SITE INFORMATION

Report Type: Closure Report / Deferment Request

General Site Information:						
Site:	**King Tut Federal #1H**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit D**	**Sec. 30**	**T 24S**	**R 32E**		
County:	**Lea County**					
GPS:	**32.19467**			**-103.71971**		
Surface Owner:	**Federal**					
Directions:	From NM 128 & Buck Johnson Rd in Lea County, travel SOUTHWEST on Buck Johnson for 0.40 mi, turn SOUTH onto lease road for 2.5 mi, turn EAST onto lease road for 0.25 mi to location.					

REVIEWED
By Dylan Rose-Coss at 2:35 pm, Aug 15, 2019

NOT APPROVED

Release Data:	
Date Released:	2/8/2019
Type Release:	Produced Water
Source of Contamination:	Flowline
Fluid Released:	10 bbl water
Fluids Recovered:	5 bbls water

Official Communication:			
Name:	Ike Tavarez		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@tetratech.com

Site Characterization	
Depth to Groundwater:	*290' below surface*

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

March 27, 2018

Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico, 88240

Re: Closure Report for the COG Operating LLC., King Tut Federal #1H, Unit D, Section 30, Township 24 South, Range 32 East, Lea County, New Mexico.

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess a release that occurred at King Tut Federal #1H, Unit D, Section 30, Township 24 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are 32.19467º, -103.71971º. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release occurred on February 8, 2019, and released approximately ten (10) barrels of produced water due to a poly flowline rupturing. Vacuum trucks were used to remove the freestanding fluids, recovering approximately five (5) barrels of produced water. The release occurred on a pipeline right of way (ROW), impacting an area measuring approximately 100' x 20'. The initial C-141 form is 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 on the USGS National Water Information System in Section 33, approximately 3.1 miles southeast of the site, and has a reported depth to groundwater of 290 feet below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 325 and 350 feet 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 Releases,

Tetra Tech
4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

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.

Soil Assessment and Analytical Results

On February 20, 2019, Tetra Tech personnel were onsite to evaluate and sample the release area along the ROW, after verifying the locations of numerous buried lines. Four (4) auger holes (AH-1, AH-2, AH-3, and AH-4) were installed in the release area to total depths ranging from 7.0'-7.5' to 10.0' below surface. Additionally, five (5) horizontal delineation samples (Horizontal North-1, Horizontal West-1, Horizontal South-1, Horizontal South-2, and Horizontal East-1) were collected outside of the spill footprint. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Horizontals

Referring to Table 1, none of the horizontal delineation samples (Horizontal North-1, Horizontal West-1, Horizontal South-1, Horizontal South-2, and Horizontal East-1) showed any benzene, total BTEX, TPH, or chloride concentrations above the RRAL's.

Auger holes

Referring to Table 1, none of the samples analyzed showed benzene, total BTEX, or TPH concentrations above the laboratory reporting limits. Additionally, the chloride concentrations detected in the areas of auger holes (AH-1, AH-2, AH-3, and AH-4) were below the RRAL with chloride highs of 8,060 mg/kg (0-1.0'), 4,570 mg/kg (5.0'-5.5''), 15,100 mg/kg (1.0'-1.5'), 8,600 mg/kg (0-1.0'), respectively.

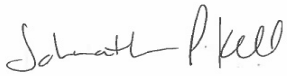
Conclusion

The release area on the ROW did not show any benzene, total BTEX, TPH or chloride concentrations above the RRALs. Due to numerous aboveground, buried lines, and electric lines in the area, the release area on the ROW is not accessible and cannot be safely reclaimed or excavated.

Due to the safety issues and the chloride concentrations below the RRAL, COG requests closure of this spill issue and proposes to defer the restoration and reclamation activities on the ROW until abandonment. If you have any questions or comments concerning the assessment activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager



Johnathon Kell,
Geologist

cc: Sheldon Hitchcock - COG
Ike Tavarez - COG
Dakota Neel – COG
Rebecca Haskell – COG
Jim Amos – BLM

Figures

CONCHO

FIGURE 1

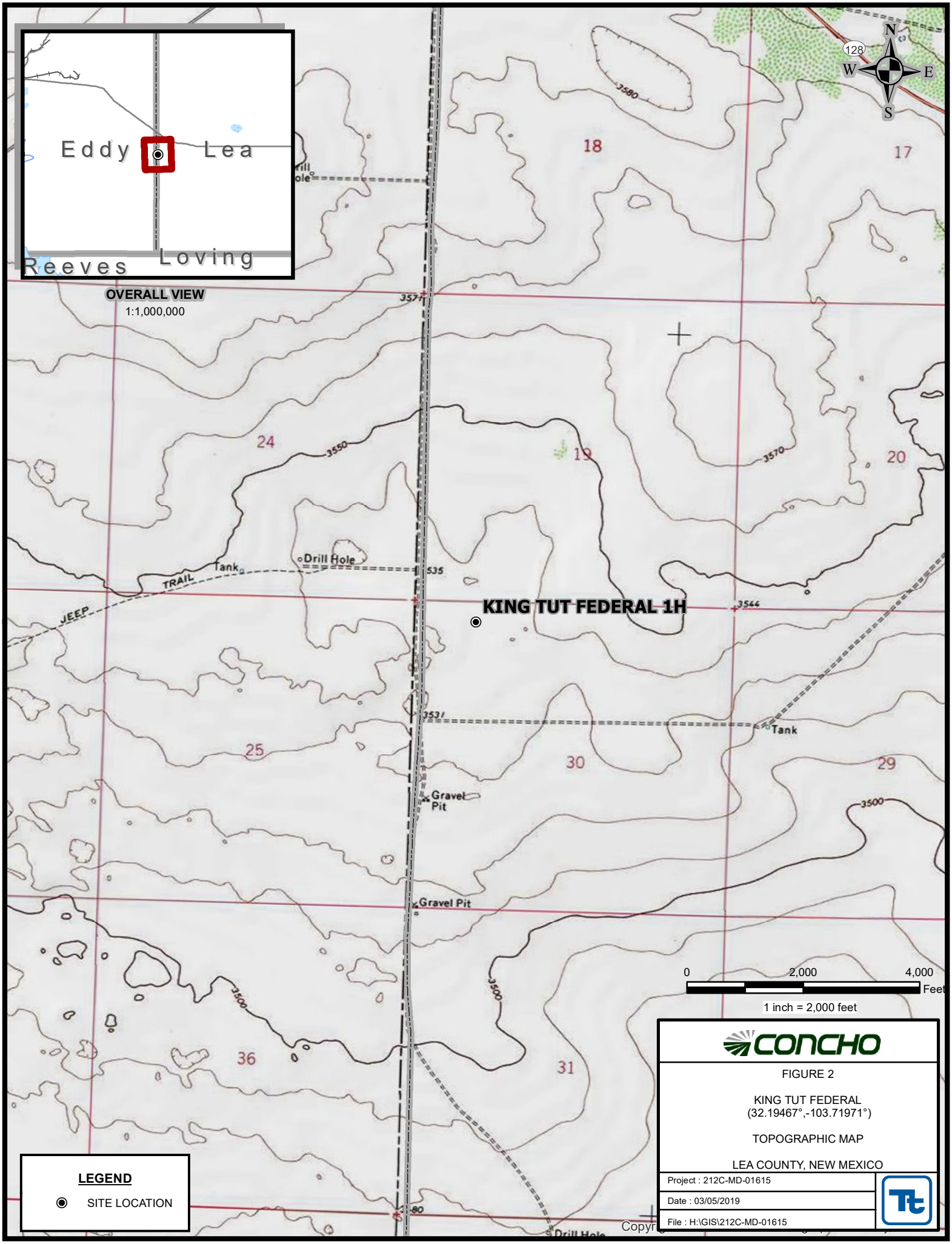
KING TUT FEDERAL
(32.19467°,-103.71971°)

