PJXK 153555 3374

District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Azicc, NM 87410

District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

Name of Company COG Operating LLC

State of New Mexico Energy Minerals and Natural Resources

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

HOBBS OCD

4951 Form C-141 Revised October 10, 2003

Final Report

JUL 0 1 2015 ubmit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

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Initial Report

Release Notification and Corrective Action

OPERATOR

Contact Pat Ellis

			00 Midla	nd, Texas 7970	1		No. (432) 685-4	332		
Facility Nar	ne GC Fe	deral #13			·	Facility Typ	e Well		•	
Surface Ow	ner: Feder	al		Mineral C)wner					. NMLC-029405B -025-39109
				LOCA	TIO	N OF REI	LEASE			
Unit Letter N	Section 19	Township 17S	Range 32E	Feet from the 575	Nort	h/South Line South	Feet from the 1915	East/West Lin West	ne C	County Lea
]	Latitude N 32.8	31443	° Longitude	e W 103.80842			
				NAT	URE	OF RELI	EASE			
Type of Rele							Release 23 bbls			covered 20 bbls
Source of Re	lease Flowl	ine				Date and H 12/23/10	our of Occurrence			our of Discovery
Was Immedia	ate Notice (Given?		•		If YES, To	Whom?	12/23/	10	1:00 p.m.
			Yes [No 🖾 Not Re	equired					
By Whom?						Date and H	our			
Was a Water	course Read		_				lume Impacting th	ne Watercourse	.	
			Yes 🛛] No		N/A				
If a Watercou	irse was Im	pacted, Descri	ibe Fully.*			<u>. L</u>				
N/A										
Describe Cau	Describe Cause of Problem and Remedial Action Taken.*									
The GC Fede	eral #13 flov	vline ruptured	on the par	d location. The ru	ıptured	l part of the flo	wline had been cu	t out and repla	ced wi	ith new poly.
Describe Are	a Affected :	and Cleanup A	Action Tak	ten.*		•				· · · · · · · · · · · · · · · · · · ·
										ed and hauled away for submitted to NMOCD for
regulations al public health should their o	If operators or the envir operations homent. In a	are required to conment. The ave failed to a ddition, NMC	report an acceptance dequately ICD accep	id/or file certain re te of a C-141 repo investigate and re	elease in the second of the se	notifications an ne NMOCD ma te contamination	d perform correct orked as "Final Re on that pose a thre the operator of re	ive actions for port" does not at to ground w esponsibility fo	releas relieve ater, si or com	nt to NMOCD rules and les which may endanger e the operator of liability urface water, human health upliance with any other
							OIL CONS	ERVATIO	N D	IVISION
Signature:										
Printed Name	: Ike Tavar	ez (agent for (COG)			Approved by	District Superviso	r:		
Title: Project	Manager					Approval Date	<u>:</u>	Expirati	on Dat	te:
E-mail Addre	ess: ike.tava	rez@tetratech	.com_			Conditions of	Approval:			Attached
Date:				(432) 686-3023						
Attach Addi	tional Shee	ts If Necess	arv							

District 1 1625 N. French Dr., Hobbs, NM 88240 District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised October 10, 2003

Oil Conservation Division 1220 South St. Francis Dr.

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				9:	anta i	e, NW 8/3	005	RE	CEIVED				
			Rel	ease Notific	catio	n and Co	orrective A	ction					
						OPERA'	TOR		Initi	al Report		Fina	il Repor
Name of C	ompany	COG OF	ERATIN	IG LLC		Contact		at Ellis	K ⁻⁷ 7111	ur respon			- 1 (op 0)
Address				dland, TX 7970)1	Telephone	No. 432-	230-007	77				
Facility Na	me	GC F	ederal #1	3		Facility Typ	oe	Well					
Surface Ov	mer Fe	deral		Mineral (Owner				Lease ?	Vo. NML	Č-029	405B	
												25-391	109
				LOCA	ATIC	N OF RE	LEASE						-
Unit Letter	Section	Township	Range	Feet from the	Nort	h/South Line	Feet from the		est Line	County			
N	19	17S	32E	575		South	1915	V	Vest		Lea		
				Latitude 32 NAT		OF REL							
Type of Rele							Release 23			Recovered			
Source of Re	elease Flo	wline				12/23/2010	Iour of Occurrent	e	12/23/201	Hour of Dis 10 1:00 p		У	
Was Immedi	ate Notice (If YES, To							
			Yes 🛚	No 🛛 Not R	equirec	i							
By Whom?						Date and I							
Was a Water	course Read	hed?	Yes 🛚	No		If YES, Ve	olume Impacting t	the Wate	rcourse.				
If a Waterco	urse was Im	pacted, Descr	ibe Fully.	<u> </u>						1			
Describe Ca	use of Probl	em and Reme	dial Actio	n Taken.*					_				
The GC Fed	eral #13 flov	vline ruptured	on the pa	d location. The r	uptured	d part of the flo	wline has been c	ut out and	d replaced	with new p	oly.		
Describe Are	a Affected	and Cleanup	Action Tal	(en.*									
Initially 23bl measured 20 spill site area	ols of productions of productions of productions of the production	ced fluid was yards all on th	released fine pad locale contamin	rom the ruptured ation. The pad ha ation from the re	s been	scraped and sa	turated material v	vas haule	d to dispo	sal. Tetra T	Tech w	ill samp	
regulations a public health should their or the enviro	ll operators or the enviro operations h nment. In a	are required to ronment. The ave failed to a	o report ar acceptant adequately OCD accep	e is true and comp ad/or file certain rate of a C-141 report investigate and ratance of a C-141	elease ort by t emedia	notifications as he NMOCD mate contaminati	nd perform correct arked as "Final R on that pose a thr	ctive action eport" do eat to gro	ons for releases not releases not releases to the contract of	eases which ieve the ope r, surface w	n may e erator c rater, h	endange of liabili uman h	er ity iealth
]				\rightarrow			OIL CON	SERV	ATION	DIVISIO	<u>NC</u>		_
Signature:		/	T			,							•
Printed Nam	e:	Josh	Russo			Approved by	District Supervis	or:					
Title:		HSE C	oordinator			Approval Dat	е;	E	xpiration	Date:			
E-mail Addre	ess:	jrusso@cono	horesourc	es.com		Conditions of	Approval:			Attached	ı 🗆		

432-212-2399

01/14/2010

Date:

^{*} Attach Additional Sheets If Necessary

District I 625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

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

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Form C-141 Revised October 10, 2003

