### SITE INFORMATION

		нерог	т туре: С	iosure R	eport	1 10 10 m V · · ·	an and an and a state of the st			
General Site In	formation:									
Site:	•	Moncrief St	ate #001							
Company:		COG Opera	ting LLC							
Section, Towns	ship and Range	Unit L	Sec 23	T17S	R28E		<u></u>			
Lease Number.		API-30-015-	25017							
County:		Eddy Count	ty							
GPS:			<u>32.81742° N</u>	l		10	4.15406° W			
Surface Owner	··	State								
wineral Owner:		From Artonia	rom Artecia travel east for approx 12.5 miles on huse 82. Turn parth on Red Lake Rd, and							
		travel approx.	1.5 miles turnin	g east on the	lease road t	raveling 1.0	miles east to the location.			
Release Data				and the second second	ian w					
Date Released:		6/1/2013								
Type Release:	Type Release:		ater							
Source of Conta	Source of Contamination:		nc on a water t	ank.						
Fluida Released:	ad.	10 bbis								
Fiulus Hecovere	<b>;U.</b> M. (*******		and a straight of the	ing and a strate i	1. Marine a	1.1.21 1.14 10.31 1	a yo cara a ta			
UTTICIAL COMMU						19 ( 19 - 27) - 16 19 - 20 - 1 - 1 - 16 19 - 20 - 1 - 1 - 16				
Name:	Robert McNeill				Ike Tava	rez				
Company:	COG Operating, LLC				Tetra Te	ch				
Address: One Concho Cente		r			4000 N.	Big Spring	St.			
	600 W. Illinois Ave	•								
Citv:	Midland Texas, 79	701			Midland	Texas				
Phone number:	(432) 686-3023				(432) 68	2-4559				
Fax:	(432) 684-7137				(102) 00					
Fmail:	rmcneill@concho		 ~		ike tavarez@tetratech.com					
			<u></u>		Intoritario					
Ranking Criteri	a									
Depth to Ground	lwater:		Ranking Scol	re		Site D	ata			
<50 ft			20							
50-99 ft			10			10				
>100 ft.			0			0				
WollHood Ductor	tion		Danking Co.		<u></u>	011- 5				
Water Source -1	000 ft Privata -200 l		Pariking Scol			Site D	ala			
Water Source >1	,000 ft., Private >200 f	t.	0			0				
			1	I,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Surface Body of	Water:		Ranking Scol	re		Site D	ata			
<200 ft.			20							
200 ft - 1,000 ft.			10							
> 1,000 II.			U			0				
	otal Ranking Score.		10			F	RECEIVED			
		Accept	able Soil <b>RRA</b>	L (mg/kg)	કે પ્ર ે સ ગે મ	1				
		Benzene	Total BTE	Х ТРН			MAR <b>05</b> 2014			
		10	50	1,000						
						I ININ	IUCU ARTESIA			



January 15, 2014

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

#### Re: Closure Report for the COG Operating LLC, Moncrief State #001 Tank Battery, Unit L, Section 23, Township 17 South, Range 28 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the Moncrief State #001 Tank Battery located in Unit L, Section 23, Township 17 South, Range 28 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.81742°, W 104.15406°. 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 1, 2013, which released approximately ten (10) barrels of produced water from a murphy switch failure. To alleviate the problem, COG personnel repaired the murphy switch. Seven (7) barrels of produced water were recovered. The spill was contained within the berms of the tank battery affecting an area approximately 20' X 35'. The initial C-141 form is enclosed in Appendix A.

#### Groundwater

There were no wells listed in Section 23, however to the NMOCD groundwater map the depth to groundwater is between 50' and 100' 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, dated August 13, 1993. The guidelines require a riskbased 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 1,000 mg/kg.

#### **Soil Assessment and Analytical Results**

On July 12, 2013, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, a shallow hydrocarbon impact was detected in the subsurface soils. TPH and total BTEX concentrations were detected above the RRAL in the area of AH-2 of 1,254 mg/kg and 67.4 mg/kg at 0-1.0' below surface. Auger hole (AH-2) was undefined for both BTEX and TPH.

Auger holes (AH-1 and AH-2) showed chloride concentrations at 0-1' of 1,420 mg/kg and 19,100 mg/kg, respectively. Deeper samples could not be collected due to the dense formation at the location. The areas of AH-1 and AH-2 were not vertically defined for chlorides.

#### **Remedial Activities**

On December 11, 2013, Tetra Tech personnel supervised the excavation of impacted material as highlighted (green) in Table 1 and shown on Figure 4. Prior to excavating, the areas of AH-1 and AH-2 were trenched with a mini-excavator to define extents for chlorides. In addition, the area of AH-2 was evaluated for TPH and total BTEX.

Auger holes (AH-1 and AH-2) were trenched to a depth of 3.0' and deeper excavation could not be performed due to a dense underlying formation. Referring to Table 1, the area of AH-1 (T-1) showed chloride concentrations of 2,100 mg/kg at 2.0' and 949 mg/kg at 3.0' below surface. Based on the results, the area was excavated to approximately 3.0' below surface.

In the area of AH-2 (T-2) showed elevated chloride concentrations of 26,400 mg/kg at 1.0' and declined to 12,600 mg/kg at 3.0' below surface. This area was not vertically defined. In addition, the TPH and total BTEX concentrations declined below the RRAL at 1.0' below surface. Due to the proximity of equipment, lines, and tanks in the area of AH-2, the area was excavated to a depth of 1.0' below surface. Based on the data and limited impacted area, the remaining impacted soil will be deferred until the abandonment of the facility. In addition, a clay cap was installed in both areas to prevent vertical migration of the remaining impact in the



soils. Approximately 18 yards of impacted soil were transported to proper disposal and the excavation was backfilled with clean soil to grade.

#### Conclusion

COG requests closure of this site based on the remedial actions taken. A Final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remedial activities for this site, please call me at (432) 682-4559.

Respectfully submitted, TETRA TECH

Man Kyurt.

3

Marcus Kujawski Technician IV

cc: Robert McNeill - COG

## Figures



Drawn By: Isabel Marmolejo



Drawn By: Isabel Marmolej





Dmwn By: Isabel Mamolojo



## Tables

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# Table 1COG Operating, LLCMoncriefEddy County, New Mexico

Semala ID	Comple Date	Sample	Excavation	Soil	Status		TPH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride	
	Sample Date		Depth (ft)	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	7/24/2013	9-1	0.	strac off	X	39.5	47.7	5.517	<0.0200	<0.0200×	<0.0200	<0.0200	<0.0200	1,420	
T-1	12/12/2013	0			X									846	
		2			<u> </u>							6 7		2,100	
		3	3		X							an a		949	
AH-2	7/24/2013	0-1	0		X	577	677	1,254	<0.100	3.7	22.9	40.8	67.4	19,100	
T-2	12/12/2013		2 1 -		X	<10.0	<i>i</i> 158	158	<0.050	.<0.050	<0.050	<0.150	.<0.300	26,400	
	п	2	-	Х		<50.0	824	824	<0.050	<0.050	<0.050	<0.150	<0.300	15,400	
	11	3	-	Х		<10.0	42.6	42.6	<0.050	<0.050	<0.050	<0.150	<0.300	12,600	
AH-2 T-2	7/24/2013	0-1 2 3	0 - -	X X	X	577 <10.0 <50.0 <10.0	677 3158 824 42.6	1,254 1.58 824 42.6	<0.100 <0.050 <0.050 <0.050	3.7 <0.050 <0.050 <0.050	22.9 <0.050 <0.050 <0.050	40.8 <0.150 <0.150 <0.150	67.4 <0.300 <0.300 <0.300	19,100 26,400 15,400 12,600	

Excavated Depths

(-)

Not Analyzed

\_Clay Liner Installed

T-2 BTEX and TPH analyzed by Cardinal Lab

COG Operating LLC Moncrief St. #1 Tank Battery Eddy County, New Mexico



**TETRA TECH** 



View North - T-1 in area of AH-1 at 3.0'



View North - T-2 in area of AH-2 at 3.0'

COG Operating LLC Moncrief St. #1 Tank Battery Eddy County, New Mexico



TETRA TECH







View West - AH-2 area at 1.0'