OVERVIEW MAP

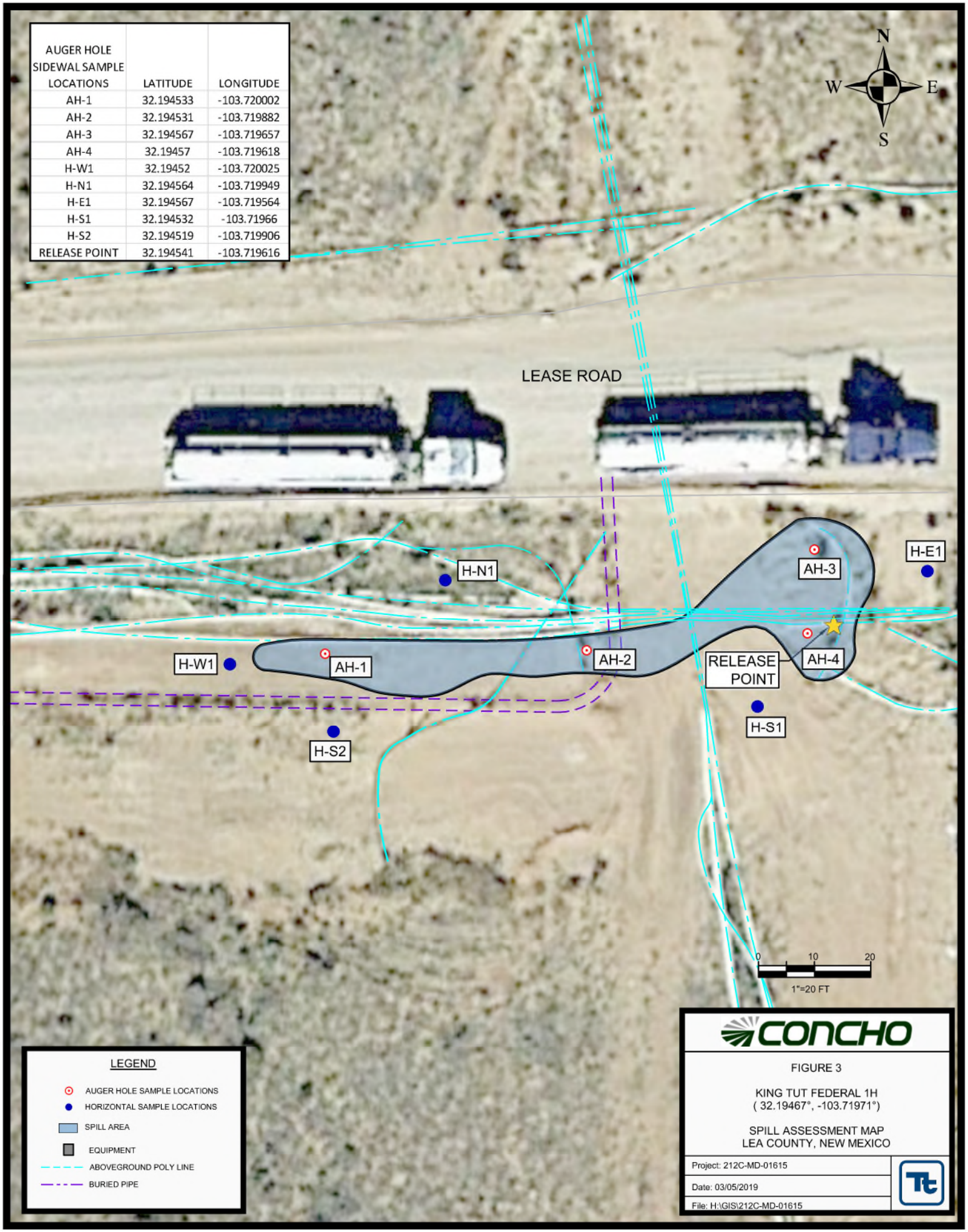
LEA COUNTY, NEW MEXICO

Project : 212C-MD-01615	
Date : 03/05/2019	
File : H:\GIS\212C-MD-01615	

MAPPED BY: MISTI MORGAN



MAPPED BY: MISTI MORGAN



Drawn By: MISTI MORGAN

Photos

COG
King Tut Federal #1H
Lea County, New Mexico

Area of AH-1 – View Northwest

Area of AH-2 – View West

COG
King Tut Federal #1H
Lea County, New Mexico

Area of AH-3 – View East

Area of AH-4 – View West

Tables

Table 1
COG
King Tut (2.8.19)
Lea County, New Mexico

Sample ID	Sample Date	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						
AH-1	2/20/2019	0-1	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	8,060
	"	1-1.5	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	5,990
	"	2-2.5	X		-	-	-	-	-	-	-	-	-	-	5,930
	"	3-3.5	X		-	-	-	-	-	-	-	-	-	-	3,140
	"	4-4.5	X		-	-	-	-	-	-	-	-	-	-	1,580
	"	5-5.5	X		-	-	-	-	-	-	-	-	-	-	1,610
	"	6-6.5	X		-	-	-	-	-	-	-	-	-	-	1,740
	"	7-7.5	X		-	-	-	-	-	-	-	-	-	-	3,550
	"	8-8.5	X		-	-	-	-	-	-	-	-	-	-	4,160
	"	9-9.5	X		-	-	-	-	-	-	-	-	-	-	1,130
	"	10	X		-		-	-	-	-	-	-	-	-	1,350
AH-2	2/20/2019	0-1	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	2,860
	"	1-1.5	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	790
	"	2-2.5	X		-	-	-	-	-	-	-	-	-	-	1,780
	"	3-3.5	X		-	-	-	-	-	-	-	-	-	-	2,780
	"	4-4.5	X		-	-	-	-	-	-	-	-	-	-	4,170
	"	5-5.5	X		-	-	-	-	-	-	-	-	-	-	4,570
	"	6-6.5	X		-	-	-	-	-	-	-	-	-	-	1,990
	"	7-7.5	X		-	-	-	-	-	-	-	-	-	-	1,690
	"	8-8.5	X		-	-	-	-	-	-	-	-	-	-	1,410
	"	9-9.5	X		-	-	-	-	-	-	-	-	-	-	783
	"	10	X		-		-	-	-	-	-	-	-	-	612

Table 1
COG
King Tut (2.8.19)
Lea County, New Mexico

Sample ID	Sample Date	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						
AH-3	2/20/2019	0-1	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	13,500
	"	1-1.5	X		<14.9	<14.9	<14.9	<14.9	<14.9	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	15,100
	"	2-2.5	X		-	-	-	-	-	-	-	-	-	-	2,820
	"	3-3.5	X		-	-	-	-	-	-	-	-	-	-	593
	"	4-4.5	X		-	-	-	-	-	-	-	-	-	-	588
	"	5-5.5	X		-	-	-	-	-	-	-	-	-	-	413
	"	6-6.5	X		-	-	-	-	-	-	-	-	-	-	399
	"	7-7.5	X		-	-	-	-	-	-	-	-	-	-	3,630
	"	8-8.5	X		-	-	-	-	-	-	-	-	-	-	6,400
	"	9-9.5	X		-	-	-	-	-	-	-	-	-	-	8,440
	"	10	X		-		-	-	-	-	-	-	-	-	7,730
AH-4	2/20/2019	0-1	X		<14.9	<14.9	<14.9	<14.9	<14.9	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	8,600
	"	1-1.5	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	1,680
	"	2-2.5	X		-	-	-	-	-	-	-	-	-	-	284
	"	3-3.5	X		-	-	-	-	-	-	-	-	-	-	52.3
	"	4-4.5	X		-	-	-	-	-	-	-	-	-	-	14.5
	"	5-5.5	X		-	-	-	-	-	-	-	-	-	-	22.4
	"	6-6.5	X		-	-	-	-	-	-	-	-	-	-	99.6
	"	7-7.5	X		-	-	-	-	-	-	-	-	-	-	206
Horizontal North 1	2/20/2019	-	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	22.2
Horizontal West 1	2/20/2019	-	X		<14.9	<14.9	<14.9	<14.9	<14.9	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	25.6
Horizontal South 1	2/20/2019	-	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	8.43
Horizontal South 2	2/20/2019	-	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	0.0206	0.0129	0.0429	0.0764	8.03
Horizontal East 1	2/20/2019	-	X		<15.0	17.6	17.6	<15.0	17.6	<0.00200	0.00251	<0.00200	<0.00200	0.00251	254

(-) Not Analyzed

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	COG Production, LLC	OGRID	217955
Contact Name	Jennifer Knowlton	Contact Telephone	(575) 748-1570
Contact email	JKnowlton@concho.com	Incident # *(assigned by OCD)*	
Contact mailing address	600 West Illinois Avenue, Midland, Texas 79701		

Location of Release Source

Latitude 32.19467 Longitude -103.71971

(NAD 83 in decimal degrees to 5 decimal places)

Site Name	King Tut Federal #001H	Site Type	Flowline
Date Release Discovered	February 8, 2019	API# *(if applicable)*	

Unit Letter	Section	Township	Range	County
D	30	24S	32E	Lea

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

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
■ Produced Water	Volume Released (bbls) 10	Volume Recovered (bbls) 5
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	■ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

The release was caused by the SWD being closed in resulting in the flowline to rupture. The flowline is being repaired. The release occurred in the pasture. A vacuum truck was dispatched to remove all freestanding fluids.
Concho will evaluate the site to determine if we may commence remediation immediately or delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ■ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

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

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

If all the actions described above have 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: DeAnn Grant Title: HSE Administrative Assistant

Signature: DeAnn Grant Date: 2/11/2019

email: agrant@concho.com Telephone: (432) 253-4513

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	290 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☑ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☑ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☑ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☑ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☑ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☑ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☑ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☑ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☑ No

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

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

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

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

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: Ike Tavarez Title: Senior HSE Supervisor

Signature: Date: 3/27/19

email: itavarez@concho.com Telephone: 432-685-2573

OCD Only

Received by: Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

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

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

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

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

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

☐ Description of remediation activities

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

Printed Name: Ike Tavarez Title: Senior HSE Supervisor

Signature: _____ Date: 3/27/19

email: itavarez@concho.com Telephone: 432-685-2573

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - King Tut Federal #1H

23 South 31 East

6 85	5 354	4 168	3	2	1
7 140	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

23 South 32 East

6	5	4	3	2	1
7 639	8	9	10	11	12
18	17	16	15	14	13
19	20 713	21 400	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