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

Release Notification and Corrective Action **OPERATOR** ☐ Initial Report Final Report Name of Company COG Operating LLC Contact Pat Ellis Telephone No. (432) 685-4332 Address 550 W. Texas, Suite 1300 Midland, Texas 79701 Facility Name GC Federal #13 Facility Type Well Surface Owner: Federal Lease No. NMLC-029405B Mineral Owner (API#)30-025-39109 LOCATION OF RELEASE Unit Letter Feet from the North/South Line Feet from the East/West Line Section Township County Range 1915 West Lea 19 575 South 17S 32E Latitude N 32.81443° Longitude W 103.80842° NATURE OF RELEASE Type of Release: Produced Fluids Volume of Release 12 bbls Volume Recovered 10 bbls Source of Release Flowline Date and Hour of Occurrence Date and Hour of Discovery 7/12/10 7/12/10 11:40 a.m. Was Immediate Notice Given? If YES, To Whom? ☐ Yes ☐ No ☒ Not Required By Whom? Date and Hour Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. ☐ Yes 🛛 No N/A If a Watercourse was Impacted, Describe Fully.* N/A Describe Cause of Problem and Remedial Action Taken.* The flowline from the GC Fedeal #13 well ruptured. The flowline has been repaired and put back into service. Describe Area Affected and Cleanup Action Taken.* Tetra Tech inspected site and collected samples to define spills extents. The impacted soil with elevated chlorides 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 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. OIL CONSERVATION DIVISION Signature: Approved by District Supervisor: Printed Name: Ike Tavarez (agent for COG) **Expiration Date:** Approval Date: Title: Project Manager E-mail Address: ike.tavarez@tetratech.com Conditions of Approval: Attached Phone: (432) 686-3023

District 1 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources

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Form C-141 Revised October 10, 2003

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 JUL 0 1 2011 Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

DECEIVED

Release Notification and Corrective Action

						OPERA	ΓOR		Initi	al Report		Final Repor
Name of Co		COG OP				Contact		at Ellis				
Address				dland, TX 7970		Telephone i		230-00	77 <u> </u>			
Facility Na	me	GC Fed	leral #13			Facility Typ	<u>je</u>	Well				
Surface Ow	mer Fe	ederal		Mineral (Owner				Lease N	No. NMLe APJ#		Ю5В -39109
				LOCA	ATION	OF RE	LEASE					
Unit Letter N	Section 19	Township 17S	Range 32E	Fect from the 575		South Line South	Feet from the 1915		Vest Line Vest	County	Lea	
				Latitude 32		Longitu OF REL	ide 103 48.495					
Type of Rele	ease Provi	luced Fluids	····	INAI	UKE		Release 12bbls		Volume (Recovered	10hhis	· · · · · · · · · · · · · · · · · · ·
Source of Re		owline	<u></u>				lour of Occurrence	е		Hour of Dis	scovery	
Was Immedi	ate Notice (Yes 🛭	No 🛭 Not R	equired	If YES, To	Whom?					
By Whom?						Date and I						
Was a Water	course Read		Yes 🛭] No		If YES, Vo	olume Impacting t	he Wate	ercourse.			
If a Waterco.	urse was Im	pacted, Descr	be Fully.	k								
Describe Car	use of Probl	em and Reme	lial Action	n Taken.*								
The flowline	from the G	C Federal #13	well rupt	ured. The flowlin	ne has be	en repaired a	nd put back into s	service.				
Describe Are	ea Affected	and Cleanup A	Action Tal	cen.*								
location. The of any oil in remediation	e dimension this release work plan to	is of the spill a is 37. Tetra T o the NMOCE	rea were ech will s / BLM fo	15' x 50'. The prample the spill sit or approval prior to	oduced version of the second contract of the	water in this a delineate an gnificant rem		de conce nination	entration o from the re	f 135,000 m elease and w	ig/l. The e will p	e oil gravity resent a
regulations a public health should their or the enviro	all operators n or the envi- operations h nment. In a	are required to ronment. The nave failed to a	o report ar acceptance dequately ICD accep	nd/or file certain rece of a C-141 report investigate and r	elease no ort by the emediate	otifications a e NMOCD m e contaminati	knowledge and used perform correct arked as "Final Rich that pose a three the operator of	tive acti eport" d eat to gr	ons for rel oes not rel ound wate	eases which ieve the ope r, surface wa	may en rator of ater, hur	danger Tiability man health
		, <u> </u>		•		<u>-</u>	OIL CON	SERV	ATION	DIVISIO	<u>NC</u>	
Signature:	_/			<u></u>			5 1					
Printed Nam	e: (Josh	Russo			Approved by	District Supervis	or:			· · · · -	
Title:		HSE C	ordinator			Approval Da	te:		Expiration	Date:		
E-mail Addr	ess:	jrusso@conc	horesourc	es.com		Conditions o	f Approval:			Attached		
Date: 07/16/ Attach Addi		Phone Phone Phone		-212-2399					<u> </u>			

	_	SI	TE INFORMATI	ON		
		Rep	ort Type: Work	r Plan		
General Site Inf	ormation:			THE STATE OF THE S		
Site:			#13 (Well Site)			
Company:		COG Operat	ing LLC			
Section, Towns	hip and Range	Section 19,	Γ17S, R32E, Unit N			
Lease Number:		30-025-3910	9			
County:		Lea County				
GPS:	_		32.81443	103.80842		
Surface Owner:		Federal				
Mineral Owner:				CR 126, go North on CR 126 for 1.8 miles, turn left		
		(west) into leas	se road and go 2.5 miles	to Site.		
	se Data:		Spill #1	Spill #2		
Date Released:	ate Released:		7/12/2010	12/23/2010		
Type Release: Produced Water		Produced Water				
	of Contamination: Flow line Flow line					
Fluid Released:			12 barrels	23 barrels		
Fluids Recovered		10 barrels 20 barrels				
Official Commu	nication:					
Name:	Pat Ellis			lke-Tavarez		
Company:	COG Operating, L	LC		Tetra Tech		
Address:	550 W. Texas Ave	e. Ste. 1300		1910 N. Big Spring		
P.O. Box						
City:	Midland Texas, 79	1701		Midland, Texas		
Phone number:	(432) 686-3023			(432) 682-4559		
Fax:	(432) 684-7137					
	_1, .5-, 55		I			

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	0
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
₩	CANCELLA LES BESSERVA MA CONTRA CONTR	RECEIVED

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

MAR 2 3 2011 HOBBSOCD

approved Jehm J HUNDO, HOBBS



March 17, 2011

RECEIVED

Mr. Geoffrey Leking Environmental Engineer Specialist Oil Conservation Division, District 1 1625 North French Drive Hobbs, New Mexico 88240 MAR 2 3 2011 HOBBSOCD

Re: Work Plan for the COG Operating LLC., GC Federal #13 Well Site, Unit N, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico.

