

SITE INFORMATION

Report Type: Deferment Report 2RP-5161

General Site Information:

Site:	Blue Thunder Federal Com #001					
Company:	COG Operating LLC					
Section, Township and Range	Unit H	Sec. 05	T 19S	R 31E		
Lease Number:	API No. 30-015-34991					
County:	Eddy County					
GPS:	32.69087			-103.88563		
Surface Owner:	Federal					
Directions:	From the intersection of 249 and 222 head north on 222 for 230 feet, turn southwest onto unnamed lease road and follow road 0.63 miles, turn south and go 365 feet, turn southwest and go 260 feet miles and arrive at location					

Release Data:

Date Released:	12/21/2018
Type Release:	Crude Oil
Source of Contamination:	Hole in Oil Tank
Fluid Released:	20 bbl water
Fluids Recovered:	0 bbls water

Official Communication:

Name:	Ike Tavaréz		Clair Gonzales
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		901 West Wall Street
	600 W. Illinois Ave.		Suite 100
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	itavarez@concho.com		Clair.Gonzales@tetrattech.com

Site Characterization

Depth to Groundwater:	261' below surface
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Recommended Remedial Action Levels (RRALs)

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



TETRA TECH

May 23, 2019

Mr. Mike Bratcher
District Supervisor
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

Re: Deferment Report for the COG Operating, Blue Thunder 5 Federal Com #1, Unit H, Section 5, Township 19 South, Range 31 East, Eddy County, New Mexico. 2RP-5161

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating, LLC (COG) to assess a release that occurred at the Blue Thunder 5 Federal Com #1, Unit H, Section 5, Township 19 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are 32.69087°, -103.88563°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report the release was discovered on December 21, 2018. Approximately 20 barrels of crude oil was released due to a hole that formed in an oil stock tank, which has since been removed. A vacuum truck was dispatched, but no free-standing fluids were recovered. The release was contained within the earthen berm of the tank battery and measured approximately 20' X 20'. The initial C-141 Forms are included in Appendix A.

Site Characterization

A site characterization was performed for the site and no watercourses, lakebeds, sinkholes, playa lakes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, springs, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the specified distances and the site is in a low karst potential area. The nearest well is listed in the USGS National Water Information Database website in Section 35, Township 18 South, Range 31 East, approximately 2.36 miles northeast-east of the site, and has a reported depth to groundwater of 261 feet below ground surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is 175' to 200' below surface. The groundwater data is shown in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and

Tetra Tech

4000 North Big Spring, Suite 401, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



Releases, updated August 14, 2018. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the site characterization, the proposed RRAL for TPH is 2,500 mg/kg (GRO + DRO + MRO) and 1,000 mg/kg (GRO + DRO). Additionally, based on the site characterization, the proposed RRAL for chlorides is 20,000 mg/kg.

Remediation Activities

Tetra Tech personnel were onsite between March 3rd and 24th, 2019 to supervise the remediation activities. The release area was excavated to 1.5' below surface. Two (2) bottom hole composite samples (Bottom Hole 1 and Bottom Hole 2) and eight (8) sidewall composite samples (North Sidewall 1, North Sidewall 2, South Sidewall 1, South Sidewall 2, East Sidewall 1, East Sidewall 2, West Sidewall 1, and West Sidewall 2) were collected every 200 square feet to ensure proper removal of the impacted soils. The samples were submitted to the laboratory to be analyzed for TPH method 8015 extended, BTEX method 8021B, and Chloride by EPA Method 300.0. The sampling results are summarized in Table 1. The excavation depths and sample locations are shown in Figure 4.

Referring to Table 1, confirmation samples (Bottom Hole 2, North Sidewall 2, East Sidewall 1, East Sidewall 2, South Sidewall 2, and West Sidewall 2) showed benzene, total BTEX and TPH concentrations below the RRAL's. Additionally, all samples collected showed chloride concentrations below the RRAL's. However, confirmation samples (Bottom Hole 1, North Sidewall 1, South Sidewall 1, and West Sidewall 1) showed benzene, total BTEX, and TPH above the RRAL's.

Based on the laboratory results, one backhoe trench (T-1) was installed in the area of confirmation sample (Bottom Hole 1) to establish vertical delineation at the site. A TPH high of 1,753 mg/kg was noted at 0-1' (1.5' BEB) and a total BTEX high of 154 mg/kg was noted at 3' (1.5' BEB). The TPH and BTEX concentrations then declined with depth, to below the RRAL's at 4' (1.5' BEB).

The areas of confirmation samples (Bottom Hole 1 and West Sidewall 1) were then expanded to the maximum extent practical, with consideration given to the existing oilfield infrastructure and equipment in place. The area of Bottom Hole 1 was benched and excavated to 5.0' to remove the impacted material to the maximum extent safely possible, as vertically defined by trench (T-1). However, the area of (Bottom Hole 1) could not be resampled due to safety concerns for onsite personnel. The areas of (North Sidewall 1 and South Sidewall 1) could not be expanded due to the onsite tanks and equipment.

Approximately 30 cubic yards of material was excavated and transported offsite for proper disposal. The areas were then backfilled with clean material to surface grade.



TETRA TECH

Conclusion

Based on the laboratory results and remediation activities performed COG requests deferment of remaining impact until site abandonment. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