COG Operating LLC Moncrief St. #1 Tank Battery Eddy County, New Mexico





View South - AH-1 area backfilled



View East – AH-2 area backfilled

TETRA TECH

## Appendix A

#### State of New Mexico Energy Minerals and Natural Resources

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

•

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

			Rele	ase Notifi	catio	n and Co	orrective A	ction		*		
						OPERA'	ΓOR	Б	7] Initi	al Report	П	Final Repor
Name of Co	mpany	COG OP	ERATIN	G LLC		Contact	Pa	at Ellis		F		
Address	600 We	est Illinois Av	venue, M	idland, TX 797	/01	Telephone 1	No. 432-	230-0077				
Facility Nat	ne	MONCRI	EF STAT	E #001		Facility Typ	e TANK	BATTE	RY			
Surface Ow	ner STA	ТЕ		Mineral	Owner				Lease 1	No. (API#)	30-01	5-25017
				LOC	ATIC	N OF RE	LEASE					
Unit Letter L	Section 23	Township 17S	Range 28E	Feet from the	Nort	h/South Line	Feet from the	East/We	st Line	County	EDDY	
				Latitude 32.0 NA	81742 <b>FURI</b>	Longi E OF REL	tude 104.15406 EASE	5				
Type of Rele	ase Produc	ed water				Volume of	Release 10bbls	· ·	/olume	Recovered	7bbis	
Source of Re	lease Murj	ohy switch on	water tank			Date and H 06-01-201	four of Occurrenc	ce [	Date and 6-01-20	Hour of Di	scovery	,
Was Immedi	ate Notice	Given?	Yes 🛛	No 🛛 Not F	Required	If YES, To	Whom?					
By Whom?						Date and H	lour					
Was a Water	Was a Watercourse Reached?					If YES, Volume Impacting the Watercourse.						
If a Watercon	irse was Im	pacted, Descr	ibe Fully.	<u>.</u>	<u></u>							<u> </u>
<u> </u>			P 1 4								·····	
The murphy	switch mal	functioned and	l did not t	urn on the transfo	er pump	. We have repl	aced the murphy :	switch to p	prevent i	eoccurrence	2.	
Describe Are Initially 10bl vacuum truch delineate any work.	a Affected is of produ . The spill possible c	and Cleanup / ced water wer was complete ontamination (	e released ly contain from the re	due to a murphy ed inside the faci clease and we wi	/ switch ility wai 11 prese	failure on the lls. All free flu nt a work plan	water tank. We w id has been recove to the NMOCD fo	vere able to cred. Tetra for approva	recover Tech w I prior to	r 7bbls of pr ill sample t o any signifi	roduced he spill icant re	water with a site area to mediation
I hereby cert regulations a public health should their or the enviro federal, state	fy that the ll operators or the envi operations l ument. In a or local la	information gi are required t ronment. The nave failed to a addition, NMC ws and/or regu	ven above o report an acceptane idequately ICD accept lations.	t is true and com ad/or file certain the of a C-141 rep investigate and nance of a C-141	plete to release ort by t remedia report	the best of my notifications a he NMOCD m ate contaminat does not reliev	knowledge and u nd perform correc arked as "Final R ion that pose a thr re the operator of a	inderstand ctive action leport" doc reat to grou responsibi	that pur is for rel is not rel ind wate lity for c	suant to NM leases which lieve the op- er, surface w compliance	fOCD r n may e erator o ater, hu with an	ules and ndanger f liability man health y other
							OIL CON	SERVA	TION	DIVISI	ON	
Signature:	ĪZ	Let 1	tin,	/								
Printed Name		Rober	rt Grupos	Jr.		Approved by	District Supervis	ior:				
_Title:		Senior Enviro	nmental C	oordinator		Approval Da	te:	Ex	piration	Date:		
E-mail Addre	:55:	rgrubbs@	)concho.c	om		Conditions o	f Approval:			Attache	4 🖸	
Date: 06-0 Attach Addi	5-2013 tional She	ets If Necess	Phone: ary	432-661-66	01							

State of New Mexico Energy Minerals and Natural Resources

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

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

Lease No. (API#)30-015-25017

#### **Release Notification and Corrective Action**

	OPERATOR	Initial Report	🛛 Final Report
Name of Company COG Operating LLC	Contact Robert McNeill		
Address 600 W. Illinois Ave, Midland, Texas 79701	Telephone No. (432) 685-4332		
Facility Name Moncrief St. #1	Facility Type Tank Battery		

Surface Owner: State

#### LOCATION OF RELEASE

Mineral Owner

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
L	23	175	28E					
	, ,		1	1				

**Latitude** 32.81742° N **Longitude** 104.15406° W

NATURE OF RELEASE

Source of Release: Murphy Switch on Water Tank       Date and Hour of Occurrence       Date and Hour of Discovery         Was Immediate Notice Given?       If YES, To Whom?       06/01/2013 9:00 am         By Whom?       Date and Hour         Was a Watercourse Reached?       If YES, Volume Impacting the Watercourse	
Was Immediate Notice Given?     06/01/2013     06/01/2013 9:00 am       Was Immediate Notice Given?     If YES, To Whom?       By Whom?     Date and Hour       Was a Watercourse Reached?     If YES, Volume Impacting the Watercourse	
Was Immediate Notice Given?       If YES, To Whom?         By Whom?       Date and Hour         Was a Watercourse Reached?       If YES, Volume Impacting the Watercourse	
Yes     No     Not Required       By Whom?     Date and Hour       Was a Watercourse Reached?     If YES, Volume Impacting the Watercourse	
By Whom?     Date and Hour       Was a Watercourse Reached?     If YES, Volume Impacting the Watercourse	
Was a Watercourse Reached?	
1 $11 $ $1 $ $120 $ , $1000000000000000000000000000000000000$	
$\Box$ Yes $\boxtimes$ No N/A	
If a watercourse was impacted, Describe Fully."	
N/A 1 100 05 2014	
MAR VO 2014	ł
Describe Cause of Problem and Remedial Action Taken.*	A
The murphy witch malfunctioned and did on turn on the transfer pump. The murphy switch was replaced to prevent reoccurrence.	
Describe Area Affected and Cleanup Action Taken *	
Initially 10bbls of produced water were released due to a murphy switch failure on the water tank. 7bbls of produced water were recovered with a vacuu	m
truck. The spill was completely contained inside the facility walls. Tetra Tech inspected the site and collected samples to define spills extent. Soil that	
exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech	
prepared closure report and submitted to NMOCD for review.	
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 and perform corrective actions for releases which may endenger	
nublic health or the environment. The accentance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of lightlity.	
should their operations have failed to adequately investigate and remediate contamination that nose a threat to ground water surface water human healt	h
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.	
OIL CONSERVATION DIVISION	
Signature:	
Approved by District Supervisor:	
Printed Name: Ike Tavarez	
Title: Project Manager Approval Date: Expiration Date:	
Title: Project Manager     Approval Date:     Expiration Date:	
Title: Project Manager       Approval Date:       Expiration Date:         E-mail Address: Ike. Tavarez@TetraTech.com       Conditions of Approval:       Attached	

\* Attach Additional Sheets If Necessary

## Appendix B

#### Water Well Data Average Depth to Groundwater (ft) COG - Moncried State #001 Eddy County, New Mexico

	16 \$	South	:	27 East	t
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 70	26	25
31	32	33	34	35	36

	16 \$	South	:	28 East	t
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 61	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	16 5	South			
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 220 dry	13
19 110	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

17 South 27 East 11 64 12 18 19 26

17	South	28 East
		20 2001

6	5	4	3	2 28	1
7	8	9	10	11	12
18	17	16	15	14 80	13
19 224	20	21	22 45 79	23 SITE	24
30	29	28	27	26	25
31	32 SITE	33	34	35 <b>258</b>	36

	<u>17 Sc</u>	outh	29	East	
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22 76 80	23	24
30	29 210 208	28	27	26	25
31	32	33	34	35	36

18 South 27 East

6	5	4	3	2	1
7	8	9	10 <b>50</b>	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28 100	27	26	25
31 <b>66</b>	32	33	34	35	36

10 3	South		28 East
15	14	12	12

6	5	4	3	2	11
		108			
7	8 81	9	10	11	12
49	69				
18	17	16	15	14	13
19	20	21 226	22	23	24
30 137	29	28	27	26	25
31	32	33	34	35	36

18	South	29 Ea:	st
			•••

6	5	4	3	2	1
7	8	9	10 95	11	12
18	17	16	15	14	13
19	20	21	22	23	24 158
30	29	28	27	26	25
31	32	33	34	35	36

New Mexico State Engineers Well Reports

USGS Well Reports

Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

Field water level

New Mexico Water and Infrastructure Data System

## Appendix C

### **Summary Report**

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Project Location:Eddy Co., NMProject Name:COG/MoncriefProject Number:112MC05530

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
335252	AH-1 0-1'	soil	2013-07-12	00:00	2013-07-16
335253	AH-2 0-1'	soil	2013-07-12	00:00	2013-07-16

	BTEX			TPH DRO - NEW	TPH GRO	
	Benzene	Benzene Toluene Ethylbenzene Xylene			DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
335252 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	477 Qs	39.5
335253 - AH-2 0-1'	$< 0.100^{-1}$	3.71	22.9	40.8	677 Qs	557

Sample: 335252 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		1420	nıg/Kg	4

#### Sample: 335253 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		19100	mg/Kg	4

<sup>1</sup>Dilution due to hydrocarbons.

