

SITE INFORMATION

Report Type: Work Plan 2RP-4246

General Site Information:

Site:	Michalada Federal #3D					
Company:	COG Operating LLC					
Section, Township and Range	Unit B	Sec. 03	T 22S	R 25E		
Lease Number:	API No. 30-015-35157					
County:	Eddy County					
GPS:	32.4255753° N			104.3826447° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of NM 524 and Jones St, travel west on Jones Rd for approx. 4.3 miles, turn north onto lease road for 1.1 miles, turn north onto lease road for 2.10 mi to location					

Release Data:

Date Released:	6/9/2017
Type Release:	Produced Water
Source of Contamination:	Tank
Fluid Released:	6 bbls
Fluids Recovered:	2 bbls

Official Communication:

Name:	Robert McNeil		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	rmcneil@conchoresources.com		Ike.Tavarez@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	100'-125'
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:		0

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	5,000

April 16, 2018

Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

Re: Work Plan for the COG Operating LLC., Michalada Federal #3D, Unit B, Section 03, Township 22 South, Range 25 East, Eddy County, New Mexico. 2RP-4246.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess and evaluate a release that occurred at Michalada Federal #3D, Unit B, Section 03, Township 22 South, Range 25 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.4255753°, W 104.3826447°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on June 9, 2017, and released approximately six (6) barrels of produced water due to a suspected bullet hole in the water tank. A vacuum truck was used to remove all freestanding fluids, recovering approximately two (2) barrels of produced water. All of the fluids remained inside the unlined berm and impacted an area measuring approximately 6' x 15'. The Initial C-141 Form is included in Appendix A.

Groundwater

No wells are listed within Section 6 in the New Mexico Office of the State Engineers database, the USGS National Water Information System, or the Geology and Groundwater Resources of Eddy County, NM (Report 3). The nearest well listed is located in Section 33, Township 21 South, Range 25 East, approximately 1.20 miles northwest of the site, and shows a depth to groundwater of 60' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 100' and 125' below surface. The groundwater data is shown in Appendix B.

Tetra Tech

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

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com

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, dated August 13, 1993. 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 depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

Hand Auger

On August 23, 2017, Tetra Tech personnel were onsite to evaluate and sample the release area. One (1) auger hole (AH-1) was installed inside the release footprint to a total depth of 1.0' below surface. Deeper samples were not collected due to a dense formation in the area. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The auger hole location is shown on Figure 3. The sampling results are summarized in Table 1.

Referring to Table 1, the area of auger hole (AH-1) showed a benzene concentration below the laboratory reporting limits and a total BTEX concentration below the RRAL of 1.17 mg/kg. Additionally, a total TPH concentration of 4,960 mg/kg was detected at 0-1' below surface. The area of auger hole (AH-1) showed an elevated chloride concentration of 2,940 mg/kg at 0-1'.

Borehole Installation

Based on the laboratory results, Tetra Tech returned to the site on December 13, 2017 to install a borehole (BH-1) to the vertically define extents. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The borehole location is shown on Figure 3. The sampling results are summarized in Table 1.

Referring to Table 1, none of the borehole samples showed benzene concentrations above the RRAL. However, the total BTEX concentration spiked at 4-5.0' below surface to 787 mg/kg, before declining with depth to 5.05 mg/kg at 6.0'-7.0' and 0.0947 mg/kg at 9.0'-10' below surface. In addition, the total TPH concentrations were below the RRALs, with a TPH high of 1,090 mg/kg at 4-5.0' below surface. A chloride high of 4,460 mg/kg was detected at 0-1', which declined with depth to 1,630 mg/kg at 2-3.0' and 66.5 mg/kg at 4-5.0', and showed a bottom hole concentration of 408 mg/kg at 9-10' below surface.

Work Plan

The lithology in the area of borehole (BH-1) consisted of sand, limestone and chert in the upper soils to an approximate depth of 2-3.0' and is underlain by a sandy clay to a depth of approximately 4-5.0' below surface. The lithology of the deeper soils consists of primarily a dense limestone encountered below the clay layer. The elevated total BTEX concentration detected at 4-5.0' below surface appears to be limited and confined on the top of the clay formation (thin layer), which is preventing further vertical migration. The limited impact does not appear to be an environmental concern.

Based on the laboratory results and investigation, COG proposes to excavate the area of borehole (BH-1) to approximately 2-3.0' below surface, as practicable due to the tanks, lines and the dense formation in the area. Once the excavation is complete, the areas will then be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns for onsite personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.