23 South 33 East

6	5	4	3	2	1
7 475	8	9	10	11	12 325
18	17	16	15	14	13
19 400	20 400	21	22	23	24
30	29	28 400	27	26 225	25 225
31	32	33	34	35	36

24 South 31 East

6	5	4	3	2 160	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

24 South 32 East

6	5 380	4	3	2	1
7	8	9	10 20	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33 290	34	35	36

24 South 33 East

6	5	4	3	2	1
7	8	9	10 24.6	11	12
18	17	16	15	14	13
19	20	21	22	23 208	24 16.9
30	29	28	27	26	25
31	32	33 93.2	34	35	36

25 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 390 290	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 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	32 290	33	34	35	36

25 South 33 East

6	5	4	3 172	2	1
7	8	9	10	11 140	12 200
18	17	16	15	14	13
19	20 200	21 120	22	23	24
30	29	28	27 125	26	25
31 257	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

121 Abandoned Waterwell (recently measured)

National Water Information System: Web Interface

Click to hideNews Bulletins

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

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

site_no list =

- 321005103402301

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

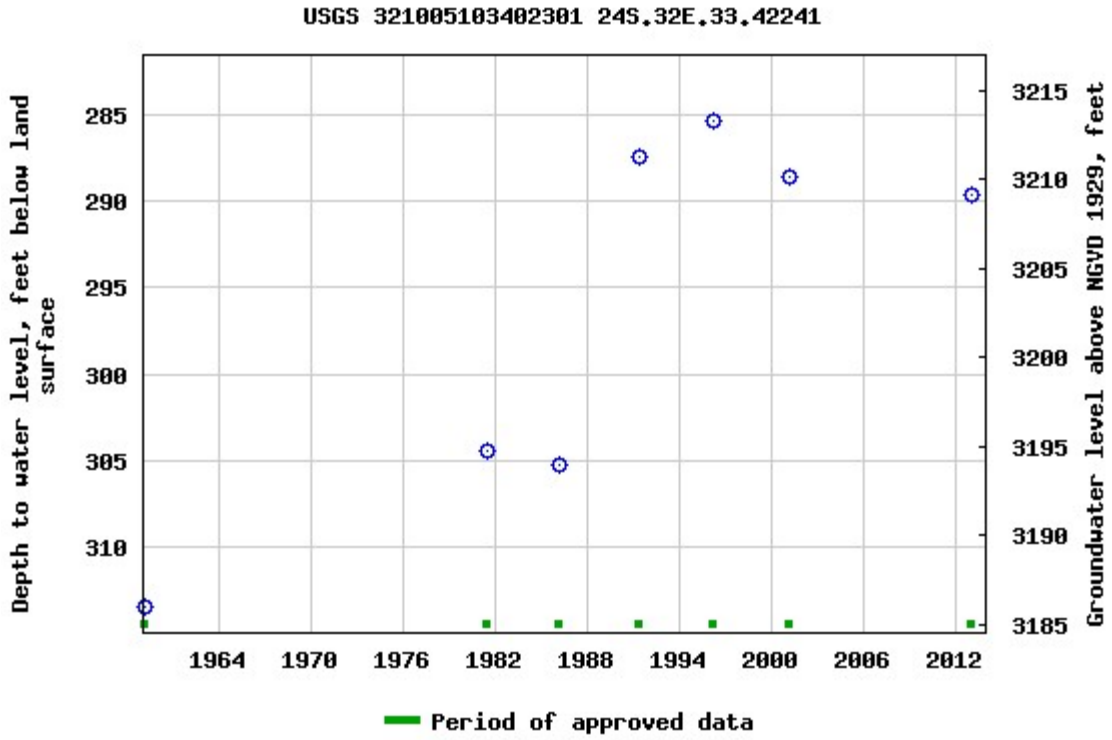
USGS 321005103402301 24S.32E.33.42241

Available data for this site Groundwater: Field measurements GO

Lea County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°10'21.6", Longitude 103°40'18.9" NAD83
Land-surface elevation 3,499.00 feet above NGVD29
The depth of the well is 367 feet below land surface.
This well is completed in the Chinle Formation (231CHNL) local aquifer.

Output formats

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



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

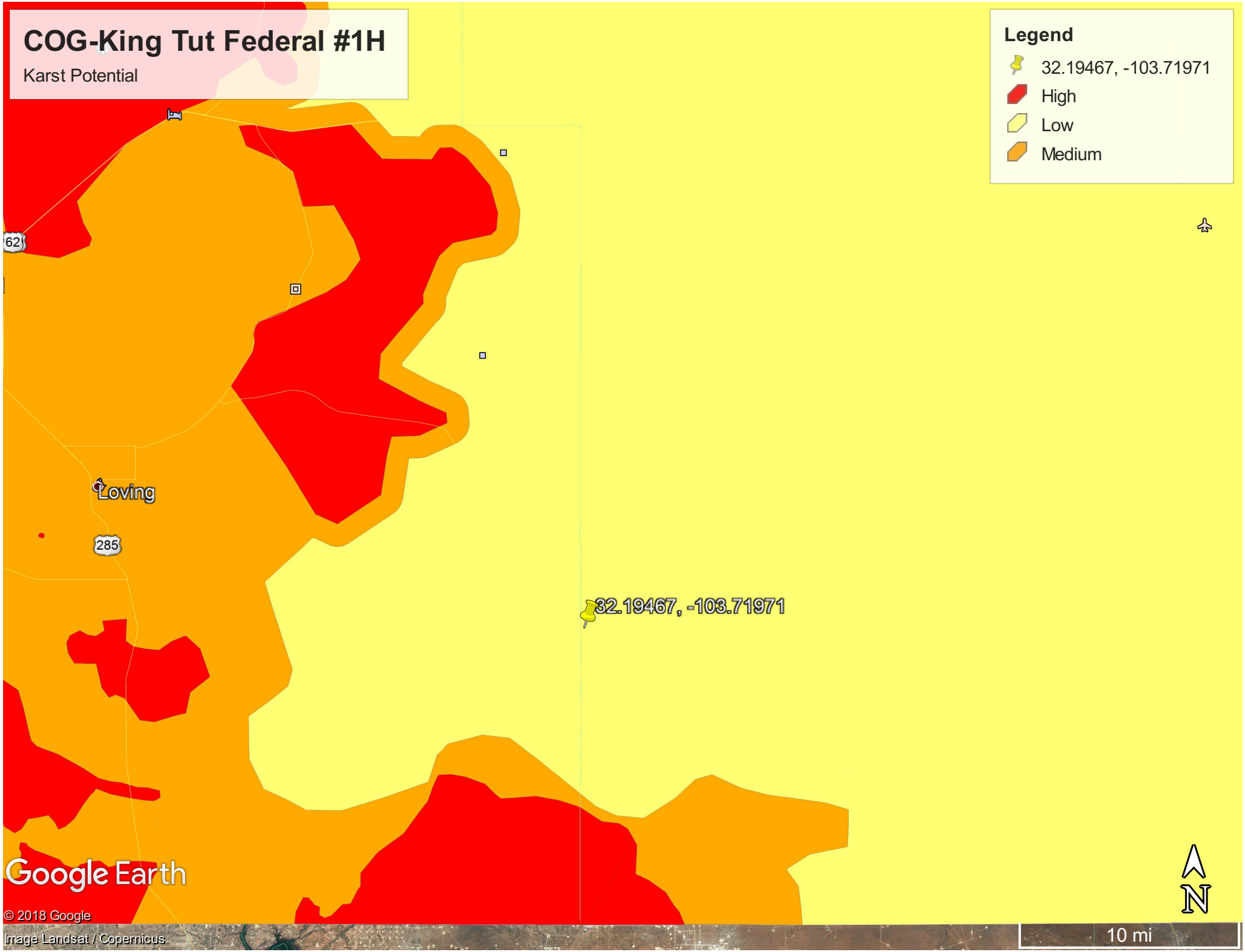
Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Accessibility Plug-Ins FOIA Privacy Policies and Notices

