	0.9533	0	111	83.8	134	0.748	20	
Xylenes, Total	3.4	0.095	2.860	0	117	82.4	132	0.974	20	
Surr: 1,2-Dichloroethane-d4	0.50		0.4766		106	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.48		0.4766		101	70	130	0	0	
Surr: Dibromofluoromethane	0.55		0.4766		115	70	130	0	0	
Surr: Toluene-d8	0.47		0.4766		98.8	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007408

16-Jul-20

Client: Pima Environmental Services LLC**Project:** Emerald PWU 20 1H

Sample ID: mb-53614	SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: PBS	Batch ID: 53614		RunNo: 70265							
Prep Date: 7/9/2020	Analysis Date: 7/11/2020		SeqNo: 2442071		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	450		500.0		89.8	70	130			

Sample ID: lcs-53614	SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: LCSS	Batch ID: 53614		RunNo: 70265							
Prep Date: 7/9/2020	Analysis Date: 7/11/2020		SeqNo: 2442072		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	5.0	25.00	0	75.9	70	130			
Surr: BFB	480		500.0		96.2	70	130			

Sample ID: 2007408-002ams	SampType: MS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: S1, 1'	Batch ID: 53614		RunNo: 70265							
Prep Date: 7/9/2020	Analysis Date: 7/11/2020		SeqNo: 2442076		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.73	0	84.3	70	130			
Surr: BFB	480		494.6		97.1	70	130			

Sample ID: 2007408-002amsd	SampType: MSD		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: S1, 1'	Batch ID: 53614		RunNo: 70265							
Prep Date: 7/9/2020	Analysis Date: 7/12/2020		SeqNo: 2442077		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.8	23.92	0	86.0	70	130	1.38	20	
Surr: BFB	470		478.5		97.3	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: Pima Environmental Services LLC Work Order Number: 2007408 RcptNo: 1

Received By: Juan Rojas 7/9/2020 9:18:00 AM *Juan Rojas*

Completed By: Juan Rojas 7/9/2020 10:12:55 AM *Juan Rojas*

Reviewed By: *em 7/9/20*

Chain of Custody

1. Is Chain of Custody complete? Yes No Not Present
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes No NA
4. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
5. Sample(s) in proper container(s)? Yes No
6. Sufficient sample volume for indicated test(s)? Yes No
7. Are samples (except VOA and ONG) properly preserved? Yes No
8. Was preservative added to bottles? Yes No NA
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes No NA
10. Were any sample containers received broken? Yes No
11. Does paperwork match bottle labels? Yes No
 (Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes No
13. Is it clear what analyses were requested? Yes No
14. Were all holding times able to be met? Yes No
 (If no, notify customer for authorization.)

of preserved bottles checked for pH: _____
 (<2 or >12 unless noted)
 Adjusted? _____
 Checked by: *JR 7/9/20*

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes No NA

Person Notified:	<input type="text"/>	Date	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.7	Good				

Chain-of-Custody Record

Client: Pima Environmental
 Mailing Address: 1601 N. Turner Ste 500
Holbb5, NM 88240
 Phone #: 575-631-6977
 email or Fax#: Chris @ PimaOil.com
 QA/QC Package: Standard Level 4 (Full Validation)
 Accreditation: Az Compliance NELAC Other EDD (Type)

Turn-Around Time: 5 Day
 Standard Rush
 Project Name: Emerald Pwly 20 1H
 Project #: 20715188
 Project Manager: Chris Jones
 Sampler: Chris Jones
 On Ice: Yes No
 # of Coolers: 1
 Cooler Temp (including CF): 0.5-0.1=0.7(°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
7/7/20	3:30	S717	S1, 0"-6"	Glass	Ice	2007406
	3:35		S1, 1'			-001
	3:40		S2, 0"-6"			-002
	3:45		S3, 0"-6"			-003
	3:50		S4, 0"-6"			-004
	3:55		S4, 1'			-005
	4:00		S5, 0"-6"			-006
	4:05		S5, 1'			-007
	4:10		S6, 0"-6"			-008
	4:15		S7, 0"-6"			-009
	4:20		S7, 1'			-010
	4:25		S8, 0"-6"			-011
						-012