Conclusion

Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH



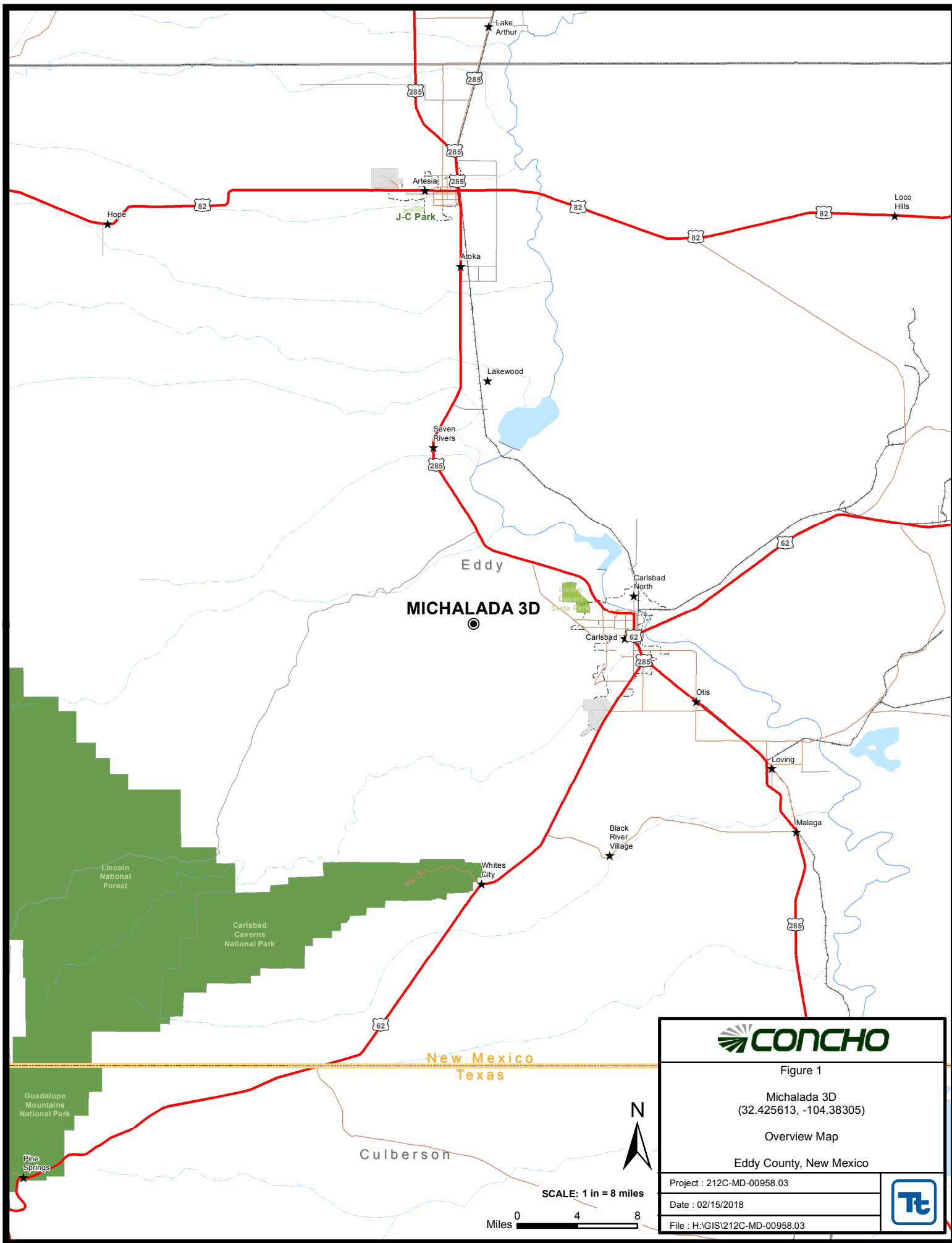
Clair Gonzales,
Project Manager



Ike Tavarez,
Senior Project Manager, P.G.

cc: Robert McNeill – COG
Dakota Neel – COG
Rebecca Haskell – COG
Crystal Weaver - NMOCD
Shelly Tucker - BLM

Figures





SPILL AREA
6'x15'

Above Ground Line
Above Ground Line

BH-1 AH-1

EXPLANATION




-  AUGER HOLE SAMPLE LOCATIONS
-  BOREHOLE SAMPLE LOCATIONS
-  SPILL AREA



Figure 3

Michalada 3D
(32.425613, -104.38305)