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the GC Federal #13 Well Site, Unit N, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.81443°, W 103.80842°. The site location is shown on Figures 1 and 2.

Background (2 Spills)

According to the State of New Mexico C-141 Initial Reports, the first leak was discovered on July 12, 2010 and released approximately twelve (12) barrels of produced water, due to a flow line rupture. Ten (10) barrels of standing fluids were recovered from the site. The spill was contained on the well pad location measuring approximately 15' x 50'. On December 23, 2010, the second leak occurred on the flow line releasing 23 barrels of produced water and 20 barrels of fluid were recovered. The fluid remained on the pad and measuring approximately 55' x 65', which encompassed the foot print of the first spill. The two initial C-141 forms are enclosed in Appendix C.



Groundwater

On July 14, 2009, Tetra Tech installed a temporary monitor well in Section 30 to establish a depth to water in the area. The well was installed to a total depth of 180' below surface. The well was gauged and found no groundwater in the well (dry). According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 100' below surface. The average depth to groundwater and well log are shown in Appendix A.

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

Spill #1

On August 16, 2010, Tetra Tech personnel inspected and sampled the spill area. The spill area measured approximately 15' x 65'. Due to the limited impacted area, two (2) auger holes (AH-1 and AH-3) were installed using a stainless steel hand auger to assess the impacted soils. Select 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 B. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the submitted samples at 0-1' were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the shallow soils (0-1') in both auger holes locations.



Spill #2

On December 23, 2010, Tetra Tech inspected and sampled the spill area. The second spill was larger and encompassed the first spill foot print. The spill area measured approximately 55' x 65'. A total of four (4) auger holes were installed to assess the spill area. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B. The sampling results are summarized in Table 2. The auger hole locations are shown on Figure 3.

Referring to Table 2, none of the samples at 0-1' exceeded the TPH and BTEX RRAL. Auger holes AH-1 and AH-3 showed chloride concentrations at 0-1' of 990 mg/kg and 2,160 mg/kg, respectively. The deeper samples were below the laboratory reporting limit. The remaining auger holes AH-2 and AH-4 did not show a chloride impact to the area.

Work Plan

COG proposes to remove the elevated chloride impacted soil. Based on the Spill #2 data, the areas of AH-1 and AH-3 will be excavated to a depth of approximately 1.0' below surface, as shown in Table 2. Once the elevated chlorides are removed, the excavation will be backfilled with clean soil.

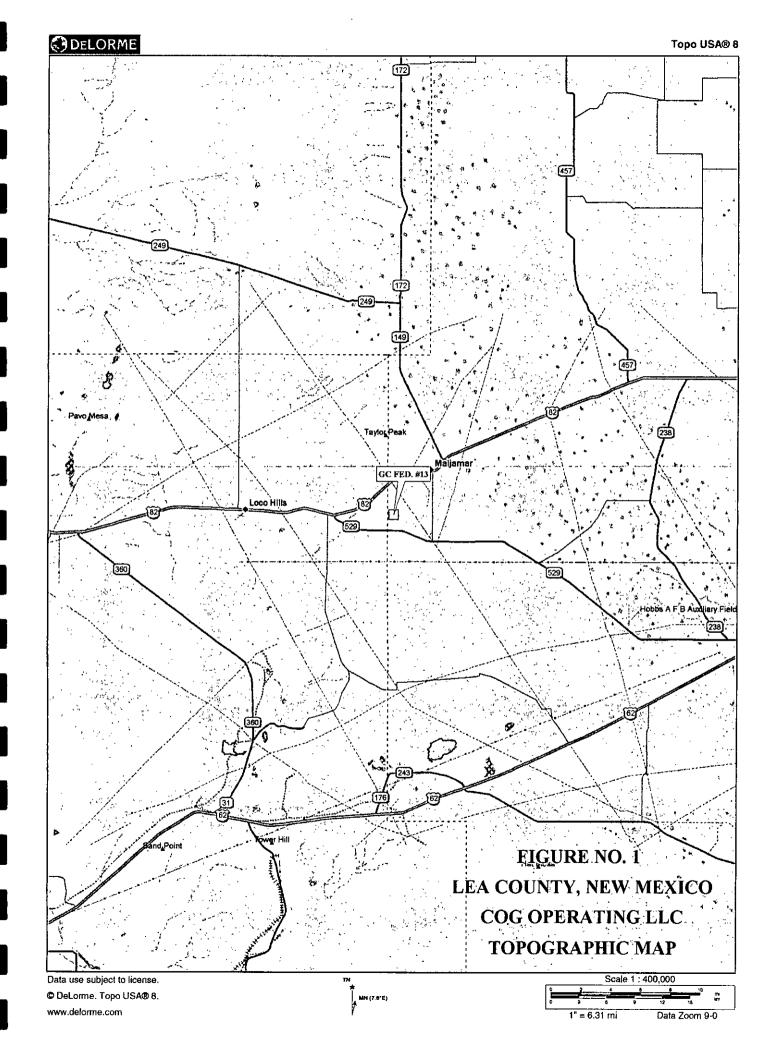
If the impacted soil is around oil and gas equipment, structures or lines, the impacted soils may not be feasible or practicable to be removed due to safely concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable.