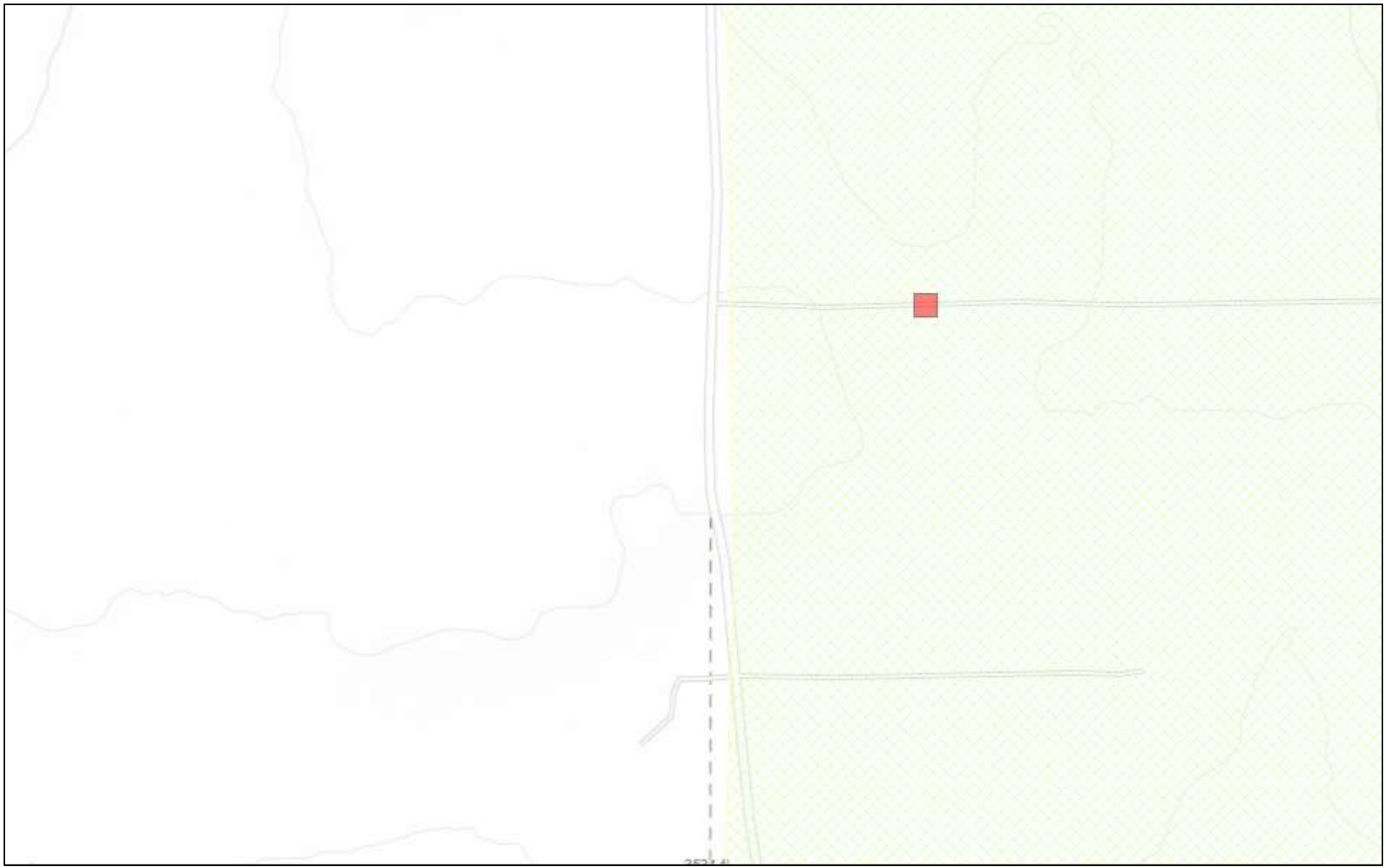
U.S. Department of the Interior | U.S. Geological Survey

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: 2019-02-28 12:11:21 EST
33.71 1.31 nadww01


COG-King Tut Federal #1H
Karst Potential
Legend
32.19467, -103.71971
High
Low
Medium
62
Loving
285
32.19467, -103.71971
Google Earth
© 2018 Google
Image Landsat / Copernicus
N
10 mi

New Mexico NFHL Data



February 28, 2019

1:9,028

0 0.075 0.15 0.3 mi

0 0.1 0.2 0.4 km

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

Appendix C

Analytical Report 615247

for

Tetra Tech- Midland

Project Manager: Clair Gonzales

King Tut (2.8.19)

212C-MD-01615

06-MAR-19

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

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

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

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429), North Carolina (483)
Xenco-Lakeland: Florida (E84098)

06-MAR-19

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

Reference: XENCO Report No(s): **615247**
King Tut (2.8.19)
Project Address: Lea Co, NM

Clair Gonzales:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 615247. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 615247 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Jessica Kramer
Project Assistant

Sample Cross Reference 615247

Tetra Tech- Midland, Midland, TX

King Tut (2.8.19)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH #1 (0-1')	S	02-20-19 00:00		615247-001
AH #1 (1-1.5')	S	02-20-19 00:00		615247-002
AH #1 (2-2.5')	S	02-20-19 00:00		615247-003
AH #1 (3-3.5')	S	02-20-19 00:00		615247-004
AH #1 (4-4.5')	S	02-20-19 00:00		615247-005
AH #1 (5-5.5')	S	02-20-19 00:00		615247-006
AH #1 (6-6.5')	S	02-20-19 00:00		615247-007
AH #1 (7-7.5')	S	02-20-19 00:00		615247-008
AH #1 (8-8.5')	S	02-20-19 00:00		615247-009
AH #1 (9-9.5')	S	02-20-19 00:00		615247-010
AH #1 (10')	S	02-20-19 00:00		615247-011
AH #2 (0-1')	S	02-20-19 00:00		615247-012
AH #2 (1-1.5')	S	02-20-19 00:00		615247-013
AH #2 (2-2.5')	S	02-20-19 00:00		615247-014
AH #2 (3-3.5')	S	02-20-19 00:00		615247-015
AH #2 (4-4.5')	S	02-20-19 00:00		615247-016
AH #5 (5.5.5')	S	02-20-19 00:00		615247-017
AH #2 (6-6.5')	S	02-20-19 00:00		615247-018
AH #2 (7-7.5')	S	02-20-19 00:00		615247-019
AH #2 (8-8.5')	S	02-20-19 00:00		615247-020
AH #2 (9-9.5')	S	02-20-19 00:00		615247-021
AH #2 (10')	S	02-20-19 00:00		615247-022
AH #3 (0-1')	S	02-20-19 00:00		615247-023
AH #3 (1-1.5')	S	02-20-19 00:00		615247-024
AH #3 (2-2.5')	S	02-20-19 00:00		615247-025
AH #3 (3-3.5')	S	02-20-19 00:00		615247-026
AH #3 (4-4.5')	S	02-20-19 00:00		615247-027
AH #3 (5-5.5')	S	02-20-19 00:00		615247-028
AH #3 (6-6.5')	S	02-20-19 00:00		615247-029
AH #3 (7-7.5')	S	02-20-19 00:00		615247-030
AH #3 (8-8.5')	S	02-20-19 00:00		615247-031
AH #3 (9-9.5')	S	02-20-19 00:00		615247-032
AH #3 (10')	S	02-20-19 00:00		615247-033
AH #4 (0-1')	S	02-20-19 00:00		615247-034
AH #4 (1-1.5')	S	02-20-19 00:00		615247-035
AH #4 (2-2.5')	S	02-20-19 00:00		615247-036
AH #4 (3-3.5')	S	02-20-19 00:00		615247-037
AH #4 (4-4.5')	S	02-20-19 00:00		615247-038
AH #4 (5-5.5')	S	02-20-19 00:00		615247-039
AH #4 (6-6.5')	S	02-20-19 00:00		615247-040
AH #4 (7-7.5')	S	02-20-19 00:00		615247-041
Horizontal North 1	S	02-20-19 00:00		615247-042
Horizontal West 1	S	02-20-19 00:00		615247-043

Sample Cross Reference 615247

Tetra Tech- Midland, Midland, TX

King Tut (2.8.19)

Horizontal South 1	S	02-20-19 00:00	615247-044
Horizontal South 2	S	02-20-19 00:00	615247-045
Horizontal East 1	S	02-20-19 00:00	615247-046

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3080065 Chloride by EPA 300
Lab Sample ID 615247-013 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 615247-002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020, -021.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3080080 Chloride by EPA 300
Lab Sample ID 615247-039 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 615247-029, -030, -031, -032, -033, -034, -035, -036, -037, -038, -039, -040, -041, -042, -043, -044, -045, -046.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3080242 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3081216 BTEX by EPA 8021B
Surrogate 1,4-Difluorobenzene recovered above QC limits. Matrix interferences is suspected. Samples affected are: 615247-045.
Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected. Samples affected are: 615247-045,615247-044.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-001		615247-002		615247-003		615247-004		615247-005		615247-006	
	Field Id:	AH #1 (0-1')		AH #1 (1-1.5')		AH #1 (2-2.5')		AH #1 (3-3.5')		AH #1 (4-4.5')		AH #1 (5-5.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***	Feb-25-19 08:00		Feb-25-19 08:00									
	Analyzed:	Feb-25-19 10:47		Feb-25-19 15:48									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Benzene		<0.00200	0.00200	<0.00201	0.00201								
Toluene		<0.00200	0.00200	<0.00201	0.00201								
Ethylbenzene		<0.00200	0.00200	<0.00201	0.00201								
m,p-Xylenes		<0.00400	0.00400	<0.00402	0.00402								
o-Xylene		<0.00200	0.00200	<0.00201	0.00201								
Total Xylenes		<0.00200	0.00200	<0.00201	0.00201								
Total BTEX		<0.00200	0.00200	<0.00201	0.00201								
Chloride by EPA 300	***Extracted:***	Feb-21-19 16:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00	
	Analyzed:	Feb-22-19 06:08		Feb-21-19 17:18		Feb-21-19 17:47		Feb-21-19 17:57		Feb-21-19 18:06		Feb-21-19 18:16	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		8060	49.8	5990	50.0	5930	49.8	3140	25.0	1580	24.8	1610	24.9
TPH by SW8015 Mod	***Extracted:***	Feb-22-19 07:00		Feb-22-19 07:00									
	Analyzed:	Feb-22-19 14:55		Feb-22-19 15:14									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0								
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0								
Motor Oil Range Hydrocarbons (MRO)		<15.0	15.0	<15.0	15.0								
Total TPH		<15.0	15.0	<15.0	15.0								