Spill Assessment Map

Eddy County, New Mexico

Project : 212C-MD-00958.03

Date : 02/15/2018

File : H:\GIS\212C-MD-00958.03





Tables

Table 1
COG Operating LLC.
Michalada Federal #3D
Eddy 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	C6-C10	C10-C28	C28-C35	Total						
AH-1	8/23/2017	0-1	X		704	3,800	459	4,960	<0.00200	0.1570	0.0991	0.911	1.170	2,940
BH-1	12/13/2017	0-1	X		16.5	115	<15.0	132	<0.00200	<0.00200	<0.00200	0.018	0.0178	4,460
	"	2-3	X		218	466	26.0	710	<0.00201	0.0653	0.159	0.983	1.21	1,630
	"	4-5	X		555	509	24.7	1,090	0.0445	50.8	97.3	639	787	66.5
	"	6-7	X		-	-	-	-	<0.0101	0.0225	0.497	4.53	5.05	370
	"	9-10	X		-	-	-	-	<0.0101	<0.0101	<0.0101	0.0947	0.0947	408



Proposed Excavation Depths

(-)

Not Analyzed

Photos



View North – Release Area



View Northwest – Release Area



View Southeast – Release Area



View North – Area of BH-1

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC OGRID # 229137	Contact: Robert McNeill	
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443	
Facility Name: Michalada Federal #003D	Facility Type: Tank Battery	
Surface Owner: Federal	Mineral Owner: Federal	API No. 30-015-35157

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	03	22S	25E	990	North	2287	East	Eddy

Latitude 32.4255753 Longitude -104.3826447

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 6 bbls	Volume Recovered: 2 bbls
Source of Release: Tank	Date and Hour of Occurrence: June 9, 2017 6:30 am	Date and Hour of Discovery: June 9, 2017 6:30 am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was due to suspected bullet hole in the tank. The tank was repaired.

Describe Area Affected and Cleanup Action Taken.*

The release was within an unlined berm. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to 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.

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

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION		
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:		
Title: Senior HSE Coordinator	Approval Date:	Expiration Date:	
E-mail Address: rhaskell@concho.com	Conditions of Approval:		Attached <input type="checkbox"/>
Date: June 12, 2017 Phone: 432-683-7443			

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG Michalada Federal #3D
Eddy County, New Mexico

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

21 South			25 East		
6	5	4	3	65	2
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	90
31	32	33	60	34	35

21 South			26 East		
6	5	65	4	3	140
7	8	9	150	10	120
18	17	16	139	15	93
19	20	21	70	22	55
30	29	28	75	27	40
31	200	32	45	34	90

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

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

22 South			26 East		
6	5	4	68	3	140
7	8	9	73	10	95
18	17	16	15	14	68
19	20	21	22	23	78
30	29	28	140	27	96
31	105	32	33	34	150

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

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

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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
C 00959	C	ED		1	1	1	27	22S	25E	557349	3581495*			
C 00960	C	ED		3	1	2	28	22S	25E	556534	3581303*	69	52	17
C 00961	C	ED		4	1	2	19	22S	25E	553461	3582890*	80	60	20
C 00988	C	ED				4	01	22S	25E	561503	3586854*	55	20	35
C 01288	C	ED			1	4	20	22S	25E	554996	3582193*	800		
C 01492	C	ED		1	2	4	30	22S	25E	553689	3580659*			
C 01738	C	ED		4	2	3	16	22S	25E	556273	3583728*	204		
C 01758	C	ED		4	2	3	16	22S	25E	556273	3583728*			
C 01856	C	ED				4	09	22S	25E	556774	3585236*	460		
C 02362		ED		1	3	3	29	22S	25E	554108	3580247*	83	60	23
C 02874	C	ED		4	3	2	11	22S	25E	559796	3585738*	740	385	355
C 03552 POD1	C	ED		4	4	2	15	22S	25E	558548	3584192	250	150	100

Average Depth to Water: **121 feet**

Minimum Depth: **20 feet**

Maximum Depth: **385 feet**

Record Count: 12

PLSS Search:

Township: 22S **Range:** 25E

*UTM location was derived from PLSS - see Help

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

2/14/18 8:55 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
C 00107		CUB	ED	4	3	3	09	21S	25E	555822	3594647*	300		
C 00384		C	ED	1	4	1	17	21S	25E	554431	3593935	994	220	774
C 00384 CLW201180	O		ED	3	2	1	17	21S	25E	554411	3594236*	994	220	774
C 00384 CLW201207	O		ED	3	2	1	17	21S	25E	554411	3594236*	994	220	774
C 00550		C	ED	1	1	2	11	21S	25E	559689	3596136*	97		
C 00885		C	ED	3	4	2	05	21S	25E	555204	3597091*	348		
C 00885 POD2		C	ED	3	4	2	05	21S	25E	555204	3597091*	379	348	31
C 01041		C	ED	3	3	3	03	21S	25E	557260	3596343*	85	65	20
C 01166		C	ED		1	3	11	21S	25E	558976	3595176*	550		
C 01399		C	LE	3	3	2	15	21S	25E	558068	3593839*	200		
C 01451		C	ED		3	3	22	21S	25E	557373	3591507*	290	260	30
C 01455		C	ED		3	2	26	21S	25E	559780	3590713*	125	90	35
C 01456	R	C	ED		2	2	33	21S	25E	557012	3589339	60	17	43
C 01456 POD2		C	ED	4	2	2	33	21S	25E	557012	3589339	80	60	20
C 01470		C	ED		2	4	06	21S	25E	553698	3596774*	284	264	20
C 02066		C	ED	3	3	3	04	21S	25E	555616	3596280*	120	97	23
C 02268			ED	1	4	3	11	21S	25E	559277	3594853*	30	25	5
C 02643		C	ED		3	3	03	21S	25E	557361	3596444*	145	33	112
C 02731		C	ED	1	3	4	18	21S	25E	553218	3593208*	233	60	173
C 03618 POD1		C	ED	2	2	1	03	21S	25E	557943	3597754	160	80	80