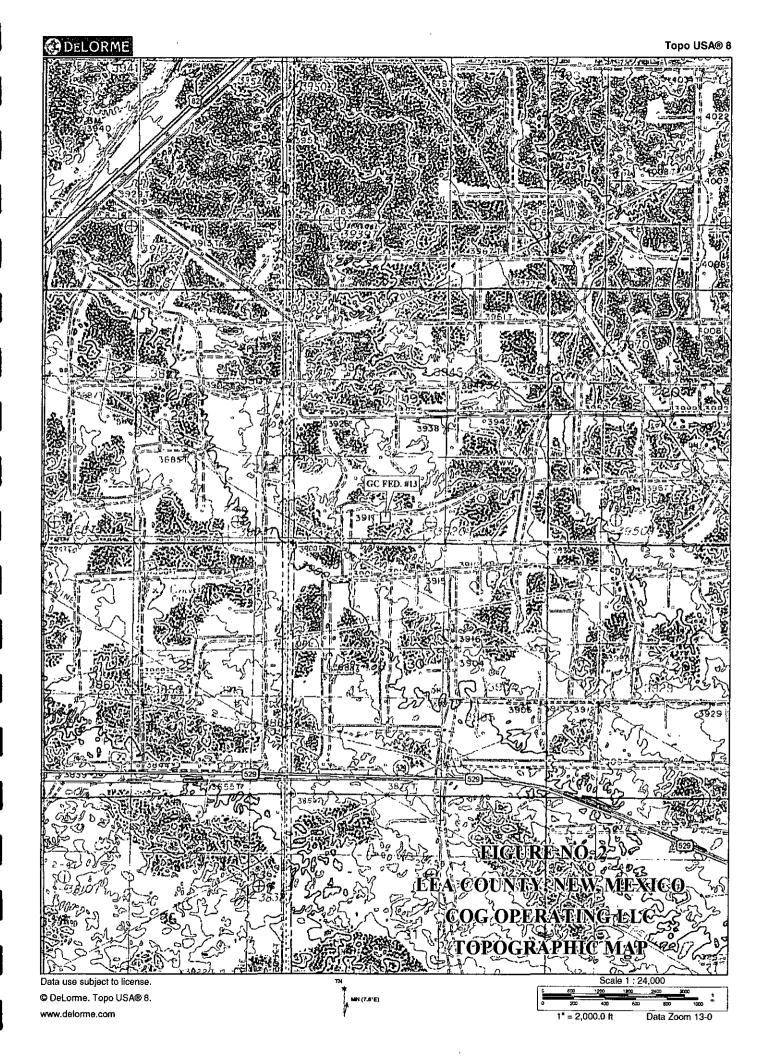
Upon completion, a final report will be submitted to the NMOCD. If you have any questions or require any additional information regarding this work plan proposal, please call me at (432) 682-4559.

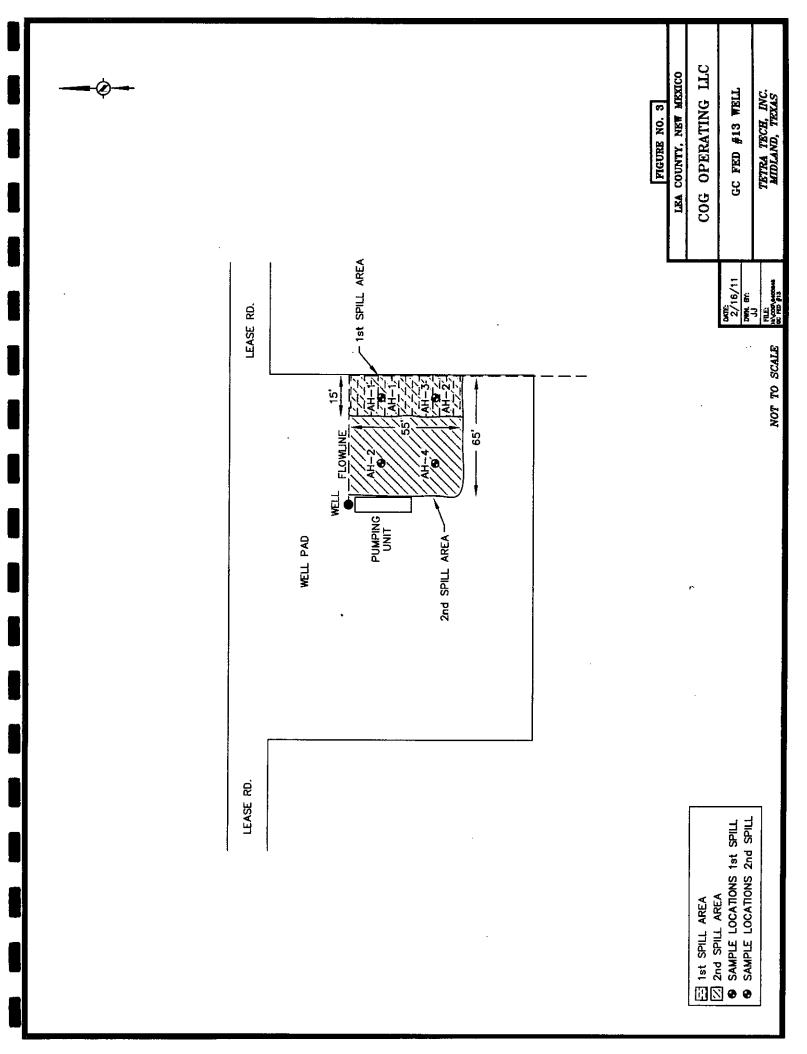
Respectfully submitted,

TETRA TEĆH

Project Manager







COG Operating LLC. GC FEDERAL #13 LEA COUNTY, NEW MEXICO Table 1

Sample	Sample	Sample	Depth	Soil 5	Soil Status	ΤP	TPH (mg/kg)	(£	Benzene	Toluene	Ethlybenzene	Xvlene	Chloride
Q	Date	Depth (ft) (BEB	(BEB)	In-Situ	In-Situ Removed	GRO	DRO	Total	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)
AH-1	8/16/2010	0-1,		×		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	3,920
	교	1-1.5		×									573
	E	2-2.5		×									<200
AH-2	8/16/2010	0-1,		×		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	1,440
	=	1-1.5		×									433
	=	2-2.5		×									594
	=	3-3.5'		×									<200
	ш	4-4.5'		×									<200

Below Excavation Bottom Not Analyzed

BEB (-)

LEA COUNTY, NEW MEXICO Table 2
COG Operating LLC.
GC FEDERAL #13

Sample	Sample	Sample	Depth	Soil :	Soil Status	TE	TPH (mg/kg)	3) [Benzene	Toluene	Ethlybenzene	Xylene	Chloride
Ω	Date	Depth (ft)	(BEB)	In-Situ	In-Situ Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	2/16/2011	0-1,		×		<2.00	<50.0	<50,0	<0.0200	<0.0200	<0.0200	<0.0200	266
 		1-1.5		×		•	-	٠,	,	ı	1	-	<200
	=	2-2.5		×		-	-	1	1	•	•	-	<200
AH-2	2/16/2011	0-1,		×		<2.00	0.05>	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<200
	±	1-1.5'		×		_	-	,	ı	•	,	-	<200
		2-2.5'		×		-	-	ı	-		ŀ	1	<200
				i			,		:				
AH-3	2/16/2011	0-1.		×		<2.00	82.7	82.7	<0.0200	<0.0200	<0.0200	<0.0200	2,160
	=	1-1.5		×		•	,	-		•	•	-	<200
		2-2.5'		×		1	ŀ	•	-	•	-	1	<200
									Ī				
AH-4	2/16/2011	0-1,		×		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<200
	=	1-1.5		×			ı	١.	-	ŀ	•	-	<200
		2-2.5		×		-	1	-	•	1	-	•	233

Below Excavation Bottom Not Analyzed Proposed Excavation Depths

Water Well Data Average Depth to Groundwater (ft) COG - GC Federal #13 Lea County, New Mexico