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-007		615247-008		615247-009		615247-010		615247-011		615247-012	
	Field Id:	AH #1 (6-6.5')		AH #1 (7-7.5')		AH #1 (8-8.5')		AH #1 (9-9.5')		AH #1 (10')		AH #2 (0-1')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***											Feb-25-19 08:00	
	Analyzed:											Feb-25-19 16:07	
	Units/RL:											mg/kg	RL
Benzene												<0.00199	0.00199
Toluene												<0.00199	0.00199
Ethylbenzene												<0.00199	0.00199
m,p-Xylenes												<0.00398	0.00398
o-Xylene												<0.00199	0.00199
Total Xylenes												<0.00199	0.00199
Total BTEX												<0.00199	0.00199
Chloride by EPA 300	***Extracted:***	Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00	
	Analyzed:	Feb-21-19 18:45		Feb-21-19 18:55		Feb-21-19 19:04		Feb-21-19 19:14		Feb-21-19 19:23		Feb-21-19 20:02	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1740	25.0	3550	25.0	4160	24.9	1130	4.95	1350	24.8	2860	24.8
TPH by SW8015 Mod	***Extracted:***											Feb-22-19 07:00	
	Analyzed:											Feb-22-19 15:34	
	Units/RL:											mg/kg	RL
Gasoline Range Hydrocarbons (GRO)												<15.0	15.0
Diesel Range Organics (DRO)												<15.0	15.0
Motor Oil Range Hydrocarbons (MRO)												<15.0	15.0
Total TPH												<15.0	15.0

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-013		615247-014		615247-015		615247-016		615247-017		615247-018	
	Field Id:	AH #2 (1-1.5')		AH #2 (2-2.5')		AH #2 (3-3.5')		AH #2 (4-4.5')		AH #5 (5.5.5')		AH #2 (6-6.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***	Feb-25-19 08:00											
	Analyzed:	Feb-25-19 16:26											
	Units/RL:	mg/kg	RL										
Benzene		<0.00200	0.00200										
Toluene		<0.00200	0.00200										
Ethylbenzene		<0.00200	0.00200										
m,p-Xylenes		<0.00400	0.00400										
o-Xylene		<0.00200	0.00200										
Total Xylenes		<0.00200	0.00200										
Total BTEX		<0.00200	0.00200										
Chloride by EPA 300	***Extracted:***	Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00	
	Analyzed:	Feb-21-19 19:33		Feb-21-19 20:12		Feb-21-19 20:41		Feb-21-19 20:50		Feb-21-19 21:00		Feb-21-19 21:10	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		790	4.95	1780	24.8	2780	25.2	4170	25.0	4570	25.0	1990	25.0
TPH by SW8015 Mod	***Extracted:***	Feb-22-19 07:00											
	Analyzed:	Feb-22-19 15:54											
	Units/RL:	mg/kg	RL										
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0										
Diesel Range Organics (DRO)		<15.0	15.0										
Motor Oil Range Hydrocarbons (MRO)		<15.0	15.0										
Total TPH		<15.0	15.0										

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-019		615247-020		615247-021		615247-022		615247-023		615247-024	
	Field Id:	AH #2 (7-7.5')		AH #2 (8-8.5')		AH #2 (9-9.5')		AH #2 (10')		AH #3 (0-1')		AH #3 (1-1.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***									Feb-25-19 08:00		Feb-25-19 08:00	
	Analyzed:									Feb-25-19 16:45		Feb-25-19 17:04	
	Units/RL:									mg/kg	RL	mg/kg	RL
Benzene										<0.00200	0.00200	<0.00202	0.00202
Toluene										<0.00200	0.00200	<0.00202	0.00202
Ethylbenzene										<0.00200	0.00200	<0.00202	0.00202
m,p-Xylenes										<0.00401	0.00401	<0.00403	0.00403
o-Xylene										<0.00200	0.00200	<0.00202	0.00202
Total Xylenes										<0.00200	0.00200	<0.00202	0.00202
Total BTEX										<0.00200	0.00200	<0.00202	0.00202
Chloride by EPA 300	***Extracted:***	Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 15:00		Feb-21-19 16:00		Feb-21-19 16:00		Feb-21-19 16:00	
	Analyzed:	Feb-21-19 21:19		Feb-21-19 21:29		Feb-21-19 21:38		Feb-22-19 06:29		Feb-22-19 06:35		Feb-22-19 06:42	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1690	25.0	1410	4.98	783	4.99	612	4.98	13500	99.0	15100	99.0
TPH by SW8015 Mod	***Extracted:***									Feb-22-19 07:00		Feb-22-19 07:00	
	Analyzed:									Feb-22-19 16:13		Feb-22-19 16:32	
	Units/RL:									mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)										<15.0	15.0	<14.9	14.9
Diesel Range Organics (DRO)										<15.0	15.0	<14.9	14.9
Motor Oil Range Hydrocarbons (MRO)										<15.0	15.0	<14.9	14.9
Total TPH										<15.0	15.0	<14.9	14.9

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-025		615247-026		615247-027		615247-028		615247-029		615247-030	
	Field Id:	AH #3 (2-2.5')		AH #3 (3-3.5')		AH #3 (4-4.5')		AH #3 (5-5.5')		AH #3 (6-6.5')		AH #3 (7-7.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
Chloride by EPA 300	***Extracted:***	Feb-21-19 16:00		Feb-21-19 16:00		Feb-21-19 16:00		Feb-21-19 16:00		Feb-21-19 16:45		Feb-21-19 16:45	
	Analyzed:	Feb-22-19 06:48		Feb-22-19 06:54		Feb-22-19 07:00		Feb-22-19 07:06		Feb-21-19 22:36		Feb-21-19 23:05	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		2820	24.8	593	4.98	588	5.00	413	4.99	399	4.96	3630	24.9

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-031		615247-032		615247-033		615247-034		615247-035		615247-036	
	Field Id:	AH #3 (8-8.5')		AH #3 (9-9.5')		AH #3 (10')		AH #4 (0-1')		AH #4 (1-1.5')		AH #4 (2-2.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***							Feb-25-19 08:00		Feb-25-19 08:00			
	Analyzed:							Feb-25-19 17:23		Feb-25-19 17:42			
	Units/RL:							mg/kg	RL	mg/kg	RL		
Benzene								<0.00200	0.00200	<0.00199	0.00199		
Toluene								<0.00200	0.00200	<0.00199	0.00199		
Ethylbenzene								<0.00200	0.00200	<0.00199	0.00199		
m,p-Xylenes								<0.00399	0.00399	<0.00398	0.00398		
o-Xylene								<0.00200	0.00200	<0.00199	0.00199		
Total Xylenes								<0.00200	0.00200	<0.00199	0.00199		
Total BTEX								<0.00200	0.00200	<0.00199	0.00199		
Chloride by EPA 300	***Extracted:***	Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45	
	Analyzed:	Feb-21-19 23:15		Feb-21-19 23:24		Feb-21-19 23:53		Feb-22-19 00:03		Feb-22-19 00:13		Feb-22-19 00:22	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		6400	49.9	8440	49.7	7730	49.6	8600	50.0	1680	25.0	284	5.00
TPH by SW8015 Mod	***Extracted:***							Feb-22-19 07:00		Feb-22-19 07:00			
	Analyzed:							Feb-22-19 17:31		Feb-22-19 17:50			
	Units/RL:							mg/kg	RL	mg/kg	RL		
Gasoline Range Hydrocarbons (GRO)								<14.9	14.9	<15.0	15.0		
Diesel Range Organics (DRO)								<14.9	14.9	<15.0	15.0		
Motor Oil Range Hydrocarbons (MRO)								<14.9	14.9	<15.0	15.0		
Total TPH								<14.9	14.9	<15.0	15.0		

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-037		615247-038		615247-039		615247-040		615247-041		615247-042	
	Field Id:	AH #4 (3-3.5')		AH #4 (4-4.5')		AH #4 (5-5.5')		AH #4 (6-6.5')		AH #4 (7-7.5')		Horizontal North 1	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00	
BTEX by EPA 8021B	***Extracted:***											Mar-05-19 15:00	
	Analyzed:											Mar-06-19 04:25	
	Units/RL:											mg/kg	RL
Benzene												<0.00200	0.00200
Toluene												<0.00200	0.00200
Ethylbenzene												<0.00200	0.00200
m,p-Xylenes												<0.00399	0.00399
o-Xylene												<0.00200	0.00200
Total Xylenes												<0.00200	0.00200
Total BTEX												<0.00200	0.00200
Chloride by EPA 300	***Extracted:***	Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45	
	Analyzed:	Feb-22-19 00:32		Feb-22-19 00:42		Feb-22-19 00:51		Feb-22-19 01:20		Feb-22-19 01:49		Feb-22-19 01:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		52.3	5.00	14.5	5.00	22.4	4.99	99.6	4.95	206	5.00	22.2	4.98
TPH by SW8015 Mod	***Extracted:***											Mar-01-19 16:00	
	Analyzed:											Mar-01-19 23:26	
	Units/RL:											mg/kg	RL
Gasoline Range Hydrocarbons (GRO)												<15.0	15.0
Diesel Range Organics (DRO)												<15.0	15.0
Motor Oil Range Hydrocarbons (MRO)												<15.0	15.0
Total TPH												<15.0	15.0