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: July 24, 2013

Work Order: 13071701



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-200 East Sunset Road, Suite E El Paso, Texas 79922 915-5002 Basin Street, Suite A1 Midland, Texas 79703 432-(BioAquatic) 2501 Mayes Rd., Suite 100 Carroliton, Texas 75006 972-E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

gtraceanalysis.com WEB! www

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

### Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: July 24, 2013

FAX 805 - 794 - 1298

FAX 915-585-4944

FAX 432 689 8313

Work Order: 13071701

806-794-1296

915-585-3443

432-689-6301

972-242-7750

Project Location:Eddy Co., NMProject Name:COG/MoncriefProject Number:112MC05530

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
335252	AH-1 0-1'	soil	2013-07-12	00:00	2013-07-16
335253	AH-2 0-1'	soil	2013-07-12	00:00	2013-07-16

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 21 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael Alla

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

## **Report Contents**

Case Narrative	4
Analytical Report         Sample 335252 (AH-1 0-1')         Sample 335253 (AH-2 0-1')	<b>5</b> 5 6
Method Blanks	0
OC Batch 103151 - Method Blank (1)	8
OC Batch 103193 - Method Blank (1)	8
OC Batch 103208 - Method Blank (1)	8
OC Batch 103250 - Method Blank (1)	q
QC Batch 103326 - Method Blank (1)	9
Laboratory Control Spikes	10
OC Batch 103151 - LCS (1)	10
OC Batch $103103 - LCS(1)$	10
OC Batch 103208 - LCS (1)	10
OC Batch $103250 - LCS(1)$	11
OC Batch $103266 - LCS(1)$	12
OC Batch $103151 - MS(1)$	12
OC Batch 103193 - MS (1)	13
OC Batch 103208 - MS (1)	13
OC Batch 103250 - MS (1)	1/
QC Batch 103326 - MS (1)	14
Calibration Standards	16
OC Batch 103151 - CCV (1)	16
OC Batch $103151 - CCV$ (2)	16
OC Batch $103103 - CCV (1)$	16
OC Batch $103193 - CCV$ (2)	16
OC Batch $103193 - CCV (3)$	16
OC Batch $103193 - CCV$ (4)	17
QC Batch 103208 - CCV (1)	17
QC Batch 103208 - CCV (2)	17
QC Batch 103208 - CCV (3)	18
QC Batch 103250 - CCV (1)	18
QC Batch 103250 - CCV (2)	18
QC Batch 103250 - CCV (3)	18
QC Batch 103326 - CCV (1)	18
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	Uلا

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## Case Narrative

Samples for project COG/Moncrief were received by TraceAnalysis, Inc. on 2013-07-16 and assigned to work order 13071701. Samples for work order 13071701 were received intact at a temperature of 5.4 C.

		$\operatorname{Prep}$	Prep	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	87449	2013-07-18 at 15:00	103208	2013-07-19 at 15:16
BTEX	S 8021B	87548	2013-07-23 at 09:00	103326	2013-07-23 at 11:45
Chloride (Titration)	SM 4500-Cl B	87396	2013-07-17 at 10:16	103151	2013-07-18 at 11:19
TPH DRO - NEW	S 8015 D	87433	2013-07-18 at 14:00	103193	2013-07-19 at 10:43
TPH GRO	S 8015 D	87486	2013-07-19 at 15:00	103250	2013-07-21 at 12:00

Samples were analyzed for the following tests using their respective methods.

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13071701 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

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## **Analytical Report**

#### Sample: 335252 - AH-1 0-1'

Laboratory:	Midland									
Analysis:	BTEX		A	nalytica	l Method:	S 8021	В		Prep Method	: S 5035
QC Batch:	103326		Ι	)ate Ana	lyzed:	2013-0'	7-23		Analyzed By:	KC
Prep Batch:	87548		S	ample P	reparation	n: 2013-0'	7-23		Prepared By:	KC
						$\operatorname{RL}$				
Parameter		Flag	, ,	Cert		Result	Units		Dilution	$\mathbf{RL}$
Benzene		U		1	<	< 0.0200	mg/Kg		1	0.0200
Toluene		U		1	<	< 0.0200	mg/Kg		1	0.0200
Ethylbenzene	3	υ		1	<	< 0.0200	mg/Kg		1	0.0200
Xylene		U	······	1	<	<0.0200	mg/Kg		1	0.0200
								Spike	Percent	Recovery
Surrogate			Flag	Cert	$\operatorname{Result}$	Units	Dilution	Amount	Recovery	Limits
Triffuorotolu	ene (TFT)				1.85	mg/Kg	1	2.00	92	70 - 130
4-Bromofluor	obenzene (4-BFB)				2.32	mg/Kg	1	2.00	116	70 - 130
Sample: 33	5252 - AH-1 0-1	,								
Laboratory:	Midland									
Analysis:	Chloride (Titrati	on)		Anal	lytical Me	thod: S	M 4500-Cl B		Prep Metho	od: N/A
QC Batch:	103151			Date	e Analyzec	l: 20	013-07-18		Analyzed B	y: AR
Prep Batch:	87396			Sam	ple Prepa	ration: 20	013-07-17		Prepared B	y: AR
						DĬ				

			RL			
Parameter	Flag	Cert	Result	$\mathbf{Units}$	Dilution	$\operatorname{RL}$
Chloride			1420	mg/Kg	10	4.00
						,

#### Sample: 335252 - AH-1 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	tory: Midland s: TPH DRO - NEW tch: 103193 atch: 87433		Analyti Date A Sample	ical Method: nalyzed: Preparation:	S 8015 D 2013-07-19 2013-07-18	Prep Method: Analyzed By: Prepared By:	N/A CW CW
				$\operatorname{RL}$			
Parameter		$\operatorname{Flag}$	$\operatorname{Cert}$	$\operatorname{Result}$	Units	Dilution	$\mathbf{RL}$
DRO		Qs	1	477	mg/Kg	1	50.0

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Surrogate		Flag	Cer	t, I	Result	Units	Diluti	ion	Spik Amou	e int - I	Percent Recovery	Re L	covery imits
n-Tricosane	Qar	QĦr			164	mg/Kg	1		100		164	55.1	- 135.7
Sample: 33	5252 - Al	H-1 0-1	,										
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GR 103250 87486	.0			Analytic Date An Sample I	al Method: alyzed: Preparation	S 8015 2013-0 1: 2013-0	5 D 97-21 97-19			Prep Met Analyzed Prepared	thod: By: By:	S 5035 KC KC
							$\mathbf{RL}$						
Parameter			Flag		Cert	R	esult		Units		Dilution		$\operatorname{RL}$
GRO					1		39.5		mg/Kg		2		4.00
										Spike	Percent	R	ecovery
Surrogate				Flag	$\operatorname{Cert}$	Result	Units	Dilu	tion	Amount	Recovery	y .	Limits
Trifluorotolu	ene (TFT)					3.60	mg/Kg	2	2	4.00	90	7	0 - 130
4-Bromofluor	obenzene	(4-BFB)				4.68	$\mathrm{mg/Kg}$	2 2	2	4.00	117	7	0 - 130

#### Sample: 335253 - AH-2 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland BTEX 103208 87449		Analytical Date Anal Sample Pr	Method: lyzed: reparation	S 80211 2013-07 1: 2013-07	3 7-19 7-18		Prep Metho Analyzed B Prepared B	od: S 5035 y: KC y: KC
					$\operatorname{RL}$				
Parameter		Flag	Cert		Result	Units		Dilution	$\operatorname{RL}$
Benzene	1	υ	1		< 0.100	mg/Kg		• 5	0.0200
Toluene			ł		3.71	mg/Kg		5	0.0200
Ethylbenzene			1		22.9	mg/Kg		5	0.0200
Xylene			1		40.8	mg/Kg		5	0.0200
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)			8.45	mg/Kg	5	10.0	84	70 - 130
4-Bromofluor	obenzene (4-BFB)			11.4	mg/Kg	5	10.0	114	70 - 130