	16	South	;	31 East	ì
6	5	4	3	2	1
7	8	9	10	11	12 288
18	17	16	15	14	13 113
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
290	l				

290					
	17	South	;	31 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	26	25
31	32	33	34	35	36

	18	South	;	31 East	
6	5	4	3	2	1
7	8	9	10	11	12 400
18	17	16	15	14 317	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35 261	36

	16	South	;	32 East	
6	5	4	3	2	1
	1		65	265	265
7	8	9	10	11	12
	1				215
18	17	16	15	14	13
	l	221	1		215
19	20	21	22	23	24
220	İ	210	1	210	
30	29	28	27	26	25
				243	
31	32	33	34	35	36
				Ì	260

	17 Sc	outh	32	East	
6	5	4 82	3 175	2 60	1 225
7	8	9	10	11 70 88	12
18	17	16	15	14	13
19 Site	20	21	22	23	24
30 1 78	29	28	27	26	25
31	32	33	34	35	36

	18 Sc	outh	32	East	
6	5	4 65	3	2	1
7 460 82	8	9	10	11	12
18	17	16 84	15	14	13
19	20 164	21	22 429	23	24
30	29	28	27	26	25
31	32	33	34 117	35	36

	16 South		33	33 East		
6	5 180	4	3 130	2	1	
	1	150		148	142	
7	8	9	10	11	12	
	200		182		142	
18	17	16	15	14	13	
	182	180	175	143	110	
19	20	21	22	23	24	
	1			120	ŀ	
30	29	28	27	26	25	
191		190	130	143	120	
31	32	33	34	35	36	
190	168		160			

	17 South			33 East		
6 90	5	4	3 155	2 158	1 150	
7 167	8 173	9 161	10	11	12	
18 1 88	17 180	16	15	14	13 165	
19	20 1 90	21	22	23 115	24	
30	29	28	27	26	25	
31	32	33	34	35 155	36	

	18 Sc	outh	33	East	
6	5	4	3	2	1
7	8 100	9	10	11	12 143
		l	62		140
18	17	16	15	14	13
	85			36	60
19	20	21	22	23	24
>140			Ī		195
30	29	28	27	26	25
35					l i
31	32	33	34	35	36
			177		

- 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 well to establish depth to water
- 143 NMOCD Groundwater map well location

SAMPLE LOG

Boring/Well: Project Number:

TMW-1 Dry Well in Sec 30 17S-32E

114-6400224

Client:

COG

Site Location:

Pronghorn Section 30 Lea County, New Mexico

Location:

180

Total Depth Date Installed:

07/14/09

DEPTH (Ft)	ОУМ	SAMPLE DESCRIPTION
5-6		Brown fine grain sand
10-11		Buff limestone
15-16		Tan to buff calcareous sand with chert intermixed.
20-21	**	Tan calcareous sand
25-26		Tan fine grain sand
30-31		Tan to yellow sandy clay
35-36		Reddish clayey sand with gravel
40-41		Red gravelly fine grain sand
45-46		Red to buff gravelly calcareous sand
50-51		Red fine grain sand
55-56		Red sandy silt
60-61		Red silty clay (dry)
65-66		Red coarse grain sandy clay
70-71		Red fine grain sand
75- 76		Red fine grain sand
80-81		Red gravelly sand
85-86	-	Red fine grain silty clay with some sand intermixed
90-91	<u></u>	Red fine grain silty clay with some sand intermixed
95-96		Red fine grain silty clay with some sand intermixed
100-101		Red fine grain silty clay with some sand intermixed
105-106		Tan red fine grain sand
110-111		Tan fine grain sand
115-116		Tan fine grain sand
120-121		Tan to red fine grain sand
130-131		Red clay of high plasticity (Red bed)
140-141		Red clay of high plasticity (Red bed)
150-151		Red clay of high plasticity (Red bed) intermixed with gravel
160-161		Red clay of high plasticity (Red bed) intermixed with gravel
170-171		Red clay of high plasticity (Red bed) intermixed with gravel
180-181		Red clay of high plasticity (Red bed)

Total Depth is 181 feet

Groundwater was not encountered

Page Number: 1 of 2

Summary Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street

Report Date: August 25, 2010

Midland, TX 79705 Work Order: 10081706

Project Location: Lea County, NM Project Name: COG/GC Federal #13

Project Number: 114-6400646

		•	Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
$24\overline{1460}$	AH-1 0-1'	soil	2010-08-16	00:00	2010-08-16
241461	AH-1 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241462	AH-1 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241463	AH-2 0-1'	soil	2010-08-16	00:00	2010-08-16
241464	AH-2 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241465	AH-2 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241466	AH-2 3-3.5'	soil	2010-08-16	00:00	2010-08-16
241467	AH-2 4-4.5'	soil	2010-08-16	00:00	2010-08-16

	BTEX			TPH DRO - NEW	TPH GRO	
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
241460 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	<2.00
241463 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00

Sample: 241460 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		3920	mg/Kg	4.00

Sample: 241461 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		573	mg/Kg	4.00

Chloride	Report Date: August 25, 2010		Work Order: 10081706	Page	Number: 2 of 2
Chloride	Sample: 241462 -	- AH-1 2-2.5'			
Chloride	Param	Flag	Result	Units	RL
Param Flag Result Units R Chloride 1440 mg/Kg 4.4 Sample: 241464 - AH-2 1-1.5' Param Flag Result Units R Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Param Flag Result Units R Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Param Flag Result Units R Chloride <200	Chloride		<200	mg/Kg	4.00
Chloride 1440 mg/Kg 4.0 Sample: 241464 - AH-2 1-1.5' Param Flag Result Units Result Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Param Flag Result Units Result Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Param Flag Result Units Result Chloride <200	Sample: 241463 -	- AH-2 0-1'			
Chloride 1440 mg/Kg 4.0 Sample: 241464 - AH-2 1-1.5' Param Flag Result Units Result Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Param Flag Result Units Result Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Param Flag Result Units Result Chloride <200	Param	Flag	Result	Units	RL
Param Flag Result Units R Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Image: Param Flag Result R	Chloride		1440	mg/Kg	4.00
Param Flag Result Units R Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Image: Param Flag Result R			•		
Chloride 433 mg/Kg 4.0 Sample: 241465 - AH-2 2-2.5' Result Units R Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Result Units R Chloride <200	Sample: 241464 -	- AH-2 1-1.5'	1	_	
Sample: 241465 - AH-2 2-2.5' Param Flag Result Units R Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Param Flag Result Units R Chloride <200		Flag			RL
Param Flag Result Units R Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Param Flag Result Units R Chloride <200	Chloride			mg/Kg	4.00
Chloride 594 mg/Kg 4.0 Sample: 241466 - AH-2 3-3.5' Image: 241466 - AH-2 3-3.5' Image: 241467 - AH-2 3	Sample: 241465 -	- AH-2 2-2.5') 		
Chloride 594 mg/Kg 4.6 Sample: 241466 - AH-2 3-3.5' Image: AH-2 3-3.5'	Param	Flag	Result	Units	RL
Param Flag Result Units R Chloride <200	Chloride		594		4.00
Param Flag Result Units R Chloride <200			•		
Chloride <200 mg/Kg 4.6 Sample: 241467 - AH-2 4-4.5' Param Flag Result Units R	Sample: 241466 -	· AH-2 3-3.5'	:		
Sample: 241467 - AH-2 4-4.5' Param Flag Result Units R	Param	Flag	Result	Units	RL
Param Flag Result Units R	Chloride		<200	mg/Kg	4.00
Param Flag Result Units R			f		
<u>v</u>	Sample: 241467 -	AH-2 4-4.5'	· ·		
	Param	Flag	Result	Units	RL
110/116 110	Chloride		<200	mg/Kg	4.00