Jessica Kramer
Project Assistant

Certificate of Analysis Summary 615247

Tetra Tech- Midland, Midland, TX

Project Name: King Tut (2.8.19)

Project Id: 212C-MD-01615
Contact: Clair Gonzales
Project Location: Lea Co, NM

Date Received in Lab: Thu Feb-21-19 09:22 am
Report Date: 06-MAR-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	615247-043		615247-044		615247-045		615247-046					
	Field Id:	Horizontal West 1		Horizontal South 1		Horizontal South 2		Horizontal East 1					
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00		Feb-20-19 00:00					
BTEX by EPA 8021B	***Extracted:***	Mar-05-19 15:00		Mar-05-19 15:00		Mar-05-19 15:00		Mar-05-19 15:00					
	Analyzed:	Mar-06-19 04:44		Mar-06-19 05:03		Mar-06-19 06:54		Mar-06-19 07:13					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Benzene		<0.00201	0.00201	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200				
Toluene		<0.00201	0.00201	<0.00200	0.00200	0.0206	0.00200	0.00251	0.00200				
Ethylbenzene		<0.00201	0.00201	<0.00200	0.00200	0.0129	0.00200	<0.00200	0.00200				
m,p-Xylenes		<0.00402	0.00402	<0.00400	0.00400	0.0275	0.00399	<0.00399	0.00399				
o-Xylene		<0.00201	0.00201	<0.00200	0.00200	0.0154	0.00200	<0.00200	0.00200				
Total Xylenes		<0.00201	0.00201	<0.00200	0.00200	0.0429	0.00200	<0.00200	0.00200				
Total BTEX		<0.00201	0.00201	<0.00200	0.00200	0.0764	0.00200	0.00251	0.00200				
Chloride by EPA 300	***Extracted:***	Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45		Feb-21-19 16:45					
	Analyzed:	Feb-22-19 02:08		Feb-22-19 02:18		Feb-22-19 02:28		Feb-22-19 02:37					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		25.6	4.99	8.43	4.96	8.03	4.98	254	4.99				
TPH by SW8015 Mod	***Extracted:***	Mar-01-19 16:00		Mar-01-19 16:00		Mar-01-19 16:00		Mar-01-19 16:00					
	Analyzed:	Mar-01-19 23:46		Mar-02-19 00:05		Mar-02-19 00:25		Mar-02-19 00:44					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)		<14.9	14.9	<15.0	15.0	<15.0	15.0	<15.0	15.0				
Diesel Range Organics (DRO)		<14.9	14.9	<15.0	15.0	<15.0	15.0	17.6	15.0				
Motor Oil Range Hydrocarbons (MRO)		<14.9	14.9	<15.0	15.0	<15.0	15.0	<15.0	15.0				
Total TPH		<14.9	14.9	<15.0	15.0	<15.0	15.0	17.6	15.0				

Jessica Kramer
Project Assistant

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080226 **Sample:** 615247-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 14:55

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.8	99.7	98	70-135	
o-Terphenyl	48.6	49.9	97	70-135	

Lab Batch #: 3080226 **Sample:** 615247-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 15:14

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.0	99.7	95	70-135	
o-Terphenyl	47.1	49.9	94	70-135	

Lab Batch #: 3080226 **Sample:** 615247-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 15:34

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.7	99.8	96	70-135	
o-Terphenyl	46.9	49.9	94	70-135	

Lab Batch #: 3080226 **Sample:** 615247-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 15:54

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.6	99.9	97	70-135	
o-Terphenyl	47.4	50.0	95	70-135	

Lab Batch #: 3080226 **Sample:** 615247-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 16:13

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.5	99.9	97	70-135	
o-Terphenyl	47.9	50.0	96	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080226 **Sample:** 615247-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 16:32

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.4	99.6	97	70-135	
o-Terphenyl	48.0	49.8	96	70-135	

Lab Batch #: 3080226 **Sample:** 615247-034 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 17:31

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.9	99.6	96	70-135	
o-Terphenyl	47.6	49.8	96	70-135	

Lab Batch #: 3080226 **Sample:** 615247-035 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 17:50

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.9	99.8	93	70-135	
o-Terphenyl	46.1	49.9	92	70-135	

Lab Batch #: 3080242 **Sample:** 615247-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 10:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0343	0.0300	114	70-130	
4-Bromofluorobenzene	0.0309	0.0300	103	70-130	

Lab Batch #: 3080242 **Sample:** 615247-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 15:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0341	0.0300	114	70-130	
4-Bromofluorobenzene	0.0338	0.0300	113	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080242 **Sample:** 615247-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 16:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0333	0.0300	111	70-130	
4-Bromofluorobenzene	0.0376	0.0300	125	70-130	

Lab Batch #: 3080242 **Sample:** 615247-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 16:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0347	0.0300	116	70-130	
4-Bromofluorobenzene	0.0345	0.0300	115	70-130	

Lab Batch #: 3080242 **Sample:** 615247-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 16:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0348	0.0300	116	70-130	
4-Bromofluorobenzene	0.0345	0.0300	115	70-130	

Lab Batch #: 3080242 **Sample:** 615247-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 17:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0346	0.0300	115	70-130	
4-Bromofluorobenzene	0.0341	0.0300	114	70-130	

Lab Batch #: 3080242 **Sample:** 615247-034 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 17:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0344	0.0300	115	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080242 **Sample:** 615247-035 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 17:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0343	0.0300	114	70-130	
4-Bromofluorobenzene	0.0336	0.0300	112	70-130	

Lab Batch #: 3080901 **Sample:** 615247-042 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/01/19 23:26

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.0	99.8	94	70-135	
o-Terphenyl	45.1	49.9	90	70-135	

Lab Batch #: 3080901 **Sample:** 615247-043 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/01/19 23:46

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.8	99.6	95	70-135	
o-Terphenyl	45.9	49.8	92	70-135	

Lab Batch #: 3080901 **Sample:** 615247-044 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/02/19 00:05

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.9	108	70-135	
o-Terphenyl	51.6	50.0	103	70-135	

Lab Batch #: 3080901 **Sample:** 615247-045 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/02/19 00:25

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.8	99.7	95	70-135	
o-Terphenyl	45.0	49.9	90	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080901 **Sample:** 615247-046 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/02/19 00:44

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.7	99.7	95	70-135	
o-Terphenyl	46.1	49.9	92	70-135	

Lab Batch #: 3081216 **Sample:** 615247-042 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 04:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0355	0.0300	118	70-130	
4-Bromofluorobenzene	0.0342	0.0300	114	70-130	

Lab Batch #: 3081216 **Sample:** 615247-043 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 04:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0357	0.0300	119	70-130	
4-Bromofluorobenzene	0.0344	0.0300	115	70-130	

Lab Batch #: 3081216 **Sample:** 615247-044 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 05:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0321	0.0300	107	70-130	
4-Bromofluorobenzene	0.0512	0.0300	171	70-130	**

Lab Batch #: 3081216 **Sample:** 615247-045 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 06:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0404	0.0300	135	70-130	**
4-Bromofluorobenzene	0.0536	0.0300	179	70-130	**

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3081216 **Sample:** 615247-046 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 07:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0330	0.0300	110	70-130	
4-Bromofluorobenzene	0.0385	0.0300	128	70-130	

Lab Batch #: 3080226 **Sample:** 7672373-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/22/19 11:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.4	100	98	70-135	
o-Terphenyl	50.3	50.0	101	70-135	

Lab Batch #: 3080242 **Sample:** 7672435-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/25/19 10:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0325	0.0300	108	70-130	
4-Bromofluorobenzene	0.0288	0.0300	96	70-130	

Lab Batch #: 3080901 **Sample:** 7672838-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/01/19 20:53

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	100	103	70-135	
o-Terphenyl	51.4	50.0	103	70-135	

Lab Batch #: 3081216 **Sample:** 7673026-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/06/19 02:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0348	0.0300	116	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247, **Project ID:** 212C-MD-01615

Lab Batch #: 3080226 **Sample:** 7672373-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/22/19 12:17

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	58.8	50.0	118	70-135	

Lab Batch #: 3080242 **Sample:** 7672435-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/25/19 08:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	70-130	
4-Bromofluorobenzene	0.0313	0.0300	104	70-130	

Lab Batch #: 3080901 **Sample:** 7672838-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/01/19 21:12

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	100	127	70-135	
o-Terphenyl	56.3	50.0	113	70-135	

Lab Batch #: 3081216 **Sample:** 7673026-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/06/19 00:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0334	0.0300	111	70-130	
4-Bromofluorobenzene	0.0298	0.0300	99	70-130	