Johnathon Kell,
Geologist


cc: Ike Tavaréz – COG
Rebecca Haskell - COG
Jim Amos - BLM

Tables

Table 1
COG
Blue Thunder 5 Fed 1
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB Sample Depth (ft)	Soil Status		TPH (mg/kg)					Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	GRO+DRO	ORO	Total						
Bottom Hole 1	4/3/2019	-	1.5		X	3,360	2,910	6,270	33.7	6,304	2.97	91.9	29.0	247	371	80.0
Bottom Hole 2	4/8/2019	-	1.5	X		<10.0	20.6	20.6	<10.0	20.6	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
North Sidewall 1	4/3/2019	-	-	X		2,600	2,450	5,050	35.6	5,086	1.11	53.1	21.2	184	260	64.0
North Sidewall 2	4/8/2019	-	-	X		<10.0	11.9	11.9	<10.0	11.9	<0.050	<0.050	<0.050	<0.150	<0.300	80.0
East Sidewall 1	4/3/2019	-	-		X	3,240	2,650	5,890	42.2	5,932	5.35	124	31.0	251	412	16.0
	4/8/2019	-	-	X		14.7	50.0	64.7	<10.0	64.7	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
East Sidewall 2	4/8/2019	-	-	X		<10.0	11.1	11.1	<10.0	11.1	<0.050	<0.050	<0.050	<0.150	<0.300	80.0
South Sidewall 1	4/3/2019	-	-	X		3,850	2,540	6,390	33.7	6,424	8.50	176	42.2	342	569	160
South Sidewall 2	4/8/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
West Sidewall 1	4/3/2019	-	-		X	1,140	1,910	3,050	26.3	3,076	0.368	16.8	8.37	81.6	107	1,490
West Sidewall 2	4/8/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Trench 1	4/8/2019	0-1	1.5		X	944	809	1,753	<10.0	1,753	2.64	48.7	12.8	87.0	151	16.0
	"	2	"		X	107	187	294	<10.0	294	0.480	7.45	1.97	11.1	21.0	48.0
	"	3	"		X	703	752	1,455	<10.0	1,455	3.47	57.0	12.3	80.9	154	48.0
	"	4	"	X		30.7	57.7	88.4	<10.0	88.4	<0.050	0.217	0.104	0.678	0.998	32.0
	"	5	"	X		12.1	18.2	30.3	<10.0	30.3	<0.050	0.278	0.061	0.304	0.642	32.0
	"	6	"	X		<10.0	21.4	21.4	<10.0	21.4	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	8	"	X		<10.0	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	9	"	X		<10.0	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	96.0

BEB - Below Excavation Bottom

 Excavation Depths

Figures



LEGEND

- SITE LOCATION

Sources: Esri, HERE, Garmin,
Japan, METI, Esri China (Hong
Kong), Swatch, Swatch, Swatch,
OpenStreetMap contributors, and the
Geo-Community



FIGURE 1

BLUE THUNDER 5 FEDERAL #1
(32.690856°,-103.885636°)