Average Depth to Water: **137 feet**

Minimum Depth: **17 feet**

Maximum Depth: **348 feet**

Record Count: 20

PLSS Search:

Township: 21S **Range:** 25E

*UTM location was derived from PLSS - see Help

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

2/14/18 9:24 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

Analytical Report 561388

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

COG- Michalda Federal #3D

212C-MD-00958

31-AUG-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



31-AUG-17

Project Manager: **Ike Tavaréz**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **561388**
COG- Michalda Federal #3D
Project Address: Eddy County, New Mexico

Ike Tavaréz:

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) 561388. 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. 561388 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,

Kelsey Brooks

Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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



Sample Cross Reference 561388



Tetra Tech- Midland, Midland, TX

COG- Michalda Federal #3D

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH#1 (0-1')	S	08-23-17 00:00		561388-001



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: COG- Michalda Federal #3D

Project ID: 212C-MD-00958
Work Order Number(s): 561388

Report Date: 31-AUG-17
Date Received: 08/25/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3026156 BTEX by EPA 8021B

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



Certificate of Analysis Summary 561388

Tetra Tech- Midland, Midland, TX

Project Name: COG- Michalda Federal #3D



Project Id: 212C-MD-00958
Contact: Ike Tavarez
Project Location: Eddy County, New Mexico

Date Received in Lab: Fri Aug-25-17 12:30 pm
Report Date: 31-AUG-17
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id: Field Id: Depth: Matrix: Sampled:	561388-001 AH#1 (0-1') SOIL Aug-23-17 00:00					
BTEX by EPA 8021B	Extracted: Analyzed: Units/RL:	Aug-28-17 16:00 Aug-29-17 08:05 mg/kg RL					
Benzene		<0.00200 0.00200					
Toluene		0.157 0.00200					
Ethylbenzene		0.0991 0.00200					
m,p-Xylenes		0.664 0.00399					
o-Xylene		0.247 0.00200					
Total Xylenes		0.911 0.00200					
Total BTEX		1.17 0.00200					
Inorganic Anions by EPA 300/300.1	Extracted: Analyzed: Units/RL:	Aug-29-17 16:15 Aug-30-17 00:48 mg/kg RL					
Chloride		2940 24.7					
TPH By SW8015 Mod	Extracted: Analyzed: Units/RL:	Aug-28-17 16:00 Aug-29-17 06:02 mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		704 15.0					
Diesel Range Organics (DRO)		3800 15.0					
Oil Range Hydrocarbons (ORO)		459 15.0					
Total TPH		4960 15.0					

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Kelsey Brooks
Project Manager

- 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 **SQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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 5332 Blackberry Drive, San Antonio TX 78238
 1211 W Florida Ave, Midland, TX 79701
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(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: COG- Michalda Federal #3D

Work Orders : 561388,

Project ID: 212C-MD-00958

Lab Batch #: 3026146

Sample: 561388-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 06:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.8	102	70-135	
o-Terphenyl	47.7	49.9	96	70-135	

Lab Batch #: 3026156

Sample: 561388-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 08:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0337	0.0300	112	80-120	

Lab Batch #: 3026156

Sample: 730048-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 22:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3026156

Sample: 730045-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 01:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.4	100	93	70-135	
o-Terphenyl	47.5	50.0	95	70-135	

Lab Batch #: 3026156

Sample: 730048-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 20:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0274	0.0300	91	80-120	

* 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: COG- Michalda Federal #3D

Work Orders : 561388,

Lab Batch #: 3026146

Sample: 730045-1-BKS / BKS

Project ID: 212C-MD-00958

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 02:12

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	91.6	100	92	70-135	
o-Terphenyl	44.5	50.0	89	70-135	