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#### Sample: 335253 - AH-2 0-1'

Laboratory:	Midland						
Analysis:	Chloride (Titration	)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	103151		Date An	alyzed:	2013-07-18	Analyzed By:	AR.
Prep Batch:	87396		Sample I	Preparation:	2013-07-17	Prepared By:	AR.
				$\operatorname{RL}$			
Parameter	H	<sup>7</sup> lag	Cert	$\operatorname{Result}$	Units	Dilution	$\mathbf{RL}$
Chloride				19100	mg/Kg	10	4.00

#### Sample: 335253 - AH-2 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	boratory: Midland alysis: TPH DRO - NEW C Batch: 103193 ep Batch: 87433			Ana Dat San	Analytical Method: Date Analyzed: Sample Preparation:			5 D 07-19 07-18	Prep Method: Analyzed By: Prepared By:		N/A CW CW
						$\operatorname{RL}$					
Parameter			Flag	$\operatorname{Cert}$	R	esult		Units	Dilution		$\mathbf{RL}$
DRO			Qв	1		677		mg/Kg	1		50.0
C		Dhara	Cont	Denult	<b>T T:</b> <i>t</i>	יוים		Spike	Percent	Reco	very
Surrogate		Flag	Cert	Result	Units	Dilu	tion	Amount	Recovery	Lin	nts
n-Tricosane	Qsr	Qsr		181	mg/Kg	-	1	100	181	55.1 -	135.7

#### Sample: 335253 - AH-2 0-1'

Laboratory: Midland Analysis: TPH GRO QC Batch: 103250 Prep Batch: 87486			Analytic Date An Sample l	al Method alyzed: Preparatio	: S 8015 2013-0 n: 2013-0	5 D 97-21 97-19		Prep Metho Analyzed By Prepared By	d: S 5035 7: KC 7: KC
					$\operatorname{RL}$				
Parameter	Flag		Cert	]	Result	Uni	ts	Dilution	$\mathbf{RL}$
GRO			1		557	mg/K	g	20	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				38.1	mg/Kg	20	40.0	95	70 - 130
4-Bromofluorobenzene (4-BFI	3)			47.5	mg/Kg	20	40.0	119	70 - 130

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Method Blanks		

Chloride				<3.85	mg/Kg	4
Parameter		Flag	Cert	MDL Result	Units	RL
QC Batch: Prep Batch:	$103151 \\ 87396$		Date Analyzed: QC Preparation:	2013-07-18 2013-07-17	Analyzed By Prepared By	y: AR 7: AR
Method Bla	ank (1)	QC Batch: 103151				

Method Bla	ank (1)	QC	Batch: 103	8193						
QC Batch: 103193 Prep Batch: 87433				Dat QC	e Analyzed: Preparation:	2013-07-19 2013-07-18		Analy Prepa	vzed By: ared By:	CW CW
Parameter			Fl	ag	Cert		MDL Result	Units		$\operatorname{RL}$
DRO					1		15.8	mg/Kg		50
Surrogate		Flag	$\operatorname{Cert}$	Result	Units	Dilution	Spike Amount	Percent Recovery	Reco Lin	overy nits
n-Tricosane				115	mg/Kg	1	100	115	55.1 -	135.7

Method Blank (1)	QC Batch:	103208

QC Batch: Prep Batch:	103208 87449		Date A QC Pro	.nalyzed: eparation:	2013-07- 2013-07-	19 18		Analyzed By: Prepared By:		KC KC
						MDL				
Parameter		Flag		Cert		Result		Units		$\operatorname{RL}$
Benzene				1		< 0.00810	1	ng/Kg		0.02
Toluene				1		< 0.00750	mg/Kg			0.02
Ethylbenzene				1		< 0.00730	1	ng/Kg		0.02
Xylene				1		< 0.00700	]	ng/Kg		0.02
			<b>a</b> .	<b>T</b>	<b>TT</b> 4.		Spike	Percent	Rec	overy
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Lii	nits
Trifluorotolue	ne (TFT)			1.88	mg/Kg	1	2.00	94	70 -	· 130
						conti	nued			

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method blank continued	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-Bromofluorobenzene (4-BFB)	0	·	1.96	mg/Kg	1	2.00	98	70 - 130
							, , <u>, , , , , , , , , , , , , , , , , </u>	
Method Blank (1) QC Ba	atch: 103250							
QC Batch: 103250 Prep Batch: 87486	103250Date Analyzed:2013-07-2187486QC Preparation:2013-07-19			Analyzeo Prepareo	l By: KC l By: KC			
					MDL			
Parameter	Flag		Cert		Result	······	Units	RL
GRO			1		3.80		mg/Kg	4
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.78	mg/Kg	1	2.00	89	70 - 130
4-Bromofluorobenzene (4-BFB)			2.00	mg/Kg	. 1	2.00	100	70 - 130
Method Blank (1) OC B	atch: 103396							
	stelli, 100020							
QC Batch: 103326 Prep Batch: 87548		Date A QC Pr	nalyzed: eparation:	2013-07-1 2013-07-1	23 23		Analyzec Prepared	l By: KC By: KC
Parameter	Flag		Cert		MDL Result		Units	Β.Γ.
Benzene	1 1005		1		<0.00810		mg/Kg	0.02
Toluene			1		< 0.00750		mg/Kg	0.02
Ethylbenzene			1		< 0.00730	i	mg/Kg	0.02
V.,)			1		< 0.00700		mg/Kg	0.02
Ayiene								
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Surrogate Trifluorotoluene (TFT)	Flag	Cert	Result	Units mg/Kg	Dilution 1	Spike Amount 2.00	Percent Recovery 92	Recovery Limits 70 - 130

## Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	103151 87396	3151Date Analyzed:2013-07-18Analyzed:396QC Preparation:2013-07-17Prepared Prepared Pre										y: AR y: AR	
Param			F	СІ	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec. Limit	
Chloride					2390	mg/Kg	1	2500	<	3.85	96	85 - 115	
Percent recov	Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.												
				LCSD			Spike	Matrix		Rec.		RPD	
Param		F	С	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$	
Chloride				2510	mg/Kg	1	2500	<3.85	100	85 - 11	5 5	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

#### Laboratory Control Spike (LCS-1)

QC Batch:	103193	Date Analyzed:	2013-07-19	Analyzed By:	CW
Prep Batch:	87433	QC Preparation:	2013-07-18	Prepared By:	CW

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	260	mg/Kg	1	250	15.8	98	66.9 - 119.9

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param			F	С	$\begin{array}{c} \mathrm{LCSD} \\ \mathrm{Result} \end{array}$	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	$\operatorname{RPD}$ Limit
DRO				1	267	mg/Kg	ç 1	250	15.8	100	66.9 - 119.9	3	20
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.													
			l	$\mathcal{L}CS$	LCS	SD			Spike	LC	CS LCSD	Ŧ	Rec.
Surrogate			$\mathbf{R}$	esult	Res	ult	Units	Dil.	Amount	Re	c. Rec.	L	imit
n-Tricosane	Qsr	Qar		150	15	4 r	ng/Kg	1	100	15	0 154	76.8	- 140.2