OVERVIEW MAP

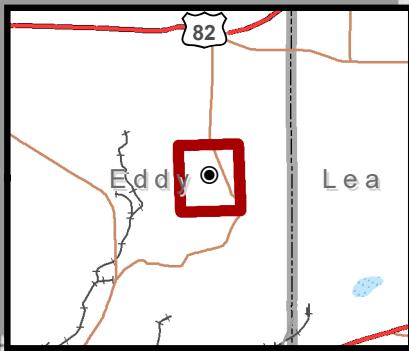
EDDY COUNTY, NEW MEXICO

Project : 212C-MD-00000

Date : 00/00/2018

File : H:\GIS\212C-MD-00000

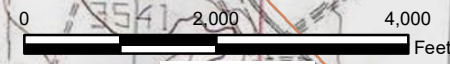




OVERALL VIEW 1:741,258





BLUE THUNDER 5 FEDERAL #1

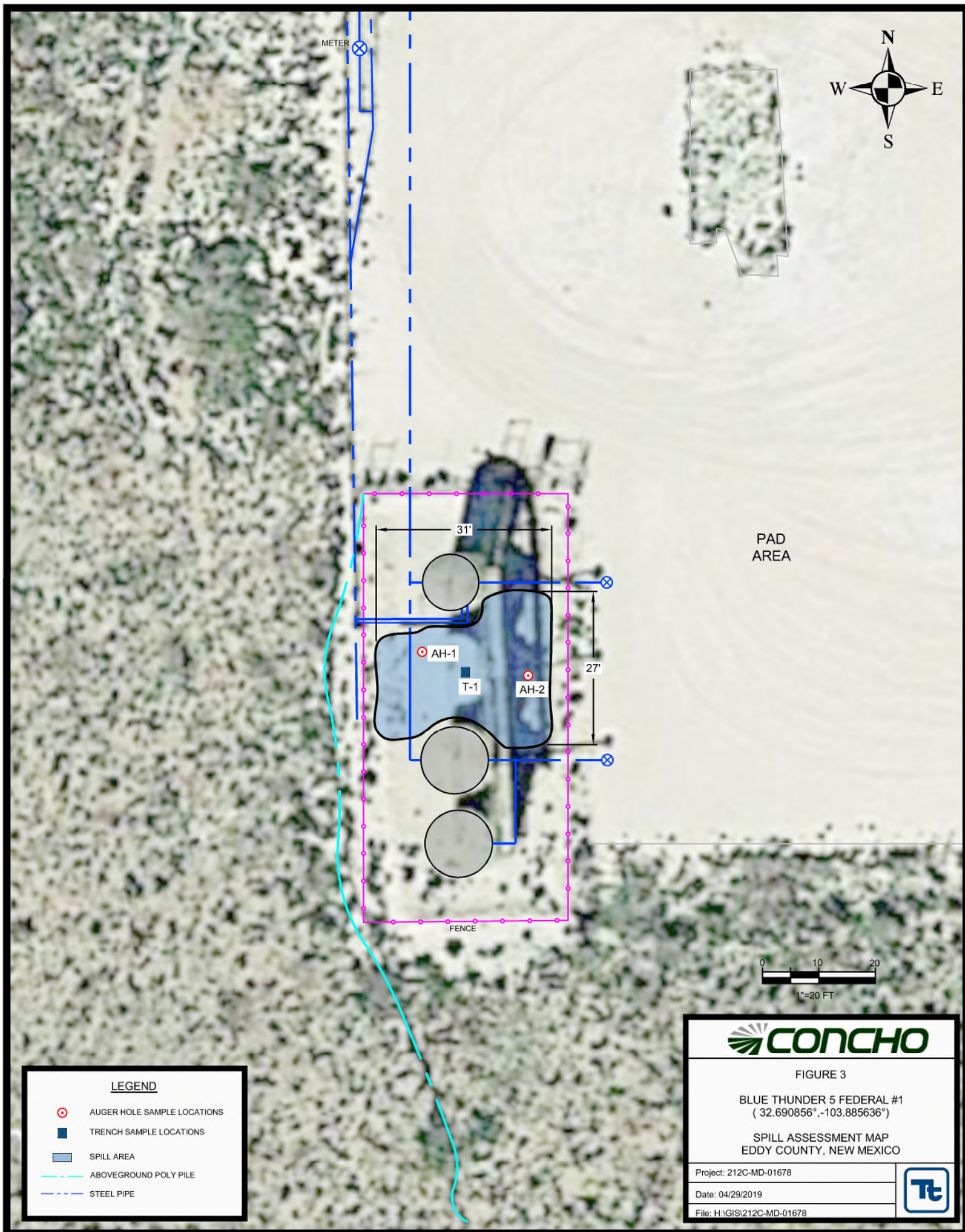


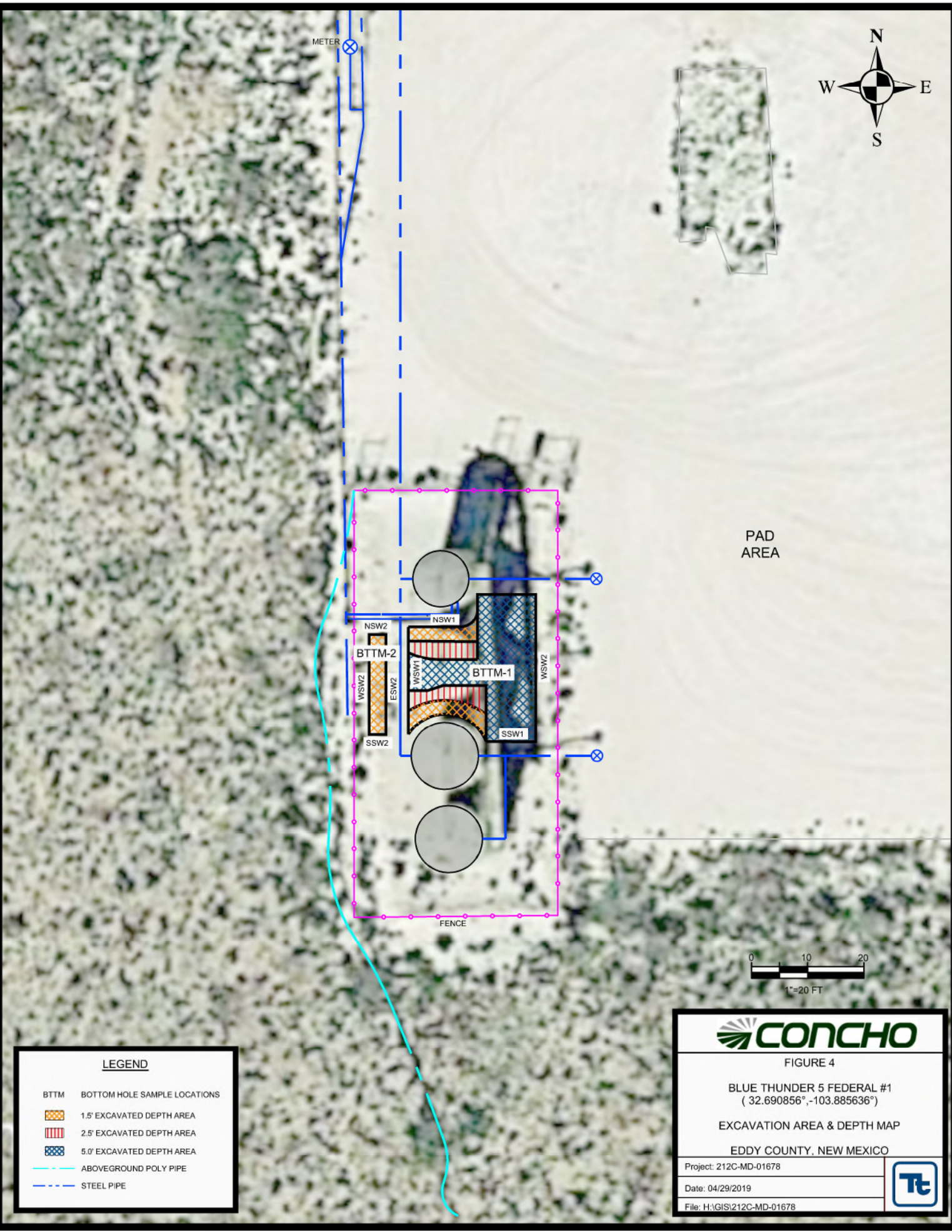
LEGEND

 SITE LOCATION


FIGURE 1
BLUE THUNDER 5 FEDERAL #1
(32.690856°,-103.885636°)
OVERVIEW MAP
EDDY COUNTY, NEW MEXICO
Project : 212C-MD-01678
Date : 04/29/2019
File : H:\GIS\212C-MD-01678







Photos

COG
Blue Thunder 5 Federal Com #1
Eddy County, New Mexico



Area of Excavation – View West



Area of Excavation – View South

Appendix A

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

State of New Mexico
Energy Minerals and Natural
Resources 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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

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

Location of Release Source

Latitude _____ Longitude _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# (if applicable)

Unit Letter	Section	Township	Range	County

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

Nature and Volume of Release

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

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride 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

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input 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 type="checkbox"/> The source of the release has been stopped. <input 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 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:	
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
Printed Name: _____	Title: _____
Signature: <u>Delann O'neal</u>	Date: _____
email: _____	Telephone: _____
<u>OCD Only</u>	
Received by: <u>Amalia B. Santamante</u>	Date: _____

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

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

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


<p>Characterization Report Checklist: <i>Each of the following items must be included in the report.</i></p> <ul style="list-style-type: none"><input type="checkbox"/> Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.<input type="checkbox"/> Field data<input type="checkbox"/> Data table of soil contaminant concentration data<input type="checkbox"/> Depth to water determination<input type="checkbox"/> Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release<input type="checkbox"/> Boring or excavation logs<input type="checkbox"/> Photographs including date and GIS information<input type="checkbox"/> Topographic/Aerial maps<input type="checkbox"/> Laboratory data including chain of custody
--

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

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: _____ Title: _____

Signature:  _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*


- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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

Printed Name: _____ Title: _____

Signature:  _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG-Blue Thunder Federal Com #001
Eddy County, New Mexico

18 South			30 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23 44	24
30	29	28	27	26	25
31	32	33	34	35	36

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

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

19 South			30 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31 90	32	33	34	35	36

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

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

20 South			30 East		
6	5 3.5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

20 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36 80

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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
 Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location



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National Water Information System: Web Interface

[USGS Water Resources](#)

Data Category:


Groundwater ▼

Geographic Area:

New Mexico ▼

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Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

site_no list =

- 324159103503801

Minimum number of levels = 1

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

USGS 324159103503801 18S.31E.35.31324

Available data for this site

Groundwater: Field measurements ▼

GO

Eddy County, New Mexico

Hydrologic Unit Code 13060011

Latitude 32°42'07.3", Longitude 103°50'50.1" NAD83

Land-surface elevation 3,630 feet above NAVD88

The depth of the well is 300 feet below land surface.

This well is completed in the Chinle Formation (231CHNL) local aquifer.