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1

Lubpock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703

806 • 794 • 1296 800 • 378 • 1296 888 - 588 - 3443 915 • 585 • 3443 FAX 806 • 794 • 1298 FAX 915 • 585 • 4944

6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

432 • 689 • 6301 817 - 201 - 5260 FAX 432 • 689 • 6313

E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019

HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA

WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

LELAP-02003

El Paso:

T104704221-08-TX LELAP-02002

Midland: T104704392-08-TX

Kansas E-10317

Analytical and Quality Control Report

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

Report Date: August 25, 2010

Work Order:

10081706

Project Location: Lea County, NM Project Name:

COG/GC Federal #13

Project Number:

114-6400646

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
241460	AH-1 0-1'	soil	2010-08-16	00:00	2010-08-16
241461	AH-1 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241462	AH-1 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241463	AH-2 0-1'	soil	2010-08-16	00:00	2010-08-16
241464	AH-2 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241465	AH-2 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241466	AH-2 3-3.5'	· soil	2010-08-16	00:00	2010-08-16
241467	AH-2 4-4.5'	soil	2010-08-16	00:00	2010-08-16

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 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Mehan april

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

Standard Flags

 ${\bf B}\,$ - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project COG/GC Federal #13 were received by TraceAnalysis, Inc. on 2010-08-16 and assigned to work order 10081706. Samples for work order 10081706 were received intact at a temperature of 18.0 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	62423	2010-08-21 at 17:00	72813	2010-08-22 at 10:38
Chloride (Titration)	SM 4500-Cl B	62441	2010-08-23 at 09:03	72832	2010-08-23 at 14:43
Chloride (Titration)	SM 4500-Cl B	62442	2010-08-23 at 09:04	72833	2010-08-23 at 14:44
TPH DRO - NEW	S 8015 D	62428	2010-08-20 at 13:56	72812	2010-08-20 at 13:56
TPH GRO	S 8015 D	62423	2010-08-21 at 17:00	72815	2010-08-22 at 11:05

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 10081706 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.

Samples were received on ice.

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.

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 4 of 16 Lea County, NM

Analytical Report

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 72813 Prep Batch: 62423

Analytical Method: S 8021B Date Analyzed: 2010-08-22 Sample Preparation: 2010-08-21 Prep Method: S 5035 Analyzed By: AG Prepared By: AG

RLParameter Flag Result Units Dilution RLBenzene < 0.0200 mg/Kg 1 0.0200 Toluene < 0.0200 mg/Kg 1 0.0200Ethylbenzene < 0.0200 mg/Kg 1 0.0200Xylene < 0.0200 mg/Kg 0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.68	mg/Kg	1	2.00	84	52.8 - 137
4-Bromofluorobenzene (4-BFB)		1.50	mg/Kg	1	2.00	75	38.4 - 157

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)
QC Batch: 72832
Prep Batch: 62441

Analytical Method: SM 4500-Cl B Date Analyzed: 2010-08-23 Sample Preparation: 2010-08-23

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW QC Batch: 72812 Prep Batch: 62428

Analytical Method: S 8015 D
Date Analyzed: 2010-08-20
Sample Preparation: 2010-08-20

Prep Method: N/A Analyzed By: kg Prepared By: kg

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 5 of 16 Lea County, NM

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		104	mg/Kg	1	100	104	70 - 130

Sample: 241460 - AH-1 0-1'

Laboratory:

Midland

Analysis: TPH GRO QC Batch: 72815 Prep Batch: 62423 Analytical Method: S 8015 D.
Date Analyzed: 2010-08-22

Sample Preparation:

2010-08-22 2010-08-21 Prep Method: S 5035 Analyzed By: AG Prepared By: AG

RL

Parameter	Flag	Result	Units	Dilution	RL_{-}
GRO		< 2.00	mg/Kg	1	2.00

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.86	mg/Kg	1	2.00	93	48.5 - 152
4-Bromofluorobenzene (4-BFB)		1.59	mg/Kg	1	2.00	80	42 - 159

Sample: 241461 - AH-1 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration)
QC Batch: 72832
Prep Batch: 62441

Analytical Method: Sl Date Analyzed: 20

Sample Preparation:

SM 4500-Cl B 2010-08-23 2010-08-23 Prep Method: N/A
Analyzed By: AR
Prepared By: AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		573	mg/Kg	50	4.00

Sample: 241462 - AH-1 2-2.5'

62441

Laboratory:

Prep Batch:

Midland

Analysis: Chloride (Titration)
QC Batch: 72832

Analytical Method:
Date Analyzed:
Sample Preparation:

SM 4500-Cl B 2010-08-23 2010-08-23 Prep Method: N/A
Analyzed By: AR
Prepared By: AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

114-6400646

Work Order: 10081706 COG/GC Federal #13

Page Number: 6 of 16

Lea County, NM

Sample: 241463 - AH-2 0-1'

Laboratory: Midland

Analysis: **BTEX** QC Batch: 72813 Prep Batch: 62423

Analytical Method: Date Analyzed:

S 8021B 2010-08-22 Prep Method: S 5035 Analyzed By: AG Prepared By: AG

RI.