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#### Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	103208 87449	I C	Date Analy QC Prepara	zed: 2013 ation: 2013	3-07-19 3-07-18		A I	Analyzed Prepared	By: KC By: KC	
Param		$\mathbf{F}$	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene			1	1.81	mg/Kg	1	2.00	< 0.00810	90	70 - 130
Toluene			1	1.84	$\mathrm{mg/Kg}$	1	2.00	< 0.00750	92	70 - 130
Ethylbenzene	9		i i	1.89	$\mathrm{mg/Kg}$	1	2.00	< 0.00730	94	70 - 130
Xylene			١	5.83	mg/Kg	1	6.00	< 0.00700	97	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	$\operatorname{RPD}$	$\mathbf{Limit}$
Benzene		1	1.79	mg/Kg	1	2.00	< 0.00810	90	70 - 130	1	20
Toluene		1	1.85	$\mathrm{mg/Kg}$	1	2.00	< 0.00750	92	70 - 130	0	20
Ethylbenzene		1	1.90	mg/Kg	1	2.00	< 0.00730	95	70 - 130	0	20
Xylene		1	5.86	$\mathrm{mg/Kg}$	1	6.00	< 0.00700	98	70 - 130	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	$\operatorname{Result}$	$\operatorname{Result}$	$\mathbf{U}\mathbf{n}\mathbf{i}\mathbf{t}\mathbf{s}$	Dil.	$\operatorname{Amount}$	Rec.	Rec.	$\mathbf{Limit}$
Trifluorotoluene (TFT)	1.88	1.85	mg/Kg	1	2.00	94	92	70 - 130
4-Bromofluorobenzene (4-BFB)	2.05	1.92	mg/Kg	1	2.00	102	96	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch:	103250	Date Analyzed:	2013-07-21	Analyzed By:	$\mathbf{KC}$
Prep Batch:	87486	QC Preparation:	2013-07-19	Prepared By:	$\mathbf{KC}$

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	С	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
GRO	· · · · · · · · · · · · · · · · · · ·	1	17.8	mg/Kg	1	20.0	<2.32	89	70 - 130
Porcont recovery is base	od on the spike rost	it RI	D is based	l on the spil	in and a	niko dunligat	a roundt		

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	С	$\begin{array}{c} \mathrm{LCSD} \\ \mathrm{Result} \end{array}$	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	$\operatorname{RPD}$ Limit
GRO		1	17.9	mg/Kg	1	20.0	<2.32	90	70 - 130	0	20
Percent recovery is based of	on the spike	resu	lt. RPD i	is based or	n the s	pike and sp	ike duplic	ate res	ult.		

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control spikes continued														
			LC	CS LO	CSD			Spike		LCS	LCSD	Rec.		
Surrogate			Res	alt Re	esult	Units	Dil.	Amour	ıt.	Rec.	Rec.	Limit		
			LC	CS LO	CSD			Spike		LCS	LCSD	Rec.		
Surrogate			Res	ult R	esult	Units	Dil.	Amour	ıt	Rec.	Rec.	$\operatorname{Limit}$		
Trifluorotoluene (TFT)			1.'	72 1	.71	mg/Kg	1	2.00		86	86	70 - 130		
4-Bromofluorobenzene (4-BFB)			2.0	)0 2	2.02	mg/Kg	1	2.00		100	101	70 - 130		
Laboratory Control Spike (LC	S-1)				1									
QC Batch: 103326			Date	e Anaiyz	ed: 2	013-07-23				An	alyzed I	3y: KC		
Prep Batch: 87548			QC	Preparat	30n: 2	013-07-23				Pr	epared I	By: KC		
				LCS			Spil	20	Mat	triv		Roa		
Param	$\mathbf{F}$	C	; R	lesult	Units	Dil.	Amo	unt	Res	sult	Rec.	Limit		
Benzene		1		1.73	mg/Kg	g 1	2.0	0	< 0.0	0810	86	70 - 130		
Toluene		1		1.80	mg/Kg	g 1	2.0	0	< 0.0	0750	90	70 - 130		
Ethylbenzene		1		1.87	mg/Kg	ç 1	2.0	0	< 0.0	0730	94	70 - 130		
Xylene		1		5.72	mg/Kg	ç 1	6.0	0	< 0.0	0700	95	70 - 130		
Percent recovery is based on the sp	ike re	esult.	RPD	is based	on the	spike and	spike d	uplicate	resu	lt.				
		$\mathbf{L}$	CSD			Spike	Mat	rix		Rec.		RPD		
Param	F C	C R	esult	Units	Dil.	Amount	Res	ult F	lec.	$\operatorname{Limit}$	RPI	) Limit		
Benzene	1	]	.75	mg/Kg	1	2.00	< 0.00	0810	88	70 - 13	0 1	20		
Toluene	ı	1	78	mg/Kg	1	2.00	< 0.00	)750	89	70 - 13	0 1	20		
Ethylbenzene	1	1	86	mg/Kg	1	2.00	<0.00	)730	93	70 - 13	0 0	20		
Xylene	1		5.64	mg/Kg	1	6.00	< 0.00	)700	94	70 - 13	0 1	20		

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD	<b>TT</b>	10.11	Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	$\operatorname{Amount}$	Rec.	Rec.	$\operatorname{Limit}$
Trifluorotoluene (TFT)	1.78	1.78	mg/Kg	1	2.00	89	89	70 - 130
4-Bromofluorobenzene (4-BFB)	1.93	1.87	mg/Kg	1	2.00	96	94	70 - 130

Matrix Spike (MS-1)	Spiked Sample: 335253
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QC Batch:	103151	Date Analyzed:	2013-07-18	Analyzed By:	AR
Prep Batch:	87396	QC Preparation:	2013-07-17	Prepared By:	AR

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Param	$\mathbf{F}$	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	] L	Rec. Jimit
Chloride			21900	mg/Kg	10	2500	19100	112	78.	9 - 121
Percent recovery is based on the	e spike res	ult RP	D is base	ed on the s	nike and	spike dupli	cate result.			
					pino una	opino dapi				
_	_	MSD			Spike	Matrix	I.	lec.		RPD
Param	F C	Resul	t Unit	ts Dil.	Amount	Result	Rec. L	imit	RPD	Limit
Chloride		21700	mg/ł	Kg 10	2500	19100	104 78.9	- 121	1	20
rercent recovery is based on the	e spike res	uit. KP	D is base	ed on the s	pike and	spike dupli	cate result.			
Matrix Spike (MS-1) Spil	ced Sample	e: 33525	2							
QC Batch: 103193		Da	te Analy	zed: 20	13-07-19			Analva	zed Bv:	CW
Prep Batch: 87433		OC OC	C Prepar	ation: $20$	13-07-18			Prepar	ed By:	ĊW
<u>-</u>		~~ ~	<b>.r</b> , <b>.e</b>	20						
			MS			Cmileo	Motuir		D	00
Daman	F	C		II.	Dil	бріке	Matrix Decult	Dec	n T:	ec.
	Г	<u> </u>	844	mg/Kg	<u>1</u>	250		<u>nec.</u>	26 1	1/17 9
		1		<u> </u>	., .	.1 1	++11	141	00.1	- 141.4
Percent recovery is based on the	e spike res	uit. RP	D is base	ed on the s	pike and	spike dupli	cate result.			
		MSD	)		Spike	Matrix	R	ec.		RPD
Param	F C	Resul	t Unit	ts Dil.	Amount	Result	Rec. Li	mit	RPD	Limit
DRO	Qa Qa I	850	mg/I	Kg 1	250	477	149 36.1	- 147.2	1	20
Percent recovery is based on the	e spike res	ult. RP	D is base	ed on the s	pike and	spike dupli	cate result.			
	o opino roz	-			pine und	opino dupi			_	
~	MS	N	ISD			Spike	MS	MSD	R	.ec.
Surrogate	Resul	t Re	esult	Units	Dil.	Amount	Rec.	Rec.	Li	mit
1-Tricosane Qsr Qsr	184		.82	mg/Kg	1	100	184	182	78.3	- 131.6
Matrix Spike (MS-1) Spik QC Batch: 103208 Prep Batch: 87449	æd Sample	e: 33503 Da QC	4 .te Analy C Prepar	yzed: 20 ation: 20	13-07-19 13-07-18			Analy Prepa	zed By: red By:	KC KC
			MS			Spike	Matrix			Rec.
Param	$\mathbf{F}$	$\mathbf{C}$	$\operatorname{Result}$	Units	Dil.	Amount	Result	$\operatorname{Re}$	c.	Limit
		1	1.85	mg/Kg	1	2.00	< 0.0081	0 92	2 7	0 - 130
Benzene				177	1	2.00	< 0.0075	0 0'	) 7	1 1 20
Benzene Toluene		1	1.85	mg/Kg	1	2.00	<0.0010	0 94	6 N	0 ~ 130
Benzene Toluene Ethylbenzene		1	$\begin{array}{c} 1.85 \\ 1.92 \end{array}$	mg/Kg mg/Kg	1	2.00	< 0.0073	0 90	5 <b>7</b> 1	) - 130 ) - 130