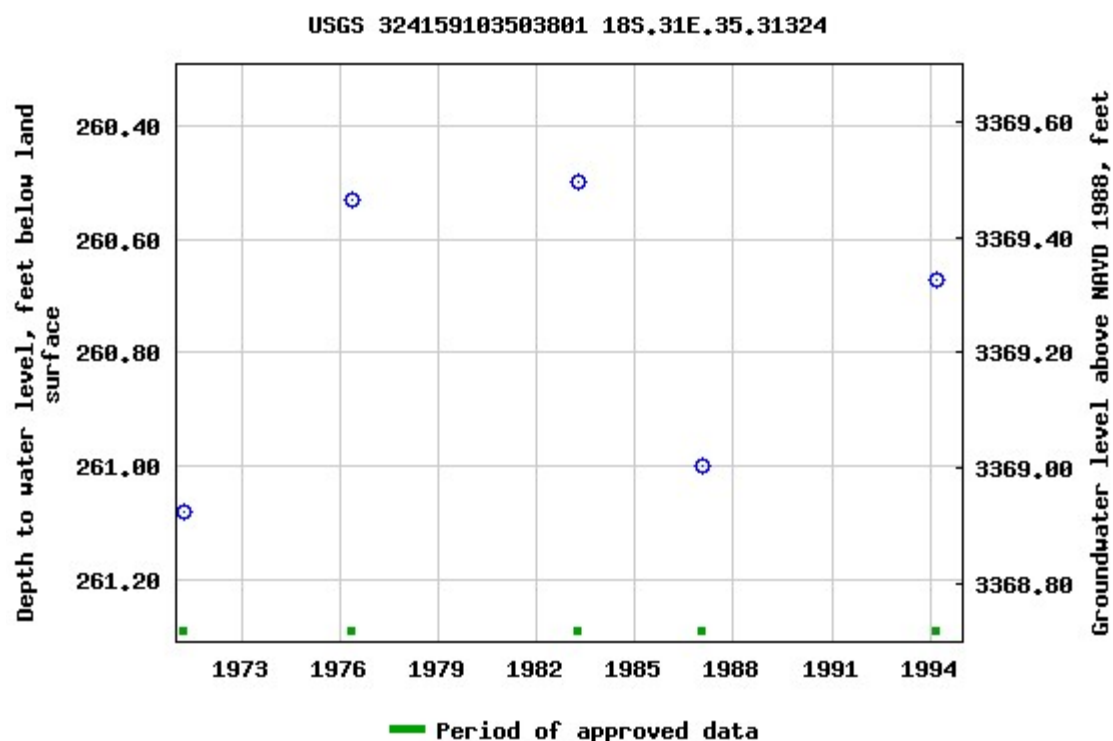
Output formats

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[Tab-separated data](#)

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Breaks in the plot represent a gap of at least one year between field measurements.

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Title: Groundwater for New Mexico: Water Levels