Lab Batch #: 3026156

Sample: 730048-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 20:47

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0260	0.0300	87	80-120	

Lab Batch #: 3026146

Sample: 730045-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 02:33

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	99.6	100	100	70-135	
o-Terphenyl	50.1	50.0	100	70-135	

Lab Batch #: 3026156

Sample: 561227-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/28/17 21:06

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3026146

Sample: 561389-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 03:14

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	111	99.8	111	70-135	
o-Terphenyl	49.3	49.9	99	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: COG- Michalda Federal #3D

Work Orders : 561388,

Lab Batch #: 3026156

Sample: 561227-001 SD / MSD

Project ID: 212C-MD-00958

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/28/17 21:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

Lab Batch #: 3026146

Sample: 561389-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 03:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.4	99.8	89	70-135	
o-Terphenyl	41.0	49.9	82	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



BS / BSD Recoveries



Project Name: COG- Michalda Federal #3D

Work Order #: 561388

Project ID: 212C-MD-00958

Analyst: ALJ

Date Prepared: 08/28/2017

Date Analyzed: 08/28/2017

Lab Batch ID: 3026156

Sample: 730048-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	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
Analytes											
Benzene	<0.00199	0.0994	0.116	117	0.100	0.119	119	3	70-130	35	
Toluene	<0.00199	0.0994	0.113	114	0.100	0.115	115	2	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.112	113	0.100	0.114	114	2	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.220	111	0.200	0.225	113	2	70-135	35	
o-Xylene	<0.00199	0.0994	0.106	107	0.100	0.109	109	3	71-133	35	

Analyst: MNV

Date Prepared: 08/29/2017

Date Analyzed: 08/29/2017

Lab Batch ID: 3026248

Sample: 730075-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	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
Analytes											
Chloride	<5.00	250	247	99	250	247	99	0	90-110	20	

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

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: COG- Michalda Federal #3D

Work Order #: 561388

Project ID: 212C-MD-00958

Analyst: ARM

Date Prepared: 08/28/2017

Date Analyzed: 08/29/2017

Lab Batch ID: 3026146

Sample: 730045-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	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
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	898	90	1000	952	95	6	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	967	97	1000	1020	102	5	70-135	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



Form 3 - MS / MSD Recoveries



Project Name: COG- Michalda Federal #3D

Work Order #: 561388

Project ID: 212C-MD-00958

Lab Batch ID: 3026156

QC- Sample ID: 561227-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/28/2017

Date Prepared: 08/28/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.100	99	0.101	0.0962	95	4	70-130	35	
Toluene	<0.00202	0.101	0.0908	90	0.101	0.0865	86	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0785	78	0.101	0.0805	80	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.151	75	0.202	0.154	76	2	70-135	35	
o-Xylene	<0.00202	0.101	0.0750	74	0.101	0.0786	78	5	71-133	35	

Lab Batch ID: 3026248

QC- Sample ID: 560863-007 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/29/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	998	247	1220	90	247	1200	82	2	90-110	20	X

Lab Batch ID: 3026248

QC- Sample ID: 561383-021 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/29/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1290	245	1560	110	245	1560	110	0	90-110	20	

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

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

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: COG- Michalda Federal #3D

Work Order #: 561388

Project ID: 212C-MD-00958

Lab Batch ID: 3026146

QC- Sample ID: 561389-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/28/2017

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)	<15.0	998	1050	105	998	893	89	16	70-135	35	
Diesel Range Organics (DRO)	99.9	998	1120	102	998	988	89	13	70-135	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.

Page 1 of 1



561388

ORIGINAL COPY

Temp. 38 IB ID: B-8

26



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 08/25/2017 12:30:00 PM

Work Order #: 561388

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)?	3.6
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	No
#21 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:

Shawnee Smith

Date: 08/28/2017

Checklist reviewed by:

Kelsey Brooks

Date: 08/29/2017

Analytical Report 571334

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

Michalada 3D

212C-MD-00958.03

04-JAN-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)

Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



04-JAN-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **571334**

Michalada 3D

Project Address: Eddy Co, NM

Ike Tavaréz:

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) 571334. 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. 571334 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,

Kelsey Brooks

Project Manager

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Sample Cross Reference 571334



Tetra Tech- Midland, Midland, TX

Michalada 3D

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH-1 0-1	S	12-13-17 00:00		571334-001
BH-1 2-3	S	12-13-17 00:00		571334-002
BH-1 4-5	S	12-13-17 00:00		571334-003
BH-1 6-7	S	12-13-17 00:00		571334-004
BH-1 9-10	S	12-13-17 00:00		571334-005
BH-1 14-15	S	12-13-17 00:00		Not Analyzed
BH-1 19-20	S	12-13-17 00:00		Not Analyzed
BH-1 24-25	S	12-13-17 00:00		Not Analyzed
BH-1 29-30	S	12-13-17 00:00		Not Analyzed



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Michalada 3D

Project ID: 212C-MD-00958.03
Work Order Number(s): 571334

Report Date: 04-JAN-18
Date Received: 12/15/2017

Sample receipt non conformances and comments:

01/02/18: added Btex to samples BH-1 @ 6-7 AND 9-10' per Clair Gonzales.