Report Date:         July 24, 2013           112MC05530	Work Order: 13071701 COG/Moncrief								Page Number: 14 of 21 Eddy Co., NM				
Param	$\mathbf{F}$	С	$egin{array}{c} \mathrm{MSD} \ \mathrm{Result} \end{array}$	Unit	ts Dil	Spike . Amount	Mat Res	rix ult 1	Rec.	Re Lin	e. 1it Ri	PD	RPD Limit
Benzene		1	1.75	mg/I	Kg 1	2.00	< 0.00	)810	88	70 -	130	6	20
Toluene		1	1.80	mg/I	Kg 1	2.00	< 0.00	)750	90	70 -	130	3	20
Ethylbenzene		1	1.85	mg/I	Kg 1	2.00	< 0.00	)730	92	70 -	130	4	20
Xylene		1	5.63	ng/I	Kg 1	6.00	< 0.00	)700	94	70 -	130	3	
Percent recovery is based on the	e spik	e rest	ılt. RPD	) is bas	ed on th	ie spike and	spike d	uplicate	e resu	lt.			
			Ν	ЛS	MSD			Spik	e	MS	MSD		Rec.
Surrogate			Re	sult	Result	Units	Dil.	Amou	nt	Rec.	Rec.	I	.imit
Trifluorotoluene (TFT)			1	.83	1.75	mg/Kg	1	2		92	88	70	- 130
4-Bromofluorobenzene (4-BFB)			1	.96	1.87	mg/Kg	1	$\overline{2}$		98	94	70	- 130
QC Batch: 103250 Prep Batch: 87486			Dat QC	e Anal Prepa MS	yzed: ration:	2013-07-21 2013-07-19	Sp	oike	Ma	/ F trix	Analyzed Prepared	By: By:	KC KC Rec.
Param		$\mathbf{F}$	С	$\operatorname{Result}$	Un	its Dil.	Am	ount	Res	sult	Rec.	Ι	$\operatorname{imit}$
GRO			1	17.7	mg	/Kg 1	20	0.0	<2	.32	88	70	- 130
Percent recovery is based on the	e spik	e res	ult. RPD MSD	) is bas	ed on th	ne spike and Spike	spike di Mat	uplicate rix	e resu	lt. Rec	,		RPD
Param	$\mathbf{F}$	С	Result	Un	its D	il. Amoun	nt Res	ult F	lec.	Lim	 it RI	٢D	Limit
GRO		1	17.7	mg/	/Kg	1 20.0	<2.	32	88	70 - 1	.30 (	)	20
Percent recovery is based on the	e spik	e resi	ılt. RPD	) is bas	ed on th	ne spike and	spike dı	uplicate	e resul	lt.		_	
Sumoguto			N Do	/1S	MSD	IIn;ta	נים	Spike	3	MS	MSD	J T	tec.
Trifluorotoluono (TET)			1	73	$\frac{1.61}{1.61}$	mg/Kg	<u></u> 1	Amou	110	<u>86</u>	80	L 	120
4-Bromofluorobenzene (4-BFB)			2	.10	1.86	mg/Kg	1	$\frac{2}{2}$		111	93	70	- 130 - 130
Matrix Spike (MS-1) Spil QC Batch: 103326 Prep Batch: 87548	ced Sa	umple	:: 335928 Dat QC	e Anal Prepa	yzed: ration:	2013-07-23 2013-07-23				₽ F	Analyzed Prepared	By: By:	KC KC
~		-	a -	MS			Spik	æ	Mat	rix	_	1	Rec.
Param		<u>F,</u>	CF	Result	Uni	ts Dil.	Amou	int	Rest	ult	Rec.	L	imit
Benzene			1	1.66	mg/l	Kg 1	2.00	0	< 0.00	0810	83	70	- 130

continued ...

Report Date: July 24, 2013	Work Order: 13071701	Page Number: 15 of 21
112MC05530	COG/Moncrief	Eddy Co., NM

matrix spikes continued ....

			MS			$\mathbf{Spike}$	Matrix		Rec.
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
Toluene		1	1.70	mg/Kg	1	2.00	< 0.00750	- 85	70 - 130
Ethylbenzene		1	1.76	mg/Kg	1	2.00	< 0.00730	88	70 - 130
Xylene		1	5.30	mg/Kg	1	6.00	< 0.00700	88	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		RPD		
Param	F	$\mathbf{C}$	$\operatorname{Result}$	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$
Benzene	-	1	1.70	mg/Kg	1	2.00	< 0.00810	85	70 - 130	2	20
Toluene		ı	1.73	mg/Kg	1	2.00	< 0.00750	86	70 - 130	<b>2</b>	20
Ethylbenzene		1	1.80	mg/Kg	1	2.00	< 0.00730	90	70 - 130	<b>2</b>	<b>20</b>
Xylene		3	5.50	mg/Kg	1	6.00	< 0.00700	92	70 - 130	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	${ m MS}$	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	$\operatorname{Result}$	Units	Dil.	Amount	Rec.	Rec.	$\mathbf{Limit}$
Triffuorotoluene (TFT)	1.67	1.83	mg/Kg	1	2	84	92	70 - 130
4-Bromofluorobenzene (4-BFB)	1.77	1.92	mg/Kg	1	2	88	96	70 - 130

,

## **Calibration Standards**

#### Standard (CCV-1)

QC Batch:	103151			Date 1	Analyzed:	2013-07-18		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2013-07-18

#### Standard (CCV-2)

QC Batch:	103151			Date 1	Analyzed:	2013-07-18		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	$\mathbf{U}\mathbf{n}\mathbf{i}\mathbf{t}\mathbf{s}$	Conc.	Conc.	Recovery	$\operatorname{Limits}$	Analyzed
Chloride		-		mg/Kg	100	99.7	100	85 - 115	2013-07-18

#### Standard (CCV-1)

QC Batch:	103193		Date	Analyzed:	2013-07-19		Analyz	Analyzed By: CW		
				CCVs	CCVs	CCVs Deveent	Percent	Data		
				rue	round	Percent	necovery	Date		
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
DRO		1	m mg/Kg	250	253	101	80 - 120	2013-07-19		

#### Standard (CCV-2)

QC Batch:	103193		Date	Date Analyzed: 2013-07-19			Analyzed By: CW		
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		1	m mg/Kg	$\overline{250}$	244	98	80 - 120	2013-07-19	

Report Dat 112MC0553	rt Date: July 24, 2013 Work Order: 13071701 [C05530 COG/Moncrief					Eddy Co., NM			
Standard (	(CCV-3)								
QC Batch: 103193			Date Analyzed: 2013-07-19				Analyzed By: CW		
				$\mathrm{CCVs}$	$\mathrm{CCVs}$	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param Flag		Cert	$\mathbf{Units}$	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		1	mg/Kg	250	260	104	80 - 120	2013-07-19	

#### Standard (CCV-4)

QC Batch:	103193		Date	Analyzed:	2013-07-19		Analyzed By: CW		
-				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		1	mg/Kg	250	256	102	80 - 120	2013-07-19	

#### Standard (CCV-1)

QC Batch:	103208			Date An	Date Analyzed: 2013-07-19 As					
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	$\operatorname{Limits}$	Analyzed	
Benzene			1	mg/kg	0.100	0.0926	93	80 - 120	2013-07-19	
Toluene		•	L	mg/kg	0.100	0.0924	92	80 - 120	2013-07-19	
Ethylbenzen	e		1	mg/kg	0.100	0.0911	91	80 - 120	2013-07-19	
Xylene			1	mg/kg	0.300	0.277	92	80 - 120	2013-07-19	

#### Standard (CCV-2)

QC Batch: 1	03208			Date An	alyzed: 20	Analy	Analyzed By: KC		
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene			1	mg/kg	0.100	0.0940	94	80 - 120	2013-07-19
Toluene			1	mg/kg	0.100	0.0917	92	80 - 120	2013-07-19
Ethylbenzene			1	mg/kg	0.100	0.0887	89	80 - 120	2013-07-19
Xylene			1	mg/kg	0.300	0.268	89	80 - 120	2013-07-19