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



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

Page Last Modified: 2019-04-30 15:03:32 EDT

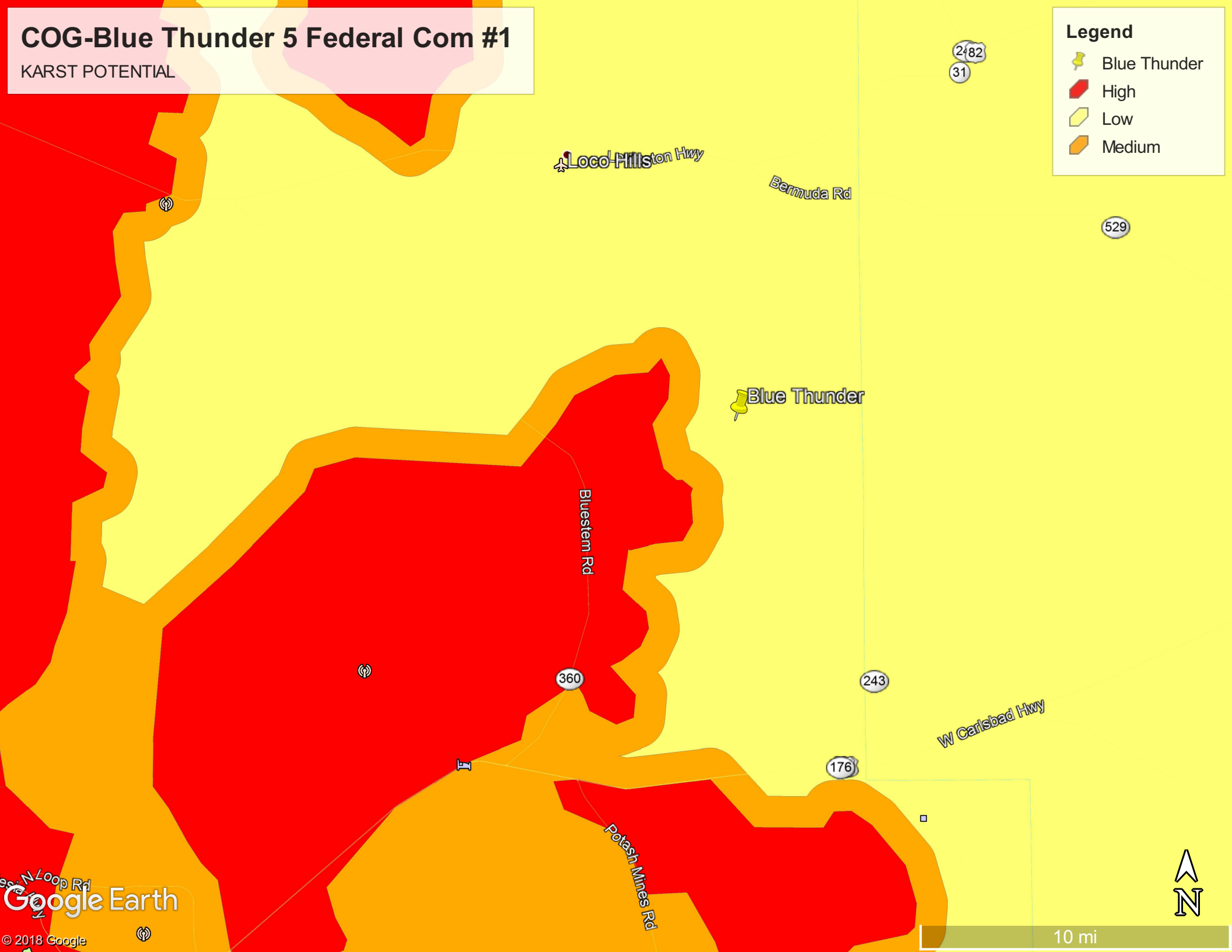
1.07 0.91 nadww01

COG-Blue Thunder 5 Federal Com #1

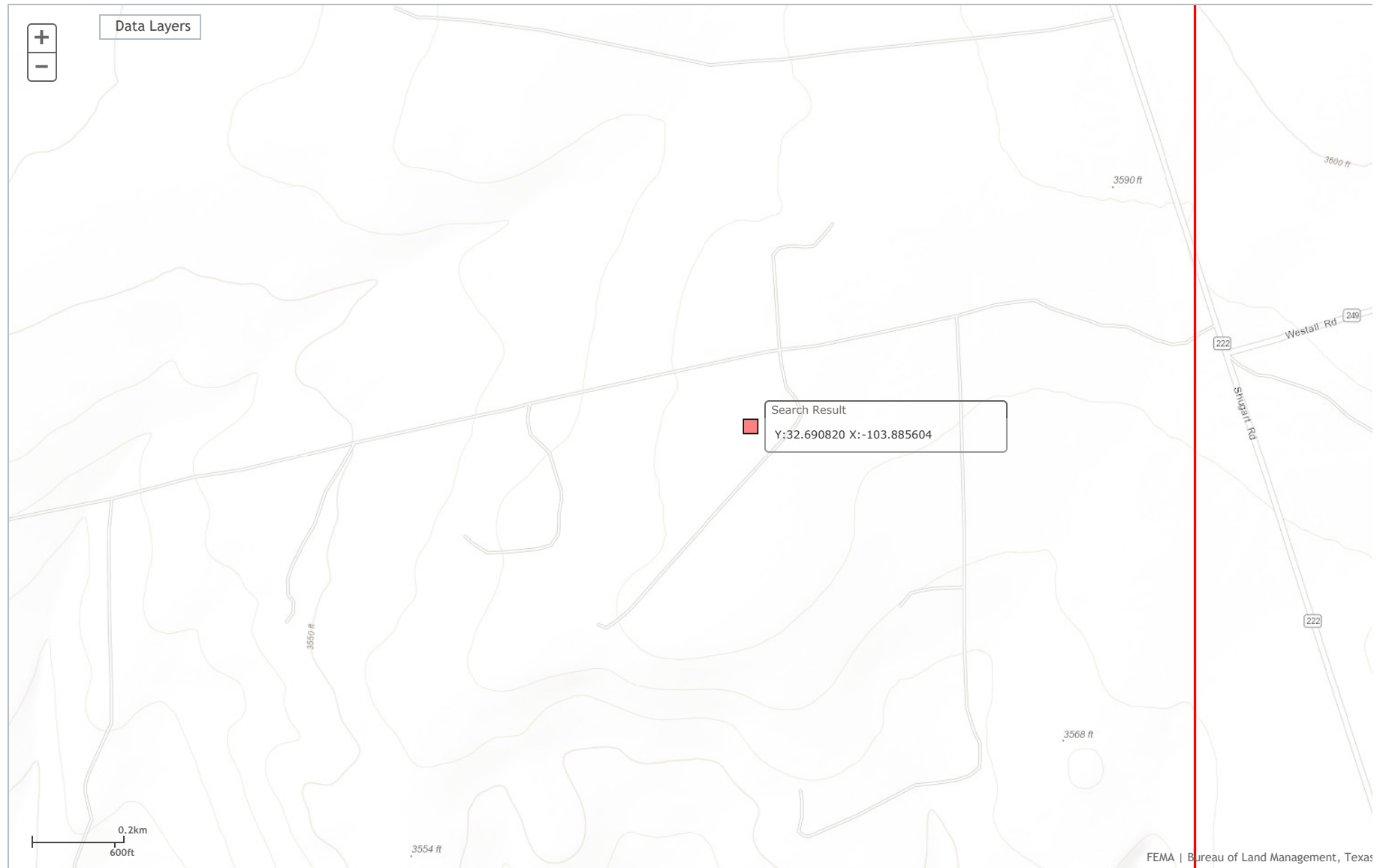
KARST POTENTIAL

Legend

-  Blue Thunder
-  High
-  Low
-  Medium



NFHL Web Mapping Application



Appendix C

April 04, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BLUE THUNDER 5 FED COM 1

Enclosed are the results of analyses for samples received by the laboratory on 04/03/19 13:35.

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

Cardinal Laboratories is 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,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/03/2019	Sampling Date:	04/03/2019
Reported:	04/04/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678 (12.21.18)	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: BOTTOM HOLE #1 (1.5' BEB) (H901226-01)

BTEX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	2.97	2.00	04/04/2019	ND	2.09	105	2.00	0.380	
Toluene*	91.9	2.00	04/04/2019	ND	1.87	93.7	2.00	1.81	
Ethylbenzene*	29.0	2.00	04/04/2019	ND	1.99	99.6	2.00	0.242	
Total Xylenes*	247	6.00	04/04/2019	ND	6.24	104	6.00	1.72	
Total BTEX	371	12.0	04/04/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 105 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	80.0	16.0	04/04/2019	ND	448	112	400	0.00	

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*	3360	10.0	04/03/2019	ND	179	89.4	200	8.61		
DRO >C10-C28*	2910	10.0	04/03/2019	ND	183	91.7	200	3.47		
EXT DRO >C28-C36	33.7	10.0	04/03/2019	ND						

Surrogate: 1-Chlorooctane 396 % 41-142

Surrogate: 1-Chlorooctadecane 104 % 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

Analytical Results For:

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

Received:	04/03/2019	Sampling Date:	04/03/2019
Reported:	04/04/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678 (12.21.18)	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: NORTH 1 SIDEWALL (H901226-02)

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	1.11	1.00	04/04/2019	ND	2.09	105	2.00	0.380	
Toluene*	53.1	2.00	04/04/2019	ND	1.87	93.7	2.00	1.81	
Ethylbenzene*	21.2	2.00	04/04/2019	ND	1.99	99.6	2.00	0.242	
Total Xylenes*	184	6.00	04/04/2019	ND	6.24	104	6.00	1.72	
Total BTEX	260	11.0	04/04/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	64.0	16.0	04/04/2019	ND	448	112	400	0.00		

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*	2600	10.0	04/03/2019	ND	179	89.4	200	8.61	
DRO >C10-C28*	2450	10.0	04/03/2019	ND	183	91.7	200	3.47	
EXT DRO >C28-C36	35.6	10.0	04/03/2019	ND					

Surrogate: 1-Chlorooctane 336 % 41-142

Surrogate: 1-Chlorooctadecane 100 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/03/2019	Sampling Date:	04/03/2019
Reported:	04/04/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678 (12.21.18)	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: EAST 1 SIDEWALL (H901226-03)