Date: 7/8/20 Time: 4:33 Relinquished by: Colton Akerhoff
 Date: 7/8/20 Time: 1900 Relinquished by: Cummings
 Received by: Cummings Date: 7/8/20 Time: 1540
 Received by: Paul courier Date: 7/9/20 Time: 9:15



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX / MTBE / TMBs (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	<u>Chloride</u>
---------------------------	----------------------------	----------------------------	--------------------	--------------------------	---------------	--	------------	-----------------	---------------------------------	-----------------

Remarks: Bill to Devon

Chain-of-Custody Record

Client: Pima Environmental

Mailing Address: 1601 N. Turner Ste 500
Hobbs, NM 88240

Phone #: 575-631-6977

email or Fax#: Chris@pimadiv.com

QA/QC Package:
 Standard Level 4 (Full Validation)
 Accreditation: Az Compliance
 NELAC Other
 EDD (Type) _____

Turn-Around Time: 5 Days
 Standard Rush

Project Name: Emerald PwM 20 1H

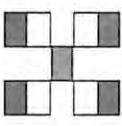
Project #: 20715188

Project Manager: Chris Jones

Sampler:
 On Ice: Yes No
 # of Coolers: 2

Cooler Temp (including CF): 0.5-0.1=0.3(°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
07/7/20	4:30	Soil	58, 1"	Glass	Ice	2007408
	4:35		59, 0"-6"			-013
	4:40		59, 0"			-014
	4:45		510, 0"-6"			-015
	4:50		511, 0"-6"			-016
	4:55		511, 1"			-017
						-018



HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX / MTBE / TMBs (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Chloride
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Relinquished by: Colton Ashcraft Date: 7/8/20 14:33

Relinquished by: AMunnis Date: 7/8/20 1900

Received by: Munnis Date: 7/8/20 1940

Received by: Devon Date: 7/19/20 9:18

Via: Carrier

Remarks: Bill to Devon

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Pima Environmental Services

Appendix E:
Work Plan
Approval Emails

HUNGRY HORSE, LLC

3709 S. Eunice HWY
P.O. Box 1058
Hobbs, NM 88241
Office: 575-393-3386
Fax: 575-391-4585
info@hungry-horse.com

DIRT WORK * ON-SITE REMEDIATION
SOIL TESTING * EXCAVATION * ELECTRICAL

20Feb18

To: Mike Bratcher, New Mexico Oil Conservation Division
Crystal Weaver, New Mexico Oil Conservation Division
Amber Groves, New Mexico State Land Office

Reference: Remediation Work Plan
Operator: Devon Energy Production Company
Location: Emerald PWU 20 1H
API: 30-015-38338
GPS: 32.6525 W-14.1045
NM OCD: 2RP 4281

Site Information

This site is located in rural Eddy County, New Mexico approximately 8.9 miles northwest of the intersection of Curry Comb Road and Highway 360 and 650 yards south of Curry Comb Road. The area is very sparsely vegetated with creosote bushes, mesquite bushes, and range grasses. There are no known water well or surface bodies of water within 1000' of this site. The New Mexico Office of the State Engineer list no groundwater data for this area, but the Eddy county Depth to Groundwater Map indicates groundwater to be 100' BGS. Thus, based on New Mexico Oil Conservation Division guidelines this site is assigned a Site Ranking Score of "0".

Work Conducted to Date

At the time of discovery, wells flowing to the battery were shut in and the repairs made to the three-phase separator. All released fluids remained on the caliche pad and no area off the pad was impacted. The impacted area is in a highly congested area of surface equipment and is approximately 20' x 20'. Two sample points were selected for soil sampling by use of a hand auger. (See attached chloride field test and lab analysis.)

Proposed Remediation

Due to hazards associated with working around the above ground piping/vessels and the sheer congestion of the area, the excavation of the impacted soil will have to be done with hand tools. I propose to hand excavate the impacted soil around the surface equipment to a depth of 1' BGS. The hand excavated soil will be stockpiled on plastic and disposed of at a division permitted facility. Fresh base course will be used for back fill with the area being brought back to grade, leveled, and raked.