			W	Vork Order: COG/Mo	13071701 ncrief		Page Nu	mber: 18 of 21 Eddy Co., NM
Standard (CCV-3)								
QC Batch: 103208			Date A	nalyzed: 2	013-07-19		Analy	zed By: KC
				CCVs	CCVs	CCVs	Percent	
		<b>.</b>		True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		i	mg/kg	0.100	0.0933	93	80 - 120	2013-07-19
Toluene		١	mg/kg	0.100	0.0913	91	80 - 120	2013-07-19
Ethylbenzene		1	mg/kg	0.100	0.0899	90	80 - 120	2013-07-19
Xylene			mg/ĸg	0.300	0.272	91	80 - 120	2013-07-19
Standard (CCV-1)								
QC Batch: 103250			Date A	nalyzed: 2	013-07-21		Analy	zed By: KC
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param Fl	ад (	lert	Units	Conc	Conc	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.999	100	80 - 120	2013-07-21
Standard (CCV-2)								
Standard (CCV-2) QC Batch: 103250			Date A	nalyzed: 20 CCVs True	013-07-21 CCVs Found	CCVs Powent	Analy Percent	zed By: KC
Standard (CCV-2) QC Batch: 103250	an (	'ort	Date A	.nalyzed: 20 CCVs True Conc	013-07-21 CCVs Found Conc	CCVs Percent Becovery	Analy Percent Recovery Limits	zed By: KC Date
Standard (CCV-2) QC Batch: 103250 Param Fla GRO	ag C	Cert	Date A Units mg/Kg	nalyzed: 20 CCVs True Conc. 1.00	013-07-21 CCVs Found Conc. 0.963	CCVs Percent Recovery 96	Analy Percent Recovery Limits 80 - 120	zed By: KC Date Analyzed 2013-07-21
Standard (CCV-2) QC Batch: 103250 Param Fla GRO Standard (CCV-3)	ag C	Cert	Date A Units mg/Kg	nalyzed: 20 CCVs True Conc. 1.00	013-07-21 CCVs Found Conc. 0.963	CCVs Percent Recovery 96	Analy Percent Recovery Limits 80 - 120	zed By: KC Date Analyzed 2013-07-21
Standard (CCV-2) QC Batch: 103250 Param Fla GRO Standard (CCV-3) QC Batch: 103250	a <u>g</u> C	Sert	Date A Units mg/Kg Date A	nalyzed: 20 CCVs True Conc. 1.00	013-07-21 CCVs Found Conc. 0.963	CCVs Percent Recovery 96	Analy Percent Recovery Limits 80 - 120 Analy	zed By: KC Date Analyzed 2013-07-21 zed By: KC
Standard (CCV-2) QC Batch: 103250 Param Fla GRO Standard (CCV-3) QC Batch: 103250	<u>ag C</u>	Cert	Date A Units mg/Kg Date A	nalyzed: 20 CCVs True Conc. 1.00 nalyzed: 20 CCVs	013-07-21 CCVs Found Conc. 0.963 013-07-21 CCVs	CCVs Percent Recovery 96	Analy Percent Recovery Limits 80 - 120 Analy Percent	zed By: KC Date <u>Analyzed</u> 2013-07-21 zed By: KC
Standard (CCV-2) QC Batch: 103250 Param Fla GRO Standard (CCV-3) QC Batch: 103250	ag C	Sert	Date A Units mg/Kg Date A	nalyzed: 20 CCVs True Conc. 1.00 nalyzed: 20 CCVs True	013-07-21 CCVs Found Conc. 0.963 013-07-21 CCVs Found	CCVs Percent Recovery 96 CCVs Percent	Analy Percent Recovery Limits 80 - 120 Analy Percent Recovery	zed By: KC Date Analyzed 2013-07-21 zed By: KC
Standard (CCV-2)         QC Batch:       103250         Param       Flagged         Standard (CCV-3)         QC Batch:       103250         Param       Flagged         CRO       Flagged	ag C	Vert	Date A Units mg/Kg Date A Units	nalyzed: 20 CCVs True Conc. 1.00 nalyzed: 20 CCVs True Conc.	013-07-21 CCVs Found Conc. 0.963 013-07-21 CCVs Found Conc. 0.972	CCVs Percent Recovery 96 CCVs Percent Recovery	Analy Percent Recovery Limits 80 - 120 Analy Percent Recovery Limits	zed By: KC Date Analyzed 2013-07-21 zed By: KC Late Analyzed

Report Date: July 24, 2013	Work Order: 13071701	Page Number: 19 of 21
112MC05530	COG/Moncrief	Eddy Co., NM

#### Standard (CCV-1)

QC Batch:	103326			Date An	alyzed: 20	13-07-23		Analy	zed By: KC	
					$\rm CCVs$	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Benzene		•••	1	mg/kg	0.100	0.0925	92	80 - 120	2013-07-23	
Toluene			1	m mg/kg	0.100	0.0928	93	80 - 120	2013-07-23	
Ethylbenzer	ie		1	mg/kg	0.100	0.0911	91	80 - 120	2013-07-23	
Xylene			1	mg/kg	0.300	0.277	92	80 - 120	2013-07-23	

#### Standard (CCV-2)

QC Batch:	103326			Analy	zed By: KC				
					$\mathrm{CCVs}$	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	$\operatorname{Limits}$	Analyzed
Benzene			1	mg/kg	0.100	0.0912	91	80 - 120	2013-07-23
Toluene			1	mg/kg	0.100	0.0909	91	80 - 120	2013-07-23
Ethylbenzene	е		1	mg/kg	0.100	0.0890	89	80 - 120	2013-07-23
Xylene			1	mg/kg	0.300	0.269	90	80 - 120	2013-07-23

#### Standard (CCV-3)

QC Batch: 103	326	Date Analyzed: 2013-07-23							zed By: KC
					CCVs True	CCVs Found	CCVs Percent	Percent	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene			1	mg/kg	0.100	0.0901	90	80 - 120	2013-07-23
Toluene			1	mg/kg	0.100	0.0902	90	80 - 120	2013-07-23
Ethylbenzene			1	mg/kg	0.100	0.0888	89	80 - 120	2013-07-23
Xylene			1	mg/kg	0.300	0.269	90	80 - 120	2013-07-23

## Appendix

#### **Report Definitions**

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
$\operatorname{SDL}$	Sample Detection Limit

#### Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-12-4	Midland

#### Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

#### **Result Comments**

Report Date: July 24, 2013 112MC05530 Work Order: 13071701 COG/Moncrief Page Number: 21 of 21 Eddy Co., NM

1 Dilution due to hydrocarbons.

#### Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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CLIENT NAM	ME: COG						SITE	MANA Ik	GER:	: TAVA R	+2			NERS	T	PRE	SEF	RVATI	VE		DIXI	s Ba C	s Ba C			60/624	270/625					ns, pH,		
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Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Report Date: January 15, 2014

13123126

Work Order:

## **Summary Report**

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Project Location: Eddy Co., NM Project Name: COG/Moncrief Project Number: 112MC05530

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
350421	T-1 (0')	soil	2013-12-12	00:00	2013-12-30
350422	T-1 (2')	soil	2013-12-12	00:00	2013-12-30
350423	T-1 (3')	soil	2013-12-12	00:00	2013-12-30
350424	T-2 (0')	soil	2013-12-12	00:00	2013-12-30
350425	T-2 (2 <sup>*</sup> )	soil	2013-12-12	00:00	2013-12-30
350426	T-2 (3')	soil	2013-12-12	00:00	2013-12-30

#### Sample: 350421 - T-1 (0')

Param	Flag	Result	Units	$\operatorname{RL}$
Chloride	Qs	846	mg/Kg	5

#### Sample: 350422 - T-1 (2')

Param	Flag	Result	$\mathbf{Units}$	$\operatorname{RL}$
Chloride	Qs	2100	mg/Kg	5

#### Sample: 350423 - T-1 (3')

Param	Flag	Result	$\mathbf{Units}$	$\mathbf{RL}$
Chloride	Qa	949	mg/Kg	5

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

#### Report Date: January 15, 2014

#### Sample: 350424 - T-2 (0')

Param	$\mathbf{Flag}$	Result	Units	$\mathbf{RL}$
Chloride	QN	26400	mg/Kg	5

#### Sample: 350425 - T-2 (2')

Param	Flag	$\operatorname{Result}$	Units	$\operatorname{RL}$
Chloride	Qu	15400	mg/Kg	5

#### Sample: 350426 - T-2 (3')

Param	Flag	$\operatorname{Result}$	Units	$\mathbf{RL}$
Chloride	Qs	12600	mg/Kg	5



6701 Aberdeen Avenue, Suite 9 200 East Sunsel Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Texas 79424 Lubbock. El Paso, Midland. Carroliton.