Lab Batch #: 3080226 **Sample:** 7672373-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/22/19 12:36

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	100	129	70-135	
o-Terphenyl	62.5	50.0	125	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247,

Project ID: 212C-MD-01615

Lab Batch #: 3080242 **Sample:** 7672435-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 02/25/19 09:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	70-130	
4-Bromofluorobenzene	0.0290	0.0300	97	70-130	

Lab Batch #: 3080901 **Sample:** 7672838-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/01/19 21:31

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	56.1	50.0	112	70-135	

Lab Batch #: 3081216 **Sample:** 7673026-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/06/19 00:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0335	0.0300	112	70-130	
4-Bromofluorobenzene	0.0300	0.0300	100	70-130	

Lab Batch #: 3080226 **Sample:** 614862-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 13:16

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	125	100	125	70-135	
o-Terphenyl	59.3	50.0	119	70-135	

Lab Batch #: 3080242 **Sample:** 615247-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 09:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0333	0.0300	111	70-130	
4-Bromofluorobenzene	0.0307	0.0300	102	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247, **Project ID:** 212C-MD-01615

Lab Batch #: 3080901 **Sample:** 616046-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/01/19 22:09

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	99.8	127	70-135	
o-Terphenyl	59.6	49.9	119	70-135	

Lab Batch #: 3081216 **Sample:** 615920-006 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 01:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0339	0.0300	113	70-130	
4-Bromofluorobenzene	0.0311	0.0300	104	70-130	

Lab Batch #: 3080226 **Sample:** 614862-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/22/19 13:35

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	125	100	125	70-135	
o-Terphenyl	58.7	50.0	117	70-135	

Lab Batch #: 3080242 **Sample:** 615247-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 02/25/19 09:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0332	0.0300	111	70-130	
4-Bromofluorobenzene	0.0305	0.0300	102	70-130	

Lab Batch #: 3080901 **Sample:** 616046-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/01/19 22:28

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	99.9	126	70-135	
o-Terphenyl	51.9	50.0	104	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: King Tut (2.8.19)

Work Orders : 615247, **Project ID:** 212C-MD-01615

Lab Batch #: 3081216 **Sample:** 615920-006 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/06/19 01:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0344	0.0300	115	70-130	
4-Bromofluorobenzene	0.0307	0.0300	102	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

BS / BSD Recoveries

Project Name: King Tut (2.8.19)

Work Order #: 615247 **Project ID:** 212C-MD-01615

Analyst: SCM **Date Prepared:** 02/25/2019 **Date Analyzed:** 02/25/2019

Lab Batch ID: 3080242 **Sample:** 7672435-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000384	0.0998	0.108	108	0.100	0.105	105	3	70-130	35	
Toluene	<0.000455	0.0998	0.102	102	0.100	0.0917	92	11	70-130	35	
Ethylbenzene	<0.000564	0.0998	0.104	104	0.100	0.0868	87	18	70-130	35	
m,p-Xylenes	<0.00101	0.200	0.214	107	0.201	0.176	88	19	70-130	35	
o-Xylene	<0.000344	0.0998	0.105	105	0.100	0.0862	86	20	70-130	35	

Analyst: SCM **Date Prepared:** 03/05/2019 **Date Analyzed:** 03/06/2019

Lab Batch ID: 3081216 **Sample:** 7673026-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000383	0.0996	0.123	123	0.100	0.123	123	0	70-130	35	
Toluene	<0.000454	0.0996	0.102	102	0.100	0.102	102	0	70-130	35	
Ethylbenzene	<0.000563	0.0996	0.0947	95	0.100	0.0949	95	0	70-130	35	
m,p-Xylenes	<0.00101	0.199	0.192	96	0.200	0.193	97	1	70-130	35	
o-Xylene	<0.000343	0.0996	0.0940	94	0.100	0.0943	94	0	70-130	35	

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

BS / BSD Recoveries

Project Name: King Tut (2.8.19)

Work Order #: 615247 **Project ID:** 212C-MD-01615

Analyst: CHE **Date Prepared:** 02/21/2019 **Date Analyzed:** 02/21/2019

Lab Batch ID: 3080065 **Sample:** 7672294-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

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

Analyst: CHE **Date Prepared:** 02/21/2019 **Date Analyzed:** 02/22/2019

Lab Batch ID: 3080068 **Sample:** 7672297-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	247	99	0	90-110	20	

Analyst: CHE **Date Prepared:** 02/21/2019 **Date Analyzed:** 02/21/2019

Lab Batch ID: 3080080 **Sample:** 7672299-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	264	106	250	274	110	4	90-110	20	

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

BS / BSD Recoveries

Project Name: King Tut (2.8.19)

Work Order #: 615247 **Project ID:** 212C-MD-01615

Analyst: ARM **Date Prepared:** 02/22/2019 **Date Analyzed:** 02/22/2019

Lab Batch ID: 3080226 **Sample:** 7672373-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	930	93	1000	991	99	6	70-135	20	
Diesel Range Organics (DRO)	<8.13	1000	927	93	1000	980	98	6	70-135	20	

Analyst: ARM **Date Prepared:** 03/01/2019 **Date Analyzed:** 03/01/2019

Lab Batch ID: 3080901 **Sample:** 7672838-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	1000	100	1000	977	98	2	70-135	20	
Diesel Range Organics (DRO)	<8.13	1000	1060	106	1000	1030	103	3	70-135	20	

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

Form 3 - MS / MSD Recoveries

Project Name: King Tut (2.8.19)

Work Order # : 615247 **Project ID:** 212C-MD-01615

Lab Batch ID: 3080242 **QC- Sample ID:** 615247-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/25/2019 **Date Prepared:** 02/25/2019 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000383	0.0994	0.106	107	0.100	0.117	117	10	70-130	35	
Toluene	<0.000453	0.0994	0.0918	92	0.100	0.100	100	9	70-130	35	
Ethylbenzene	<0.000561	0.0994	0.0871	88	0.100	0.0951	95	9	70-130	35	
m,p-Xylenes	<0.00101	0.199	0.177	89	0.200	0.191	96	8	70-130	35	
o-Xylene	<0.000342	0.0994	0.0865	87	0.100	0.0940	94	8	70-130	35	

Lab Batch ID: 3081216 **QC- Sample ID:** 615920-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/06/2019 **Date Prepared:** 03/05/2019 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000386	0.100	0.111	111	0.100	0.109	109	2	70-130	35	
Toluene	0.00152	0.100	0.0925	91	0.100	0.0899	88	3	70-130	35	
Ethylbenzene	<0.000567	0.100	0.0857	86	0.100	0.0827	83	4	70-130	35	
m,p-Xylenes	<0.00102	0.201	0.174	87	0.200	0.168	84	4	70-130	35	
o-Xylene	<0.000346	0.100	0.0850	85	0.100	0.0827	83	3	70-130	35	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: King Tut (2.8.19)

Work Order # : 615247 **Project ID:** 212C-MD-01615

Lab Batch ID: 3080065 **QC- Sample ID:** 615247-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/21/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	5990	250	8430	NC	250	8420	NC	0	90-110	20	X

Lab Batch ID: 3080065 **QC- Sample ID:** 615247-013 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/21/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	790	248	1030	97	248	1020	93	1	90-110	20	

Lab Batch ID: 3080068 **QC- Sample ID:** 615248-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/22/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	172	250	436	106	250	441	108	1	90-110	20	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: King Tut (2.8.19)

Work Order # : 615247 **Project ID:** 212C-MD-01615

Lab Batch ID: 3080068 **QC- Sample ID:** 615288-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/22/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<0.858	250	276	110	250	273	109	1	90-110	20	

Lab Batch ID: 3080080 **QC- Sample ID:** 615247-029 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/21/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	399	248	683	115	248	672	110	2	90-110	20	X

Lab Batch ID: 3080080 **QC- Sample ID:** 615247-039 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/22/2019 **Date Prepared:** 02/21/2019 **Analyst:** CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	22.4	250	293	108	250	289	107	1	90-110	20	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: King Tut (2.8.19)

Work Order # : 615247 **Project ID:** 212C-MD-01615

Lab Batch ID: 3080226 **QC- Sample ID:** 614862-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 02/22/2019 **Date Prepared:** 02/22/2019 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	970	97	1000	951	95	2	70-135	20	
Diesel Range Organics (DRO)	<8.13	1000	988	99	1000	986	99	0	70-135	20	

Lab Batch ID: 3080901 **QC- Sample ID:** 616046-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/01/2019 **Date Prepared:** 03/01/2019 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<7.99	998	927	93	999	928	93	0	70-135	20	
Diesel Range Organics (DRO)	8.55	998	964	96	999	972	96	1	70-135	20	

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

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

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

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

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

Analysis Request of Chain of Custody Record

615247

Page 1 of 5

Tetra Tech, Inc.