Vernon K. Black, Hungry Horse, LLC

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

NM OIL CONSERVATION
ARTESIA DISTRICT
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 August 8, 2011

JUN 29 2017

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

RECEIVED

Release Notification and Corrective Action

NAB1718733399 OPERATOR Initial Report Final Report

Name of Company Devon Energy Production Company <i>Q137</i> Contact Danny Velo, Production Foreman	
Address 6488 Seven Rivers Hwy Artesia, NM 88210	Telephone No. 575-703-3360
Facility Name Emerald PWU 20 1H	Facility Type Oil
Surface Owner State	Mineral Owner State
API No 30-015-38338	

LOCATION OF RELEASE

Unit Letter D	Section 20	Township 19S	Range 29E	Feet from the 400'	North/South Line FNL	Feet from the 330'	East/West Line FWL	County Eddy
------------------	---------------	-----------------	--------------	-----------------------	-------------------------	-----------------------	-----------------------	----------------

Latitude: 32.6525154

Longitude: -104.1045456

NATURE OF RELEASE

Type of Release Oil & Produced Water	Volume of Release .5bbls oil & 4.5bbls produced water	Volume Recovered 0bbls recovered
Source of Release Water dump on three-phase separator	Date and Hour of Occurrence June 28, 2017 @ 7:00 PM	Date and Hour of Discovery June 28, 2017 @ 7:00 PM
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Shelly Tucker, BLM Mike Bratcher, OCD	
By Whom? Jesse Armendariz, Asst. Production Foreman	Date and Hour Shelly Tucker, BLM June 28, 2017 @ 9:38 PM Mike Bratcher, OCD June 28, 2017 @ 9:40 PM	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse N/A	
If a Watercourse was Impacted, Describe Fully.* N/A		
Describe Cause of Problem and Remedial Action Taken.* Three-phase separator was being bled down when gas and sand cut the water dump. The wells producing to the battery were shut in to stop the flow to the battery and then the water dump and three-phase separator were isolated.		
Describe Area Affected and Cleanup Action Taken.* Approximately .5bbls oil and 4.5bbls produced water were released on to location. All fluid remained on location and 0bbls were recovered. The affected area is approximately 13' x 12' on location. An environmental contractor will be contacted to assist with delineation and remediation		