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	5.35	2.00	04/04/2019	ND	2.09	105	2.00	0.380	
Toluene*	124	2.00	04/04/2019	ND	1.87	93.7	2.00	1.81	
Ethylbenzene*	31.0	2.00	04/04/2019	ND	1.99	99.6	2.00	0.242	
Total Xylenes*	251	6.00	04/04/2019	ND	6.24	104	6.00	1.72	
Total BTEX	412	12.0	04/04/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	04/04/2019	ND	448	112	400	0.00		

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*	3240	10.0	04/03/2019	ND	179	89.4	200	8.61	
DRO >C10-C28*	2650	10.0	04/03/2019	ND	183	91.7	200	3.47	
EXT DRO >C28-C36	42.2	10.0	04/03/2019	ND					

Surrogate: 1-Chlorooctane 291 % 41-142

Surrogate: 1-Chlorooctadecane 106 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/03/2019	Sampling Date:	04/03/2019
Reported:	04/04/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678 (12.21.18)	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: SOUTH 1 SIDEWALL (H901226-04)

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	8.50	2.00	04/04/2019	ND	2.09	105	2.00	0.380	
Toluene*	176	2.00	04/04/2019	ND	1.87	93.7	2.00	1.81	
Ethylbenzene*	42.2	2.00	04/04/2019	ND	1.99	99.6	2.00	0.242	
Total Xylenes*	342	6.00	04/04/2019	ND	6.24	104	6.00	1.72	
Total BTEX	569	12.0	04/04/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	160	16.0	04/04/2019	ND	448	112	400	0.00		

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*	3850	10.0	04/04/2019	ND	179	89.4	200	8.61	
DRO >C10-C28*	2540	10.0	04/04/2019	ND	183	91.7	200	3.47	
EXT DRO >C28-C36	33.7	10.0	04/04/2019	ND					

Surrogate: 1-Chlorooctane 331 % 41-142

Surrogate: 1-Chlorooctadecane 103 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/03/2019	Sampling Date:	04/03/2019
Reported:	04/04/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678 (12.21.18)	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: WEST 1 SIDEWALL (H901226-05)

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.368	0.250	04/04/2019	ND	2.09	105	2.00	0.380	
Toluene*	16.8	0.500	04/04/2019	ND	1.87	93.7	2.00	1.81	
Ethylbenzene*	8.37	0.500	04/04/2019	ND	1.99	99.6	2.00	0.242	
Total Xylenes*	81.6	1.50	04/04/2019	ND	6.24	104	6.00	1.72	
Total BTX	107	2.75	04/04/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 112 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1490	16.0	04/04/2019	ND	448	112	400	0.00		

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*	1140	10.0	04/04/2019	ND	179	89.4	200	8.61	
DRO >C10-C28*	1910	10.0	04/04/2019	ND	183	91.7	200	3.47	
EXT DRO >C28-C36	26.3	10.0	04/04/2019	ND					

Surrogate: 1-Chlorooctane 254 % 41-142

Surrogate: 1-Chlorooctadecane 90.7 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

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

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Analysis Request of Custody Record



Tetra Tech, Inc.

 901W Wall Street, Ste 100
 Midland, Texas 79705
 Tel (432) 682-4559
 Fax (432) 682-3946

Client Name: COA		Site Manager: CLAIR GONZALES	
Project Name: BLUE THUNDER SED COM 1 (12.21.18)		Project #: 212C-WD-01678	
Project Location: Eddy Co, NM		Invoice to: COA-LIKE TANABEZ	
Receiving Laboratory: CARDINAL		Sampler Signature: CONNOR MOHEZINIA	
Comments: TONY LEONARDA			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD				# CONTAINERS	FILTERED (Y/N)	ANALYSIS REQUEST (Circle or Specify Method No.)	
		DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE	None				
													YEAR: 2019
1	Bottom Hole # 1 (1.6' BEB)	4/3/14			X						1	2	BTEX 8021B BTEX 8260B
2	NORTH 1 Sidewall	4/3/14			X			X			1	2	TPH TX1005 (Ext to C35)
3	EAST 1 Sidewall	4/3/14			X			X			1	2	TPH 8015M (GRO - DRO - ORO - MRO)
4	South 1 Sidewall	4/3/14			X			X			1	2	PAH 8270C
5	WEST 1 Sidewall	4/3/14			X			X			1	2	Total Metals Ag As Ba Cd Cr Pb Se Hg
													TCLP Metals Ag As Ba Cd Cr Pb Se Hg
													TCLP Volatiles
													TCLP Semi Volatiles
													RCI
													GC/MS Vol. 8260B / 624
													GC/MS Semi. Vol. 8270C/625
													PCB's 8082 / 608
													NORM
													PLM (Asbestos)
													Chloride
													Chloride Sulfate TDS
													General Water Chemistry (see attached list)
													Anion/Cation Balance
													Hold

Relinquished by: <i>Connie M. Gonzales</i>	Date: 4/3/14	Time: 1337	Received by: <i>Clair Gonzales</i>	Date: 4/3/14	Time: 1335
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY	REMARKS:
<input type="checkbox"/> STANDARD	
<input checked="" type="checkbox"/> RUSH: Same Day (24 hr)	
<input type="checkbox"/> Rush Charges Authorized	
<input type="checkbox"/> Special Report Limits or TRRP Report	

Sample Temperature: 4.4°C

LAB USE ONLY

4.4°C

#97

ORIGINAL COPY

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

April 09, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BLUE THUNDER 5 FED COM 1

Enclosed are the results of analyses for samples received by the laboratory on 04/08/19 16:05.

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

Cardinal Laboratories is 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,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (0-1') (1.5' BEB) (H901278-01)

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	2.64	1.00	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	48.7	1.00	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	12.8	1.00	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	87.0	3.00	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTX	151	6.00	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 102 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	04/09/2019	ND	400	100	400	3.92	

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*	944	10.0	04/08/2019	ND	199	99.7	200	10.3	QM-07	
DRO >C10-C28*	809	10.0	04/08/2019	ND	182	91.2	200	3.08	QM-07	
EXT DRO >C28-C36	<10.0	10.0	04/08/2019	ND						

Surrogate: 1-Chlorooctane 143 % 41-142

Surrogate: 1-Chlorooctadecane 91.4 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (2') (1.5' BEB) (H901278-02)

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.480	0.050	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	7.45	0.050	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	1.97	0.050	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	11.1	0.150	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTEX	21.0	0.300	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 114 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	04/09/2019	ND	400	100	400	3.92	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	107	10.0	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	187	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 89.0 % 41-142

Surrogate: 1-Chlorooctadecane 87.2 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (3') (1.5' BEB) (H901278-03)

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	3.47	1.00	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	57.0	1.00	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	12.3	1.00	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	80.9	3.00	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTEX	154	6.00	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.3 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	04/09/2019	ND	400	100	400	3.92		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	703	10.0	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	752	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 121 % 41-142