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3036930 BTEX by EPA 8021B

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

Surrogate 1,4-Difluorobenzene, Surrogate 4-Bromofluorobenzene recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 571334-003.

Batch: LBA-3037056 BTEX by EPA 8021B

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

Batch: LBA-3037292 BTEX by EPA 8021B

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



Certificate of Analysis Summary 571334

Tetra Tech- Midland, Midland, TX

Project Name: Michalada 3D



Project Id: 212C-MD-00958.03

Contact: Ike Tavarez

Project Location: Eddy Co, NM

Date Received in Lab: Fri Dec-15-17 01:00 pm

Report Date: 04-JAN-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571334-001	571334-002	571334-003	571334-004	571334-005		
	<i>Field Id:</i>	BH-1 0-1	BH-1 2-3	BH-1 4-5	BH-1 6-7	BH-1 9-10		
	<i>Depth:</i>							
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL		
	<i>Sampled:</i>	Dec-13-17 00:00	Dec-13-17 00:00	Dec-13-17 00:00	Dec-13-17 00:00	Dec-13-17 00:00		
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-26-17 10:00	Dec-26-17 10:00	Dec-26-17 16:00	Jan-02-18 10:30	Jan-02-18 10:30		
	<i>Analyzed:</i>	Dec-26-17 16:14	Dec-26-17 16:33	Dec-27-17 06:48	Jan-02-18 18:16	Jan-02-18 15:33		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Benzene		<0.00200 0.00200	<0.00201 0.00201	0.0445 0.00200	<0.0101 0.0101	<0.0101 0.0101		
Toluene		<0.00200 0.00200	0.0653 0.00201	50.8 D 2.50	0.0225 K 0.0101	<0.0101 0.0101		
Ethylbenzene		<0.00200 0.00200	0.159 0.00201	97.3 D 2.50	0.497 K 0.0101	<0.0101 0.0101		
m,p-Xylenes		0.0113 0.00399	0.745 0.00402	508 D 5.00	3.34 K 0.0202	0.0691 K 0.0201		
o-Xylene		0.00646 0.00200	0.238 0.00201	131 D 2.50	1.19 K 0.0101	0.0256 K 0.0101		
Total Xylenes		0.0178 0.00200	0.983 0.00201	639 2.50	4.53 K 0.0101	0.0947 K 0.0101		
Total BTEX		0.0178 0.00200	1.21 0.00201	787 0.00200	5.05 K 0.0101	0.0947 K 0.0101		
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Dec-20-17 08:30	Dec-20-17 08:30	Dec-20-17 08:30	Dec-20-17 08:30	Dec-20-17 08:30		
	<i>Analyzed:</i>	Dec-20-17 13:29	Dec-20-17 13:36	Dec-20-17 13:43	Dec-20-17 13:50	Dec-20-17 13:57		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		4460 49.8	1630 24.8	66.5 4.96	370 4.95	408 4.95		
TPH By SW8015 Mod	<i>Extracted:</i>	Dec-26-17 12:00	Dec-26-17 12:00	Dec-26-17 12:00				
	<i>Analyzed:</i>	Dec-26-17 21:31	Dec-26-17 21:51	Dec-26-17 22:10				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		16.5 15.0	218 15.0	555 15.0				
Diesel Range Organics (DRO)		115 15.0	466 15.0	509 15.0				
Oil Range Hydrocarbons (ORO)		<15.0 15.0	26.0 15.0	24.7 15.0				
Total TPH		132 15.0	710 15.0	1090 15.0				

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Kelsey Brooks
Project Manager

- 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

+ NELAC certification not offered for this compound.