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

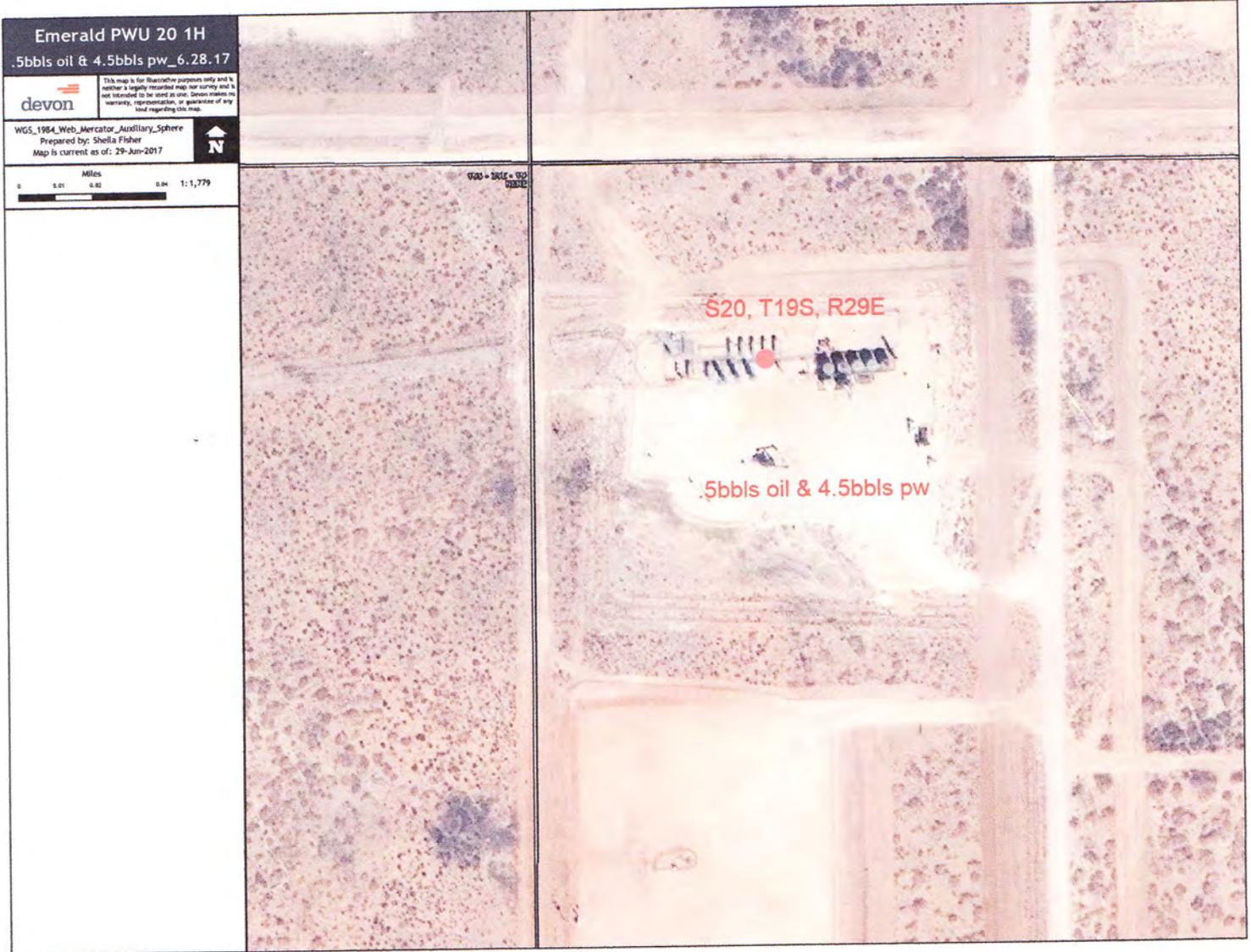
Signature: <i>Sheila Fisher</i>	OIL CONSERVATION DIVISION	
Printed Name: Sheila Fisher	Approved by Environmental Specialist: <i>Crystal W...</i>	
Title: Field Admin Support	Approval Date: <i>7/3/17</i>	Expiration Date: <i>N/A</i>
E-mail Address: <i>Sheila.fisher@dvn.com</i>	Conditions of Approval: <i>see attached</i>	Attached <input checked="" type="checkbox"/>