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

Client Name: COG	**Site Manager:** Clair Gonzales
Project Name: King Tut (2.8.19)	
Project Location: (county, state) Lea Co, NM	**Project #:** 212C-MD-01615
Invoice to: COG - Ike Taverez	
Receiving Laboratory: Xenco	**Sampler Signature:** Conner Moehring

Comments: Run deeper samples if TPH (GRO + DRO + MRO) exceeds 2,500 mg/kg or (GRO + DRO) exceeds 1,000 mg/kg. Run deeper samples if benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2018 DATE	TIME	MATRIX WATER	SOIL		PRESERVATIVE METHOD HCL	HNO_3	ICE	None		# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	AH #1 (0-1')	2/20/2019			X				X			1	N	X		X												X						
	AH #1 (1-1.5')	2/20/2019			X				X			1	N	X		X												X						
	AH #1 (2-2.5')	2/20/2019			X				X			1	N															X						
	AH #1 (3-3.5')	2/20/2019			X				X			1	N															X						
	AH #1 (4-4.5')	2/20/2019			X				X			1	N															X						
	AH #1 (5-5.5')	2/20/2019			X				X			1	N															X						
	AH #1 (6-6.5')	2/20/2019			X				X			1	N															X						
	AH #1 (7-7.5')	2/20/2019			X				X			1	N															X						
	AH #1 (8-8.5')	2/20/2019			X				X			1	N															X						
	AH #1 (9-9.5')	2/20/2019			X				X			1	N															X						

Relinquished by: Mike Conner	Date: 2-21-19	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

Received by: Date: 2/21/19 Time: 0922

LAB USE ONLY

Sample Temperature
3.5 | 3.4
-0.1 | 1.8

REMARKS:

- STANDARD
- [X] RUSH: Same Day 24 hr 48 hr (72 hr)
- [ ] Rush Charges Authorized
- [ ] Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

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Analysis Request of Chain of Custody Record

615247

Tetra Tech, Inc.

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

Client Name: COG	**Site Manager:** Clair Gonzales
Project Name: King Tut (2.8.19)	
Project Location: (county, state) Lea Co, NM	**Project #:** 212C-MD-01615
Invoice to: COG - Ike Taverez	
Receiving Laboratory: Xenco	**Sampler Signature:** Conner Moehring

Comments: Run deeper samples if TPH (GRO + DRO + MRO) exceeds 2,500 mg/kg or (GRO + DRO) exceeds 1,000 mg/kg. Run deeper samples if benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2018 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	AH #1 (10')	2/20/2019			X				X			1	N																X						
	AH #2 (0-1')	2/20/2019			X				X			1	N	X		X													X						
	AH #2 (1-1.5')	2/20/2019			X				X			1	N	X		X													X						
	AH #2 (2-2.5')	2/20/2019			X				X			1	N																X						
	AH #2 (3-3.5')	2/20/2019			X				X			1	N																X						
	AH #2 (4-4.5')	2/20/2019			X				X			1	N																X						
	AH #2 (5-5.5')	2/20/2019			X				X			1	N																X						
	AH #2 (6-6.5')	2/20/2019			X				X			1	N																X						
	AH #2 (7-7.5')	2/20/2019			X				X			1	N																X						
	AH #2 (8-8.5')	2/20/2019			X				X			1	N																X						

Relinquished by: Conner Moehring 2-21-19	Date:	Time:	Received by: Brad 2/21/19 0122
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB USE ONLY
Sample Temperature
35/34
-0.1 18

REMARKS:
STANDARD
[X] RUSH: Same Day 24 hr 48 hr (72 hr)
[ ] Rush Charges Authorized
[ ] Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

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Analysis Request of Chain of Custody Record

615247

Tetra Tech, Inc.

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

Client Name: COG
Site Manager: Clair Gonzales
Project Name: King Tut (2.8.19)
Project Location: (county, state) Lea Co, NM
Project #: 212C-MD-01615
Invoice to: COG - Ike Taverez
Receiving Laboratory: Xenco
Sampler Signature: Conner Moehring
Comments: Run deeper samples if TPH (GRO + DRO + MRO) exceeds 2,500 mg/kg or (GRO + DRO) exceeds 1,000 mg/kg. Run deeper samples if benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE (YEAR: 2018)	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	HNO_3	ICE	None	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
	AH #2 (9-9.5')	2/20/2019			X			X		1	N															X				
	AH #2 (10')	2/20/2019			X			X		1	N															X				
	AH #3 (0-1')	2/20/2019			X			X		1	N	X		X												X				
	AH #3 (1-1.5')	2/20/2019			X			X		1	N	X		X												X				
	AH #3 (2-2.5')	2/20/2019			X			X		1	N															X				
	AH #3 (3-3.5')	2/20/2019			X			X		1	N															X				
	AH #3 (4-4.5')	2/20/2019			X			X		1	N															X				
	AH #3 (5-5.5')	2/20/2019			X			X		1	N															X				
	AH #3 (6-6.5')	2/20/2019			X			X		1	N															X				
	AH #3 (7-7.5')	2/20/2019			X			X		1	N															X				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Mike Carmona	2-21-19		B. Hall	2/21/19	0922
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY
Sample Temperature
3.5/3.4
-0.1 KW

REMARKS:
[ ] STANDARD
[X] RUSH: Same Day 24 hr 48 hr 72 hr (circled)
[ ] Rush Charges Authorized
[ ] Special Report Limits or TRRP Report

(Circle) HAND DELIVERED (circled) FEDEX UPS Tracking #: ______

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Analysis Request of Chain of Custody Record

615247

Tetra Tech, Inc.

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

Client Name: COG
Site Manager: Clair Gonzales
Project Name: King Tut (2.8.19)
Project Location: (county, state) Lea Co, NM
Project #: 212C-MD-01615
Invoice to: COG - Ike Taverez
Receiving Laboratory: Xenco
Sampler Signature: Conner Moehring
Comments: Run deeper samples if TPH (GRO + DRO + MRO) exceeds 2,500 mg/kg or (GRO + DRO) exceeds 1,000 mg/kg. Run deeper samples if benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE (YEAR: 2018)	TIME	WATER	SOIL	HCL	HNO_3	ICE	None	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
	AH #3 (8-8.5')	2/20/2019			X			X		1	N															X				
	AH #3 (9-9.5')	2/20/2019			X			X		1	N															X				
	AH #3 (10')	2/20/2019			X			X		1	N															X				
	AH #4 (0-1')	2/20/2019			X			X		1	N	X		X												X				
	AH #4 (1-1.5')	2/20/2019			X			X		1	N	X		X												X				
	AH #4 (2-2.5')	2/20/2019			X			X		1	N															X				
	AH #4 (3-3.5')	2/20/2019			X			X		1	N															X				
	AH #4 (4-4.5')	2/20/2019			X			X		1	N															X				
	AH #4 (5-5.5')	2/20/2019			X			X		1	N															X				
	AH #4 (6-6.5')	2/20/2019			X			X		1	N															X				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Mike C [signature]	2-21-19		BSR [signature]	2/21/19	0930
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY
Sample Temperature
3.5/3.4
-0.1 R8

REMARKS:
☐ STANDARD
☒ RUSH: Same Day 24 hr 48 hr (72 hr)
☐ Rush Charges Authorized
☐ Special Report Limits or TRRP Report

(Circle) (HAND DELIVERED) FEDEX UPS Tracking #: ______

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Analysis Request of Chain of Custody Record

615247

Tetra Tech, Inc.

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

Client Name: COG
Site Manager: Clair Gonzales
Project Name: King Tut (2.8.19)
Project Location: (county, state) Lea Co, NM
Project #: 212C-MD-01615
Invoice to: COG - Ike Taverez
Receiving Laboratory: Xenco
Sampler Signature: Conner Moehring
Comments: Run deeper samples if TPH (GRO + DRO + MRO) exceeds 2,500 mg/kg or (GRO + DRO) exceeds 1,000 mg/kg. Run deeper samples if benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING (YEAR: 2018) DATE	TIME	MATRIX WATER	SOIL		PRESERVATIVE METHOD HCL	HNO_3	ICE	None		# CONTAINERS	FILTERED (Y/N)
	AH #4 (7-7.5')	2/20/2019			X				X			1	N
	Horizontal North 1	2/20/2019			X				X			1	N
	Horizontal West 1	2/20/2019			X				X			1	N
	Horizontal South 1	2/20/2019			X				X			1	N
	Horizontal South 2	2/20/2019			X				X			1	N
	Horizontal East 1	2/20/2019			X				X			1	N

ANALYSIS REQUEST (Circle or Specify Method No.)

SAMPLE IDENTIFICATION	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
AH #4 (7-7.5')															X				
Horizontal North 1															X				
Horizontal West 1															X				
Horizontal South 1															X				
Horizontal South 2															X				
Horizontal East 1															X				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	2-21-19		[signature]	2/21/19	0922
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY
Sample Temperature: 3.5/3.4 -0.1 I18

REMARKS:
- ☐ STANDARD
- ☒ RUSH: Same Day 24 hr 48 hr (72 hr)
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) (HAND DELIVERED) FEDEX UPS Tracking #: ______

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XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 02/21/2019 09:22:00 AM

Work Order #: 615247

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.4
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**N/A**
#18 Water VOC samples have zero headspace?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 02/21/2019
Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 02/21/2019
Jessica Kramer