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

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(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: Michalada 3D

Work Orders : 571334,

Project ID: 212C-MD-00958.03

Lab Batch #: 3037056

Sample: 571334-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 16:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 3037056

Sample: 571334-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 16:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3036940

Sample: 571334-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 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	77.3	100	77	70-135	
o-Terphenyl	40.9	50.0	82	70-135	

Lab Batch #: 3036940

Sample: 571334-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 21:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	78.9	100	79	70-135	
o-Terphenyl	41.3	50.0	83	70-135	

Lab Batch #: 3036940

Sample: 571334-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 22:10

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.8	100	86	70-135	
o-Terphenyl	42.7	50.0	85	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



Form 2 - Surrogate Recoveries

Project Name: Michalada 3D

Work Orders : 571334,

Lab Batch #: 3036930

Sample: 571334-003 / SMP

Project ID: 212C-MD-00958.03

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/27/17 06:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	<	0.0300	0	80-120	**
4-Bromofluorobenzene	<	0.0300	0	80-120	**

Lab Batch #: 3036930

Sample: 571334-003 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/27/17 16:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3037292

Sample: 571334-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 01/02/18 15:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0250	0.0300	83	80-120	

Lab Batch #: 3037292

Sample: 571334-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 01/02/18 18:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3037056

Sample: 7636696-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 10:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0243	0.0300	81	80-120	

* 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: Michalada 3D

Work Orders : 571334,

Project ID: 212C-MD-00958.03

Lab Batch #: 3036940

Sample: 7636626-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 13:19

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	79.4	100	79	70-135	
o-Terphenyl	39.1	50.0	78	70-135	

Lab Batch #: 3036930

Sample: 7636627-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/27/17 10:23

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0253	0.0300	84	80-120	

Lab Batch #: 3037292

Sample: 7636850-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 01/02/18 12:57

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

Lab Batch #: 3037056

Sample: 7636696-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 08:31

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0339	0.0300	113	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 3036940

Sample: 7636626-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 13:38

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	89.5	100	90	70-135	
o-Terphenyl	44.0	50.0	88	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



Form 2 - Surrogate Recoveries

Project Name: Michalada 3D

Work Orders : 571334,

Lab Batch #: 3036930

Sample: 7636627-1-BKS / BKS

Project ID: 212C-MD-00958.03

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/27/17 08:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0247	0.0300	82	80-120	

Lab Batch #: 3037292

Sample: 7636850-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 01/02/18 11:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0340	0.0300	113	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

Lab Batch #: 3037056

Sample: 7636696-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 08:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0341	0.0300	114	80-120	
4-Bromofluorobenzene	0.0339	0.0300	113	80-120	

Lab Batch #: 3036940

Sample: 7636626-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/26/17 13:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.1	100	84	70-135	
o-Terphenyl	45.7	50.0	91	70-135	

Lab Batch #: 3036930

Sample: 7636627-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/27/17 08:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

* 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: Michalada 3D

Work Orders : 571334,

Lab Batch #: 3037292

Sample: 7636850-1-BSD / BSD

Project ID: 212C-MD-00958.03

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 01/02/18 11:22

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	80-120	
4-Bromofluorobenzene	0.0337	0.0300	112	80-120	

Lab Batch #: 3037056

Sample: 572035-035 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 09:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3036940

Sample: 572053-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 14:40

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.5	100	91	70-135	
o-Terphenyl	39.0	50.0	78	70-135	

Lab Batch #: 3036930

Sample: 572053-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/27/17 09:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

Lab Batch #: 3037292

Sample: 572380-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 01/02/18 11:41

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	80-120	
4-Bromofluorobenzene	0.0339	0.0300	113	80-120	

* 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: Michalada 3D

Work Orders : 571334,

Lab Batch #: 3037056

Sample: 572035-035 SD / MSD

Project ID: 212C-MD-00958.03

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 09:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0287	0.0300	96	80-120	

Lab Batch #: 3036940

Sample: 572053-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/26/17 15:00

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	38.3	50.0	77	70-135	

Lab Batch #: 3036930

Sample: 572053-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/27/17 09:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0283	0.0300	94	80-120	

Lab Batch #: 3037292

Sample: 572380-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 01/02/18 12:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0345	0.0300	115	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

* 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: Michalada 3D

Work Order #: 571334

Project ID: 212C-MD-00958.03

Analyst: ALJ

Date Prepared: 12/26/2017

Date Analyzed: 12/27/2017

Lab Batch ID: 3036930

Sample: 7636627-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	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
Analytes											
Benzene	<0.00202	0.101	0.125	124	0.101	0.120	119	4	70-130	35	
Toluene	<0.00202	0.101	0.117	116	0.101	0.111	110	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.108	107	0.101	0.103	102	5	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.214	106	0.201	0.203	101	5	70-135	35	
o-Xylene	<0.00202	0.101	0.102	101	0.101	0.0959	95	6	71-133	35	

Analyst: ALJ

Date Prepared: 12/26/2017

Date Analyzed: 12/26/2017

Lab Batch ID: 3037056

Sample: 7636696-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	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
Analytes											
Benzene	<0.00199	0.0996	0.0748	75	0.100	0.0752	75	1	70-130	35	
Toluene	<0.00199	0.0996	0.0748	75	0.100	0.0765	77	2	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.0759	76	0.100	0.0777	78	2	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.161	81	0.201	0.160	80	1	70-135	35	
o-Xylene	<0.00199	0.0996	0.0773	78	0.100	0.0791	79	2	71-133	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: Michalada 3D