Date: 6/29/17 Phone: 575.748.1829

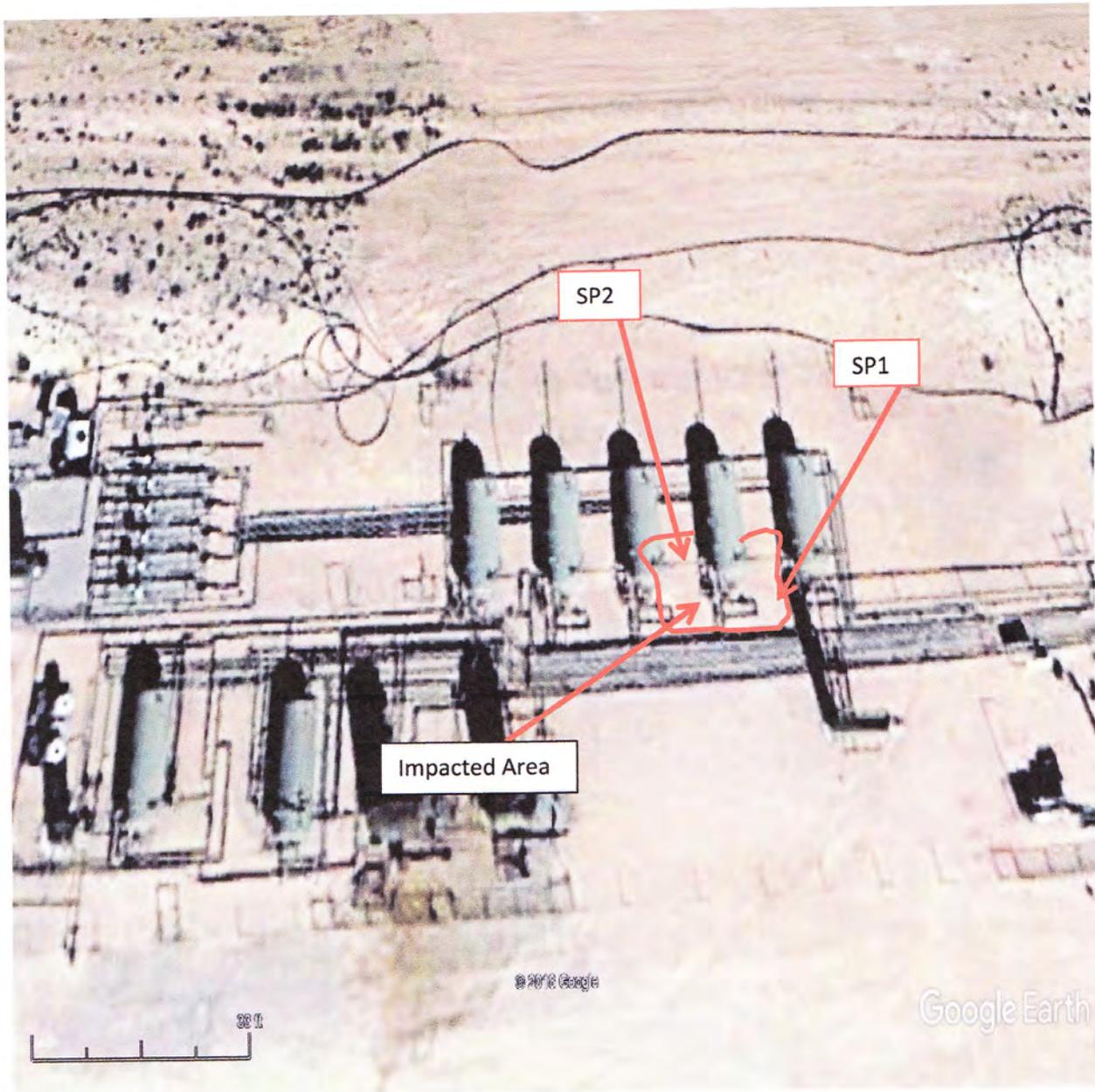
* Attach Additional Sheets If Necessary

Please refer to the New Mexico Oil Conservation Division Website for updated form(s) at:
<http://www.emnrd.state.nm.us/>
Thank you

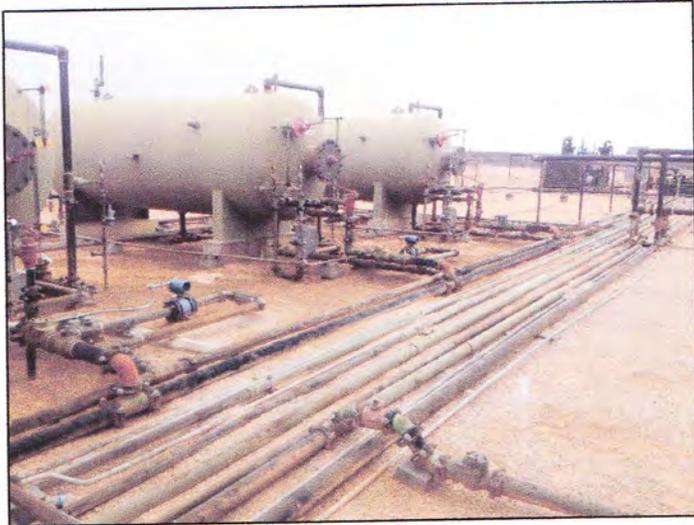
2RP4281



Devon Energy Production Company - Emerald PWU 20 1H



Devon Energy Production Company-Emerald PWU 20 1H





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

February 19, 2018

VERNON BLACK

Hungry Horse Environmental

P.O. Box 1058

Hobbs, NM 88240

RE: EMERALD PWU 201 H

Enclosed are the results of analyses for samples received by the laboratory on 02/14/18 11:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. 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 accredited 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,