Surrogate: 1-Chlorooctadecane 86.5 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (4') (1.5' BEB) (H901278-04)

BTX 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	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	0.217	0.050	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	0.104	0.050	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	0.678	0.150	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTX	0.998	0.300	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 95.5 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	04/09/2019	ND	400	100	400	3.92		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	30.7	10.0	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	57.7	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 91.6 % 41-142

Surrogate: 1-Chlorooctadecane 87.8 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (5') (1.5' BEB) (H901278-05)

BTX 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	04/09/2019	ND	1.69	84.3	2.00	1.34	
Toluene*	0.278	0.050	04/09/2019	ND	1.74	86.8	2.00	0.924	
Ethylbenzene*	0.061	0.050	04/09/2019	ND	1.74	87.1	2.00	0.579	
Total Xylenes*	0.304	0.150	04/09/2019	ND	5.11	85.2	6.00	0.977	
Total BTX	0.642	0.300	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 97.7 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	04/09/2019	ND	400	100	400	3.92		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	12.1	10.0	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	18.2	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 85.8 % 41-142

Surrogate: 1-Chlorooctadecane 82.0 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (6') (1.5' BEB) (H901278-06)

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	04/09/2019	ND	1.69	84.3	2.00	1.34		
Toluene*	<0.050	0.050	04/09/2019	ND	1.74	86.8	2.00	0.924		
Ethylbenzene*	<0.050	0.050	04/09/2019	ND	1.74	87.1	2.00	0.579		
Total Xylenes*	<0.150	0.150	04/09/2019	ND	5.11	85.2	6.00	0.977		
Total BTEx	<0.300	0.300	04/09/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 90.3 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	04/09/2019	ND	400	100	400	3.92	

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	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	21.4	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 83.9 % 41-142

Surrogate: 1-Chlorooctadecane 85.1 % 37.6-147

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Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (8') (1.5' BEB) (H901278-07)

BTX 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	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	<0.050	0.050	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	<0.050	0.050	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	<0.150	0.150	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTX	<0.300	0.300	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.2 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	64.0	16.0	04/09/2019	ND	400	100	400	3.92		

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	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	<10.0	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 82.9 % 41-142

Surrogate: 1-Chlorooctadecane 82.8 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	04/08/2019	Sampling Date:	04/08/2019
Reported:	04/09/2019	Sampling Type:	Soil
Project Name:	BLUE THUNDER 5 FED COM 1	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01678	Sample Received By:	Tamara Oldaker
Project Location:	COG- EDDY CO NM		

Sample ID: TRENCH - 1 (9') (1.5' BEB) (H901278-08)

BTX 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	04/09/2019	ND	1.80	89.9	2.00	0.879	
Toluene*	<0.050	0.050	04/09/2019	ND	1.68	84.2	2.00	0.693	
Ethylbenzene*	<0.050	0.050	04/09/2019	ND	1.74	87.1	2.00	1.77	
Total Xylenes*	<0.150	0.150	04/09/2019	ND	5.27	87.8	6.00	2.01	
Total BTX	<0.300	0.300	04/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 91.1 % 73.3-129

Chloride, SM4500CI-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	04/09/2019	ND	400	100	400	3.92		

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	04/09/2019	ND	199	99.7	200	10.3	
DRO >C10-C28*	<10.0	10.0	04/09/2019	ND	182	91.2	200	3.08	
EXT DRO >C28-C36	<10.0	10.0	04/09/2019	ND					

Surrogate: 1-Chlorooctane 88.9 % 41-142

Surrogate: 1-Chlorooctadecane 83.3 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

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

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Celey D. Keene, Lab Director/Quality Manager

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

[illegible]



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

April 23, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: BLUE THUNDER 5 FED - 1H

Enclosed are the results of analyses for samples received by the laboratory on 04/08/19 16:05.

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

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

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

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

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

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BOTTOM HOLE #2 (1.5' BEB)	H901279-01	Soil	08-Apr-19 00:00	08-Apr-19 16:05
WEST 2 SIDEWALL	H901279-02	Soil	08-Apr-19 00:00	08-Apr-19 16:05
NORTH 2 SIDEWALL	H901279-03	Soil	08-Apr-19 00:00	08-Apr-19 16:05
EAST 2 SIDEWALL	H901279-04	Soil	08-Apr-19 00:00	08-Apr-19 16:05
SOUTH 2 SIDEWALL	H901279-05	Soil	08-Apr-19 00:00	08-Apr-19 16:05
SOUTH 1 SIDEWALL	H901279-06	Soil	08-Apr-19 00:00	08-Apr-19 16:05

Sample ID for H901279-06 changed from 'East 3 Sidewall' to 'South 1 Sidewall' as per Conner 04/23/19. This is the revised report as per those instructions. This report will replace the one sent on 04/09/19.

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

BOTTOM HOLE #2 (1.5' BEB) H901279-01 (Soil)

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

Inorganic Compounds

Chloride	48.0		16.0	mg/kg	4	9040907	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			89.3 %	73.3-129		9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	20.6		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			81.2 %	41-142		9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			79.7 %	37.6-147		9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

WEST 2 SIDEWALL H901279-02 (Soil)

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

Inorganic Compounds

Chloride	32.0		16.0	mg/kg	4	9040907	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			95.3 %		73.3-129	9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			79.2 %		41-142	9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			77.9 %		37.6-147	9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

NORTH 2 SIDEWALL

H901279-03 (Soil)

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

Inorganic Compounds

Chloride	80.0		16.0	mg/kg	4	9040907	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			102 %		73.3-129	9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	11.9		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			78.2 %		41-142	9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			76.0 %		37.6-147	9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

EAST 2 SIDEWALL H901279-04 (Soil)

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

Inorganic Compounds

Chloride	80.0		16.0	mg/kg	4	9040907	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			105 %		73.3-129	9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	11.1		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			80.5 %		41-142	9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			78.7 %		37.6-147	9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

SOUTH 2 SIDEWALL

H901279-05 (Soil)

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

Inorganic Compounds

Chloride	64.0		16.0	mg/kg	4	9040908	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			103 %		73.3-129	9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			82.7 %		41-142	9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			75.9 %		37.6-147	9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

SOUTH 1 SIDEWALL

H901279-06 (Soil)

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

Inorganic Compounds

Chloride	32.0		16.0	mg/kg	4	9040908	AC	09-Apr-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9040818	MS	09-Apr-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9040818	MS	09-Apr-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			101 %		73.3-129	9040818	MS	09-Apr-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	14.7		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
DRO >C10-C28*	50.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9040816	MS	09-Apr-19	8015B	