Work Order #: 571334

Project ID: 212C-MD-00958.03

Analyst: ALJ

Date Prepared: 01/02/2018

Date Analyzed: 01/02/2018

Lab Batch ID: 3037292

Sample: 7636850-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	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
Analytes											
Benzene	<0.00200	0.100	0.0777	78	0.101	0.0798	79	3	70-130	35	
Toluene	<0.00200	0.100	0.0771	77	0.101	0.0795	79	3	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0922	92	0.101	0.0944	93	2	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.180	90	0.201	0.185	92	3	70-135	35	
o-Xylene	<0.00200	0.100	0.0880	88	0.101	0.0899	89	2	71-133	35	

Analyst: LRI

Date Prepared: 12/20/2017

Date Analyzed: 12/20/2017

Lab Batch ID: 3036429

Sample: 7636277-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	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
Analytes											
Chloride	<5.00	250	259	104	250	262	105	1	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: Michalada 3D

Work Order #: 571334

Project ID: 212C-MD-00958.03

Analyst: JUM

Date Prepared: 12/26/2017

Date Analyzed: 12/26/2017

Lab Batch ID: 3036940

Sample: 7636626-1-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)	<15.0	1000	774	77	1000	804	80	4	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	796	80	1000	834	83	5	70-135	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



Form 3 - MS / MSD Recoveries



Project Name: Michalada 3D

Work Order #: 571334

Project ID: 212C-MD-00958.03

Lab Batch ID: 3036930

QC- Sample ID: 572053-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/27/2017

Date Prepared: 12/26/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0890	89	0.100	0.0935	94	5	70-130	35	
Toluene	<0.00200	0.100	0.0748	75	0.100	0.0837	84	11	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0562	56	0.100	0.0670	67	18	71-129	35	X
m,p-Xylenes	<0.00401	0.200	0.102	51	0.201	0.132	66	26	70-135	35	X
o-Xylene	0.00312	0.100	0.0664	63	0.100	0.0734	70	10	71-133	35	X

Lab Batch ID: 3037056

QC- Sample ID: 572035-035 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/26/2017

Date Prepared: 12/26/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0474	47	0.100	0.0528	53	11	70-130	35	X
Toluene	<0.00202	0.101	0.0426	42	0.100	0.0490	49	14	70-130	35	X
Ethylbenzene	<0.00202	0.101	0.0477	47	0.100	0.0538	54	12	71-129	35	X
m,p-Xylenes	<0.00403	0.202	0.0942	47	0.200	0.107	54	13	70-135	35	X
o-Xylene	<0.00202	0.101	0.0459	45	0.100	0.0504	50	9	71-133	35	X

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: Michalada 3D

Work Order #: 571334

Project ID: 212C-MD-00958.03

Lab Batch ID: 3037292

QC- Sample ID: 572380-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 01/02/2018

Date Prepared: 01/02/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0656	66	0.101	0.0535	53	20	70-130	35	X
Toluene	<0.00200	0.100	0.0584	58	0.101	0.0455	45	25	70-130	35	X
Ethylbenzene	<0.00200	0.100	0.0587	59	0.101	0.0450	45	26	71-129	35	X
m,p-Xylenes	0.00547	0.200	0.114	54	0.201	0.0871	41	27	70-135	35	X
o-Xylene	0.00256	0.100	0.0617	59	0.101	0.0472	44	27	71-133	35	X

Lab Batch ID: 3036429

QC- Sample ID: 571265-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

Analyst: LRI

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	232	248	485	102	248	484	102	0	90-110	20	

Lab Batch ID: 3036429

QC- Sample ID: 571663-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

Analyst: LRI

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1010	250	1230	88	250	1240	92	1	90-110	20	X

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

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

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: Michalada 3D

Work Order # : 571334

Project ID: 212C-MD-00958.03

Lab Batch ID: 3036940

QC- Sample ID: 572053-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/26/2017

Date Prepared: 12/26/2017

Analyst: JUM

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)	<15.0	1000	944	94	1000	955	96	1	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	775	78	1000	833	83	7	70-135	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.

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571334

ANALYSIS REQUEST

1kg Tamarit

Michaelada 3D

(county, state) Eddy Co NM

212C-MD-00958.D3

005

Receiving Laboratory:

Sampler Signature:

Comments:

☐ Special Report Limits or TRRP Report

ORIGINAL COPY



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 12/15/2017 01:00:00 PM

Work Order #: 571334

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

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Connie Hernandez

Date: 12/15/2017

Checklist reviewed by:

Mike Kimmel

Date: 12/21/2017