A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 1 SURFACE (H800457-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.100	0.100	02/16/2018	ND	1.93	96.4	2.00	0.257	
Toluene*	0.244	0.100	02/16/2018	ND	1.87	93.4	2.00	1.08	
Ethylbenzene*	0.939	0.100	02/16/2018	ND	1.86	92.9	2.00	0.341	
Total Xylenes*	5.72	0.300	02/16/2018	ND	5.51	91.8	6.00	0.357	
Total BTEX	6.90	0.600	02/16/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID) 134 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	96.0	16.0	02/15/2018	ND	432	108	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*	285	50.0	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	22500	50.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	3990	50.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 129 % 41-142

Surrogate: 1-Chlorooctadecane 505 % 37.6-147

Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 1 1' (H800457-02)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.200	0.200	02/16/2018	ND	1.93	96.4	2.00	0.257	
Toluene*	<0.200	0.200	02/16/2018	ND	1.87	93.4	2.00	1.08	
Ethylbenzene*	<0.200	0.200	02/16/2018	ND	1.86	92.9	2.00	0.341	
Total Xylenes*	5.29	0.600	02/16/2018	ND	5.51	91.8	6.00	0.357	
Total BTEX	5.29	1.20	02/16/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID) 126 % 72-148

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	640	16.0	02/15/2018	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS						S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	448	10.0	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	8620	10.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	1230	10.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 151 % 41-142

Surrogate: 1-Chlorooctadecane 175 % 37.6-147

Cardinal Laboratories

* = Accredited Analyte

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 client for 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 thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential 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 the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 1 2' (H800457-03)

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	02/16/2018	ND	1.93	96.4	2.00	0.257		
Toluene*	<0.050	0.050	02/16/2018	ND	1.87	93.4	2.00	1.08		
Ethylbenzene*	<0.050	0.050	02/16/2018	ND	1.86	92.9	2.00	0.341		
Total Xylenes*	<0.150	0.150	02/16/2018	ND	5.51	91.8	6.00	0.357		
Total BTEX	<0.300	0.300	02/16/2018	ND						

Surrogate: 4-Bromofluorobenzene (PID) 102 % 72-148

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1800	16.0	02/15/2018	ND	432	108	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	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	134	10.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	<10.0	10.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 97.0 % 41-142

Surrogate: 1-Chlorooctadecane 96.2 % 37.6-147

Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 2 SURFACE (H800457-04)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.100	0.100	02/16/2018	ND	1.93	96.4	2.00	0.257	
Toluene*	<0.100	0.100	02/16/2018	ND	1.87	93.4	2.00	1.08	
Ethylbenzene*	0.412	0.100	02/16/2018	ND	1.86	92.9	2.00	0.341	
Total Xylenes*	3.00	0.300	02/16/2018	ND	5.51	91.8	6.00	0.357	
Total BTEX	3.41	0.600	02/16/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID) 118 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	880	16.0	02/15/2018	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS						S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	177	10.0	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	10100	10.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	1580	10.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 125 % 41-142

Surrogate: 1-Chlorooctadecane 210 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 2 1' (H800457-05)

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	02/16/2018	ND	1.93	96.4	2.00	0.257		
Toluene*	<0.050	0.050	02/16/2018	ND	1.87	93.4	2.00	1.08		
Ethylbenzene*	<0.050	0.050	02/16/2018	ND	1.86	92.9	2.00	0.341		
Total Xylenes*	<0.150	0.150	02/16/2018	ND	5.51	91.8	6.00	0.357		
Total BTEX	<0.300	0.300	02/16/2018	ND						

Surrogate: 4-Bromofluorobenzene (PID) 114 % 72-148

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	736	16.0	02/15/2018	ND	432	108	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*	24.6	10.0	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	2230	10.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	264	10.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 95.7 % 41-142

Surrogate: 1-Chlorooctadecane 146 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

Hungry Horse Environmental
 VERNON BLACK
 P.O. Box 1058
 Hobbs NM, 88240
 Fax To: (505) 391-4585

Received:	02/14/2018	Sampling Date:	02/09/2018
Reported:	02/19/2018	Sampling Type:	Soil
Project Name:	EMERALD PWU 201 H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

Sample ID: SP 2 2' (H800457-06)