800-378-1296 Texas 79922 Texas 79703 Texas 75006 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

**NELAP** DoD LELAP Kansas Oklahoma ISO 17025 WBE HUB **NCTRCA** DBE

## Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

**Report Date:** January 15, 2014

FAX 806 • 794 • 1298

FAX 915 - 585 - 4944

FAX 432-689-6313

Work Order: 13123126

806-794-1296

915-585-3443

432+689+6301

972-242-7750

Eddy Co., NM Project Location: **Project Name:** COG/Moncrief **Project Number:** 112MC05530

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
350421	T-1 (0')	soil	2013-12-12	00:00	2013-12-30
350422	T-1(2)	soil	2013-12-12	00:00	2013-12-30
350423	T-1 (3')	soil	2013-12-12	00:00	2013-12-30
350424	T-2 (0')	soil	2013-12-12	00:00	2013-12-30
350425	T-2 (2')	soil	2013-12-12	00:00	2013-12-30
350426	T-2 (3')	soil	2013-12-12	00:00	2013-12-30

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 11 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael Abril

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

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## Case Narrative

Samples for project COG/Moncrief were received by TraceAnalysis, Inc. on 2013-12-30 and assigned to work order 13123126. Samples for work order 13123126 were received intact at a temperature of 5.7 C.

Samples were analyzed for the following tests using their respective methods.

		$\operatorname{Prep}$	$\mathbf{Prep}$	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	91293	2013-12-30 at 10:00	108328	2014-01-15 at 12:30

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13123126 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

## **Analytical Report**

#### Sample: 350421 - T-1 (0')

Chloride	Qa		846	mg/Kg	5	5.00
Parameter	Flag	Cert	RL Result	Units	Dilution	$\operatorname{RL}$
QC Batch: Prep Batch:	108328 91293	Date An Sample	alyzed: Preparation:	2014-01-15 2013-12-30	Analyzed By: Prepared By:	$\begin{array}{c} \mathrm{GS} \\ \mathrm{GS} \end{array}$
Laboratory: Analysis:	Lubbock Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A

#### Sample: 350422 - T-1 (2')

Parameter Chloride	Flag Q₅	Cert	Result 2100	Units mg/Kg	Dilution 5	RL 5.00
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (Titration) 108328 91293	Analytic Date An Sample	al Method: alyzed: Preparation: RL	SM 4500-Cl B 2014-01-15 2013-12-30	Prep Method: Analyzed By: Prepared By:	N/A GS GS

#### Sample: 350423 - T-1 (3')

Chloride	Qĸ		949	mg/Kg	5	5.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	91293	Sample Preparation: 2013-12-30		Prepared By:	$\mathbf{GS}$	
QC Batch:	108328	Date A	Analyzed:	2014-01-15	Analyzed By:	GS
Laboratory: Analysis:	Lubbock Chloride (Titration)	Analyt	tical Method:	SM 4500-Cl B	Prep Method:	N/A

Report Date 112MC05530	: January 15, 2014	V 15, 2014 Work Order: 13123126 COG/Moncrief			Page Number: 6 of 11 Eddy Co., NM						
Sample: 35	Sample: 350424 - T-2 (0')										
Laboratory:	Lubbock										
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A						
QC Batch:	108328	Date Analyzed:	2014-01-15	Analyzed By:	GS						
Prep Batch:	91293	Sample Preparation	n: 2013-12-30	Prepared By:	$\operatorname{GS}$						
		R	L								
Parameter	Flag	Cert Resu	lt Units	Dilution	$\mathbf{RL}$						
Chloride	Qu	2640	0 mg/Kg	50	5.00						
Sample: 35	0425 - T-2 (2')										
Laboratory:	Lubbock										
Analysis:	Chloride (Titration)	Analytical Method	SM 4500-Cl B	Prep Method:	N/A						
OC Batch:	108328	Date Analyzed:	2014-01-15	Analyzed By:	GS						
Prep Batch:	91293	Sample Preparation	n: 2013-12-30	Prepared By:	GS						
		R	T,								

Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	Qu		15400	mg/Kg	50	5.00

#### Sample: 350426 - T-2 (3')

-						
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (Titration) 108328 91293	Analytic Date An Sample 1	al Method: alyzed: Preparation:	SM 4500-Cl B 2014-01-15 2013-12-30	Prep Method: Analyzed By: Prepared By:	N/A GS GS
			$\operatorname{RL}$			
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	$\mathbf{RL}$
Chloride	Qa		12600	mg/Kg	50	5.00
						_

.

## Method Blanks

Method Bla	unk (1)	QC Batch: 108328				
QC Batch: Prep Batch:	$108328 \\ 91293$		Date Analyzed: QC Preparation:	2014-01-15 2013-12-30	Analyzed By: Prepared By:	$\operatorname{GS}$
				MDL		
Parameter		Flag	Cert	Result	Units	$\operatorname{RL}$
Chloride				<3.05	mg/Kg	5

## Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

Chloride

QC Batch: Prep Batch:	108328 91293	Date Analyzed: 2014-01-15 QC Preparation: 2013-12-30							Analyzed By: GS Prepared By: GS			
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix sult	Rec.	Rec. Limit	
Chloride				99.0	mg/Kg	1	100	<	3.05	99	85 - 115	
Percent recov	very is based on the spik	e rest	ılt. RPD	is based o	on the sp	pike and sp	oike duplic	ate resu	ılt.			
			LCSD			Spike	Matrix		Rec.		RPD	
Param	$\mathbf{F}$	С	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	$\operatorname{RPD}$	Limit	
Chloride			100	mg/Kg	1	100	<3.05	100	85 - 115	1	20	
Percent recov	very is based on the spik	e rest	lt. RPD	is based o	on the sp	oike and sp	oike duplic	ate resi	ılt.			

#### Matrix Spike (MS-1) Spiked Sample: 350426 QC Batch: 108328 Date Analyzed: 2014-01-15 Analyzed By: GSPrep Batch: 91293QC Preparation: 2013-12-30 Prepared By: GSMS Spike Rec. Matrix F С Param Result Units Dil. Result Rec. Limit Amount Chloride 13100 mg/Kg 50 500 12600 100 80 - 120 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. MSD RPD Spike Matrix Rec. Param $\mathbf{F}$ С Result Units Dil. Amount Result Limit RPD Limit Rec.

mg/Kg

50

500

12600

40

80 - 120

2

20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

12800

Qn Qs

## **Calibration Standards**

#### Standard (ICV-1)

QC Batch:	108328			Date A	Analyzed:	2014-01-15		Analy	zed By: GS
					ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	$\mathbf{F}$ la	ŧg	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				nıg/Kg	100	99.0	99	85 - 115	2014-01-15

#### Standard (CCV-1)

QC Batch:	108328			Date .	Analyzed:	2014-01-15		Analyzed By: GS				
			Que	The Star	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date			
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed			
Chloride				mg/Kg	100	101	101	85 - 115	2014-01-15			

## Appendix

#### **Report Definitions**

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

#### Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
~	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704219-13-9	Lubbock

#### **Standard Flags**

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

#### Attachments

Report Date: January 15, 2014 112MC05530 Work Order: 13123126 COG/Moncrief

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Page Number: 11 of 11 Eddy Co., NM

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

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Analysis Request of Chain of Custody Record												
	ANALYSIS REQUEST (Circle or Specify Method No.)											
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CLIENT NAME:	SITE MANAGER: I Ke Tavarez		ATIVE	TX10	s Ba		260/624			ns. pH,		
PROJECT NO .: PROJECT N 112-105530 (06)	Noncnief Stale #1	CONTA		MOD.	s Ag A	os /olatile	8240/8;	8 608	5	Air) tos) s/Catio		
LAB I.D. NUMBER DATE TIME TIME AWOOD	Eddy (0 NAS SAMPLE IDENTIFICATION	NUMBER OF FILTERED (N HCL HCL HNO3	NONE	BTEX 8021E TPH 8015	PAH 8270 RCRA Metal TCLP Metal	TCLP Volati	GC.MS Vol.	PCB's 8080/ Pest. 808/60	Chloride Gamma Spe	Alpha Beta ( PLM:(Asbes Maior Anion		
157421 12/12 5 X.	T-1 (0')	ı							x			
422 3 4	(2')							·	X			
423 5 4	(3')	1							X			
424 5 74-	T-2 (0')								X			
725 S F	(2')	)							<u>x</u>			
424 S H	[3')								X			
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	AH3 (South Side wall)								$\leftarrow$	╧┿┿╋	╆┼╋	+
	HM 4 (Bottom Hole 5)								d H		╘┼┼	$\downarrow$
	Tot (AH-3 Surface)					+++	++		++		+++	1
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