Surrogate: 1-Chlorooctane			87.8 %		41-142	9040816	MS	09-Apr-19	8015B	
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Surrogate: 1-Chlorooctadecane			82.3 %		37.6-147	9040816	MS	09-Apr-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 9040907 - General Prep - Wet Chem

Blank (9040907-BLK1)

Prepared & Analyzed: 09-Apr-19

Chloride	ND	16.0	mg/kg						
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LCS (9040907-BS1)

Prepared & Analyzed: 09-Apr-19

Chloride	400	16.0	mg/kg	400	100	80-120			
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LCS Dup (9040907-BSD1)

Prepared & Analyzed: 09-Apr-19

Chloride	416	16.0	mg/kg	400	104	80-120	3.92	20	
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Batch 9040908 - General Prep - Wet Chem

Blank (9040908-BLK1)

Prepared & Analyzed: 09-Apr-19

Chloride	ND	16.0	mg/kg						
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LCS (9040908-BS1)

Prepared & Analyzed: 09-Apr-19

Chloride	416	16.0	mg/kg	400	104	80-120			
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LCS Dup (9040908-BSD1)

Prepared & Analyzed: 09-Apr-19

Chloride	416	16.0	mg/kg	400	104	80-120	0.00	20	
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Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

Volatile Organic Compounds by EPA Method 8021 - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 9040818 - Volatiles

Blank (9040818-BLK1)

Prepared: 08-Apr-19 Analyzed: 09-Apr-19

Benzene	ND	0.050	mg/kg						
Toluene	ND	0.050	mg/kg						
Ethylbenzene	ND	0.050	mg/kg						
Total Xylenes	ND	0.150	mg/kg						
Total BTEX	ND	0.300	mg/kg						
Surrogate: 4-Bromofluorobenzene (PID)	0.0991		mg/kg	0.100		99.1	73.3-129		

LCS (9040818-BS1)

Prepared: 08-Apr-19 Analyzed: 09-Apr-19

Benzene	1.69	0.050	mg/kg	2.00		84.3	72.2-131		
Toluene	1.74	0.050	mg/kg	2.00		86.8	71.7-126		
Ethylbenzene	1.74	0.050	mg/kg	2.00		87.1	68.9-126		
Total Xylenes	5.11	0.150	mg/kg	6.00		85.2	71.4-125		
Surrogate: 4-Bromofluorobenzene (PID)	0.107		mg/kg	0.100		107	73.3-129		

LCS Dup (9040818-BSD1)

Prepared: 08-Apr-19 Analyzed: 09-Apr-19

Benzene	1.71	0.050	mg/kg	2.00		85.4	72.2-131	1.34	6.91
Toluene	1.75	0.050	mg/kg	2.00		87.6	71.7-126	0.924	7.12
Ethylbenzene	1.75	0.050	mg/kg	2.00		87.6	68.9-126	0.579	7.88
Total Xylenes	5.16	0.150	mg/kg	6.00		86.0	71.4-125	0.977	7.46
Surrogate: 4-Bromofluorobenzene (PID)	0.105		mg/kg	0.100		105	73.3-129		

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Project: BLUE THUNDER 5 FED - 1H
Project Number: 212C-MD-01678
Project Manager: CLAIR GONZALES
Fax To: (432) 682-3946

Reported:
23-Apr-19 15:49

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9040816 - General Prep - Organics

Blank (9040816-BLK1)

Prepared & Analyzed: 08-Apr-19

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	40.4		mg/kg	50.0		80.8	41-142			
Surrogate: 1-Chlorooctadecane	40.7		mg/kg	50.0		81.4	37.6-147			

LCS (9040816-BS1)

Prepared & Analyzed: 08-Apr-19

GRO C6-C10	199	10.0	mg/kg	200		99.7	76.5-133			
DRO >C10-C28	182	10.0	mg/kg	200		91.2	72.9-138			
Total TPH C6-C28	382	10.0	mg/kg	400		95.4	78-132			
Surrogate: 1-Chlorooctane	44.6		mg/kg	50.0		89.2	41-142			
Surrogate: 1-Chlorooctadecane	41.1		mg/kg	50.0		82.2	37.6-147			

LCS Dup (9040816-BSD1)

Prepared & Analyzed: 08-Apr-19

GRO C6-C10	180	10.0	mg/kg	200		89.9	76.5-133	10.3	20.6	
DRO >C10-C28	177	10.0	mg/kg	200		88.4	72.9-138	3.08	20.6	
Total TPH C6-C28	356	10.0	mg/kg	400		89.1	78-132	6.81	18	
Surrogate: 1-Chlorooctane	42.5		mg/kg	50.0		85.0	41-142			
Surrogate: 1-Chlorooctadecane	42.3		mg/kg	50.0		84.6	37.6-147			

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*=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 or 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 damage 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

Notes and Definitions

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

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Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240

(575) 393-2326 FAX (575) 393-2476

Company Name: TETRA TECH

Project Manager: CLAIRE CONALES

Address: 8701 W. WAL ST. STE 100

City: MIDLAND State: TX Zip: 79705

Phone #: Fax #:

Project #: 212 C-MO-DIG 78 Project Owner:

Project Name: BLUE TRUNDER 5 FED-1M (COG)

Project Location: Eddy Co, NM

Sample Name: CORNER MOERZING / TONY LUGAZO

P.O. #:

Company: COG

Attn: ILE TRUWERY

Address:

City:

State: Zip:

Phone #:

Fax #:

FOR LAB USE ONLY

Lab I.D. Sample I.D.

Bottom Hole # 2 (1.5 BEB)

WEST 2 Sidewall

NORTH 2 Sidewalls

EAST 2 Sidewall

SOUTH 2 Sidewall

EAST 2 Sidewall

SOUTH 1

(G)RAB OR (C)OMP.

CONTAINERS

GROUNDWATER

WASTEWATER

SOIL

OIL

SLUDGE

OTHER :

ACID/BASE:

ICE / COOL

OTHER :

DATE

TIME

BTEX 8021B BTEX 8260B

TPH 8015M (ARO-DRO-ORO-MRO)

Chloride.

Relinquished By: Corner Mporling

Date: 4/8/19

Time: 16:05

Received By: Tamara Alabek

Date: 4/8/19

Time:

Delivered By: (Circle One)

Sampler - UPS - Bus - Other:

Sample Condition

Cool ☒ Intact ☒

Yes ☒ No ☐

CHECKED BY: (Initials)

REMARKS:

24 hr. Rush

* Sample ID revised as per Corner. 04/23/19