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	02/16/2018	ND	1.93	96.4	2.00	0.257		
Toluene*	<0.050	0.050	02/16/2018	ND	1.87	93.4	2.00	1.08		
Ethylbenzene*	<0.050	0.050	02/16/2018	ND	1.86	92.9	2.00	0.341		
Total Xylenes*	<0.150	0.150	02/16/2018	ND	5.51	91.8	6.00	0.357		
Total BTEX	<0.300	0.300	02/16/2018	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 72-148

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	224	16.0	02/15/2018	ND	432	108	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	02/15/2018	ND	197	98.6	200	5.05		
DRO >C10-C28*	<10.0	10.0	02/15/2018	ND	216	108	200	24.8		
EXT DRO >C28-C36	<10.0	10.0	02/15/2018	ND						

Surrogate: 1-Chlorooctane 97.1 % 41-142

Surrogate: 1-Chlorooctadecane 97.3 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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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.
QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
ND Analyte NOT DETECTED at or above the reporting limit
RPD Relative Percent Difference
** Samples not received at proper temperature of 6°C or below.
*** Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: **Hungry Horse, LLC**
 Project Manager: **Vernon K. Black**
 Address: **P.O. Box 1058**
 City: **Hobbs** State: **NM** Zip: **88241**
 Phone #: **575-393-3381** Fax #: **575-391-4585**
 Project #: _____ Project Owner: **Devon**
 Project Name: **EMERALD PLU**
 Project Location: _____
 Sampler Name: **Alberto Baraza**

P.O. #: _____
 Company: _____
 Attn: _____
 Address: _____
 City: _____
 State: _____ Zip: _____
 Phone #: _____
 Fax #: _____

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	D	BTEX	PH											
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :						ACID/BASE:	ICE / COOL	OTHER :								
H80457	SP1 SURFACE	G				X																			
	SP1 1'																								
	SP1 2'																								
	SP2 SURFACE																								
	SP2 1'																								
	SP2 2'																								

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Relinquished By: *[Signature]*
 Date: **8/14/18**
 Received By: *[Signature]*
 Date: **11:00 AM**

Phone Result: Yes No
 Fax Result: Yes No
 Add'l Phone #: _____
 Add'l Fax #: _____

Delivered By: (Circle One) **#75**
 Sampler - UPS - Bus - Other: **4:40 / 4:50**
 Sample Condition: Intact Broken
 Cool: Yes No
 CHEMICAL BY: *[Signature]*

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

Bratcher, Mike, EMNRD

From: Bratcher, Mike, EMNRD
Sent: Thursday, June 7, 2018 7:32 AM
To: 'Vernon Black'; Weaver, Crystal, EMNRD; Ryan Mann (rmann@slo.state.nm.us)
Cc: Shoemaker, Mike
Subject: RE: Devon Emerald PWU 20 1H Plan

RE: Devon Energy * Emerald PWU 20 1H * 2RP-4281 * DOR: 6/28/17

Vernon,

Your proposal for remediation of the above referenced release is approved. Confirmation samples, with analytical data provided for OCD review required prior to backfill. Please advise once remedial activities have been scheduled.

MIKE: There are two more release events open on this site: 2RP-779 (26 bbl oil & PW release in 2011) and 2RP-4109 (remediation proposal approved 1/30/17).

Thank you,

Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, NM 88210
575-748-1283 Ext 108

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

From: Vernon Black <vblack@hungry-horse.com>
Sent: Monday, April 23, 2018 9:54 AM
To: Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Weaver, Crystal, EMNRD <Crystal.Weaver@state.nm.us>; Ryan Mann (rmann@slo.state.nm.us) <rmann@slo.state.nm.us>
Cc: Shoemaker, Mike <Mike.Shoemaker@dvn.com>
Subject: Devon Emerald PWU 20 1H Plan

Good morning,

Please see the attached work plan and corresponding lab report and spreadsheet for the above referenced remedation project. Please do not hesitate to call if you have questions.

Thanks in advance for your help.

Vernon K. Black
Hungry Horse, LLC
PO Box 1058
Hobbs, NM 88241

575-393-3386 office

575-631-2253 cell