		T(L)			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

Sample Preparation: 2010-08-21

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	1	0.943	mg/Kg	1	2.00	47	52.8 - 137
4-Bromofluorobenzene (4-BFB)		0.847	mg/Kg	1	2.00	42	38.4 - 157

Sample: 241463 - AH-2 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72832 Prep Batch: 62441

Analytical Method: Date Analyzed:

SM 4500-Cl B 2010-08-23 Sample Preparation: 2010-08-23

Prep Method: N/A Analyzed By: AR

Prepared By: AR

ъī

		TLL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		1440	mg/Kg	100	4.00

Sample: 241463 - AH-2 0-1'

Laboratory:

Midland

TPH DRO - NEW Analysis: QC Batch: 72812 Prep Batch: 62428

Analytical Method: Date Analyzed:

S 8015 D 2010-08-20 Sample Preparation: 2010-08-20 Prep Method: N/A Analyzed By: kg

Prepared By: kg

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO		< 50.0	mg/Kg	1	50.0

¹SPECIAL-TFT is out of control limits due to an unknown anomaly. However, 4-BFB is within control limits and shows the method to be in control. •

114-6400646

Work Order: 10081706 COG/GC Federal #13

Spike Percent Recovery Result Units Dilution Amount Recovery Limits Surrogate Flag 107 mg/Kg 100 70 - 130 n-Tricosane 107

Sample: 241463 - AH-2 0-1'

Laboratory:

Midland

TPH GRO Analysis: QC Batch: 72815 Prep Batch: 62423

Analytical Method: S 8015 D Date Analyzed: 2010-08-22 Sample Preparation:

Prep Method: S 5035 Analyzed By: AG2010-08-21 Prepared By: AG

RL

Parameter Flag Result Units Dilution RL<2.00 GRO mg/Kg 2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	$egin{array}{c} ext{Recovery} \ ext{Limits} \end{array}$
Trifluorotoluene (TFT)		1.05	mg/Kg	1	2.00	52	48.5 - 152
4-Bromofluorobenzene (4-BFB)		0.908	mg/Kg	1	2.00	45	42 - 159

Sample: 241464 - AH-2 1-1.5'

Laboratory:

Midland

Chloride (Titration) Analysis: QC Batch: 72833 Prep Batch: 62442

Analytical Method: SM 4500-Cl B Date Analyzed: 2010-08-23 Sample Preparation: 2010-08-23

Prep Method: N/A Analyzed By: AR Prepared By: AR

Page Number: 7 of 16 Lea County, NM

RLFlag Result Parameter Units Dilution RL433 mg/Kg Chloride 50 4.00

Sample: 241465 - AH-2 2-2.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72833 Prep Batch: 62442

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2010-08-23 2010-08-23

Prep Method: N/A Analyzed By: ARPrepared By: AR

RL

Result Units RLParameter Flag Dilution 594 Chloride mg/Kg 50 4.00

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 8 of 16 Lea County, NM

Sample: 241466 - AH-2 3-3.5'

Laboratory:

Midland

62442

Analysis:

Chloride (Titration)

QC Batch: Prep Batch: 72833

Analytical Method:

SM 4500-Cl B

Date Analyzed: Sample Preparation:

2010-08-23 2010-08-23 Prep Method: N/A Analyzed By: AR

Prepared By: AR

RL

Flag Parameter Chloride

Result <200

Units mg/Kg Dilution 50 RL

4.00

Sample: 241467 - AH-2 4-4.5'

Laboratory:

Midland

Analysis: QC Batch:

Prep Batch:

Chloride (Titration)

72833 62442

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2010-08-23

2010-08-23

Prep Method: N/A

Analyzed By: AR Prepared By: AR

Parameter Flag Chloride

RLResult <200

Units mg/Kg Dilution 50 RL

4.00

Method Blank (1)

QC Batch: 72812

QC Batch: Prep Batch: 62428

72812

Flag

Date Analyzed:

2010-08-20

Analyzed By: kg

QC Preparation:

Units

2010-08-20

Prepared By: kg

Percent

Recovery

99

RL

Recovery

Limits

70 - 130

Parameter DRO

Flag

Result

Result <14.5

MDL

Dilution

1

Units mg/Kg

Spike

Amount

100

50

Surrogate n-Tricosane

98.6 mg/Kg

Method Blank (1)

QC Batch: 72813

72813 QC Batch: Prep Batch: 62423 Date Analyzed: QC Preparation:

2010-08-22 2010-08-21

Analyzed By: AG

Prepared By:

MDL

Parameter Benzene

Flag

Result < 0.0150

Units mg/Kg RL

0.02

continued ...

Report Date: August 2 114-6400646	Work Order: 10081706 COG/GC Federal #13			Page Number: 9 of 16 Lea County, NM				
method blank continued			3.6	n.				
Danie atau	FJ			DL	Ttota	_		D.F
Parameter	Flag		Res		Units			RL
Toluene			< 0.009		mg/K	-		0.02
Ethylbenzene			<0.00		mg/K			0.02
Xylene		•	< 0.003	900	mg/K	g		0.02
					Spike	Percent	Rec	covery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	\mathbf{L} i	mits
Trifluorotoluene (TFT)		1.83	mg/Kg	1	2.00	92	66.6	5 - 122
4-Bromofluorobenzene (4-BFB)	1.32	mg/Kg	1	2.00	66	55.4	- 132
Method Blank (1) QC Batch: 72815 Prep Batch: 62423	QC Batch: 72815	Date Analy QC Prepai	•	010-08-22 010-08-21		Analyz Prepar		AG AG
_			MDL					
Parameter Flag GRO			Result		Units			RL
		<1.65			mg/Kg	· ·		2
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery		overy mits
Trifluorotoluene (TFT)		2.07	mg/Kg	1	2.00	104	67.6	- 150
4-Bromofluorobenzene (4-BFB)	1.43	mg/Kg	.1	2.00	72	52.4	- 130
Method Blank (1) QC Batch: 72832 Prep Batch: 62441	QC Batch: 72832	Date Analy QC Prepar	ation: 2	010-08-23 010-08-23		Analyzo Preparo	•	AR AR
Da	17)		MDL		II_:4-			DT
Parameter Chloride	Flag		Result		Units			RL
Method Blank (1)	QC Batch: 72833		\2.10	·	mg/Kg			4
Method Diank (1)	QO Daten. 72000				•			
QC Batch: 72833		Date Analy		010-08-23		Analyze		AR
Prep Batch: 62442		QC Prepar	ation: 2	010-08-23		Prepare	d By:	AR
n.	Б.		MDL					
Parameter	Flag		Result		Units			RL
Chloride			<2.18		mg/Kg			4

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 10 of 16 Lea County, NM

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 62428

72812

Date Analyzed: QC Preparation:

2010-08-20 2010-08-20 Analyzed By: kg Prepared By: kg

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	241	mg/Kg	1	250	<14.5	96	57.4 - 133.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	234	mg/Kg	1	250	<14.5	94	57.4 - 133.4	3	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	110	108	mg/Kg	1	100	110	108	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:

72813 Prep Batch: 62423 Date Analyzed:

2010-08-22 QC Preparation: 2010-08-21

Analyzed By: AG Prepared By: AG

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.98	mg/Kg	1	2.00	< 0.0150	99	81.9 - 108
Toluene	1.87	mg/Kg	1	2.00	< 0.00950	94	81.9 - 107
Ethylbenzene	1.69	mg/Kg	1	2.00	< 0.0106	84	78.4 - 107
Xylene	5.09	mg/Kg	1	6.00	< 0.00930	85	79.1 - 107

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	2.06	mg/Kg	1	2.00	< 0.0150	103	81.9 - 108	4	20
Toluene	1.95	mg/Kg	1	2.00	< 0.00950	98	81.9 - 107	4	20
Ethylbenzene	1.81	mg/Kg	1	2.00	< 0.0106	90	78.4 - 107	7	20
Xylene	5.43	mg/Kg	1	6.00	< 0.00930	90	79.1 - 107	6	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.66	1.61	mg/Kg	1	2.00	83	80	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.49	1.43	mg/Kg	1	2.00	74	72	69.8 - 121

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 11 of 16 Lea County, NM

Laboratory Control Spike (LCS-1)

QC Batch:

72815

Date Analyzed:

2010-08-22

Analyzed By: AG

Prep Batch: 62423

QC Preparation: 2010-08-21

Prepared By: AG

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	14.3	mg/Kg	1	20.0 ·	<1.65	72	69.9 - 95.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	14.2	mg/Kg	1	20.0	< 1.65	71	69.9 - 95.4	1	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.05	1.86	mg/Kg	1	2.00	102	93	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.64	1.51	mg/Kg	1	2.00	82	76	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 62441

72832

Date Analyzed:

2010-08-23 QC Preparation: 2010-08-23 Analyzed By: AR Prepared By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.5	mg/Kg	1	100	< 2.18	98	85 - 115

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

	LCSD			\mathbf{Spike}	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	<2.18	102	85 - 115	4	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:

72833

Date Analyzed:

2010-08-23

Analyzed By: AR Prepared By: AR

Prep Batch: 62442

QC Preparation: 2010-08-23

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	96.2	mg/Kg	1	100	<2.18	96-	85 - 115

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

114-6400646

Work Order: 10081706 COG/GC Federal #13

Page Number: 12 of 16 Lea County, NM

	LCSD	** *.	7	Spike	Matrix	_	Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	<2.18	102	85 - 115	6	20

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

Matrix Spike (MS-1)

Spiked Sample: 241463

QC Batch:

Param

DRO

72812

Date Analyzed:

2010-08-20

Analyzed By: kg

Prep Batch: 62428

QC Preparation:

2010-08-20

Prepared By: kg

MŞ			Spike	Matrix		Rec.
Result	Units	Dil.	Amount	Result	Rec.	Limit
216	mg/Kg	1	250	<14.5	86	35.2 - 167.1

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	. Result	Rec.	Limit	RPD	\mathbf{Limit}
DRO	226	mg/Kg	1	250	<14.5	90	35.2 - 167.1	4	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	98.4	104	mg/Kg	1	100	98	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 241471

QC Batch:

72813

Date Analyzed:

2010-08-22

Analyzed By: AG Prepared By: AG

Prep Batch: 62423

QC Preparation: 2010-08-21

MSSpike Matrix Rec. Param Result Units Dil. Amount Result Limit Rec. 2.38 mg/Kg 2.00 80.5 - 112 Benzene 1 < 0.0150 119 3 2.32 Toluene mg/Kg 1 2.00 < 0.00950 116 82.4 - 113 2.27 mg/Kg 2.00 83.9 - 114 Ethylbenzene 1 < 0.0106 114 6.80 1 mg/Kg 6.00< 0.00930 84 - 114 113 Xylene

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

Param	$rac{ ext{MSD}}{ ext{Result}}$	Units	Dil.	$egin{array}{c} { m Spike} \ { m Amount} \end{array}$	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	2.16	mg/Kg	1	2.00	< 0.0150	108	80.5 - 112	10	20
Toluene	2.13	mg/Kg	1	2.00	< 0.00950	106	82.4 - 113	8	20
Ethylbenzene	2.10	mg/Kg	1	2.00	< 0.0106	105	83.9 - 114	8	20

continued ...

²Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

³Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

114-6400646

Work Order: 10081706 COG/GC Federal #13

Page Number: 13 of 16 Lea County, NM

matrix spikes continued ...

	MSD			Spike	Matrix		${ m Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Xylene	6.31	mg/Kg	1	6.00	< 0.00930	105	84 - 114	8	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.68	1.43	mg/Kg	1	2	84	72	41.3 - 117
4-Bromofluorobenzene (4-BFB)	1.57	1.28	mg/Kg	1	2	78	64	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 241593

QC Batch: 72815 Date Analyzed:

2010-08-22

Analyzed By: AG

Prep Batch: 62423

QC Preparation: 2010-08-21

Prepared By: AG

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	16.6	mg/Kg	1	20.0	<1.65	83	61.8 - 114

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	16.4	mg/Kg	1	20.0	<1.65	82	61.8 - 114	1	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.70	2.03	mg/Kg	1	2	85	102	50 - 162
4-Bromofluorobenzene (4-BFB)	1.54	1.80	mg/Kg	1	2	77	90	50 - 162

Matrix Spike (MS-1) Spiked Sample: 241463

QC Batch:

Date Analyzed:

2010-08-23

Analyzed By: AR Prepared By: AR

Prep Batch: 62441

QC Preparation: 2010-08-23

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	Lìmit
Chloride	11400	ıng/Kg	100	10000	1440	100	85 - 115

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

	MSD			$_{ m Spike}$	Matrix		${ m Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	12100	mg/Kg	100	10000	1440	107	85 - 115	6	20

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

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 14 of 16

Lea County, NM

Matrix Spike (MS-1)

Spiked Sample: 241476

QC Batch:

72833

Date Analyzed:

2010-08-23

Analyzed By: AR

Prep Batch: 62442

QC Preparation: 2010-08-23

Prepared By: AR

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	10600	mg/Kg	100	10000	459	101	85 - 115

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

	,	MSD			Spike	Matrix		Rec.		RPD
Param		Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		11000	mg/Kg	100	10000	459	105	85 - 115	4	20

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

Standard (CCV-1)

QC Batch: 72812

Date Analyzed: 2010-08-20

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	•
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Сопс.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	223	89	80 - 120	2010-08-20

Standard (CCV-2)

QC Batch: 72812

Date Analyzed: 2010-08-20

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	230	92	80 - 120	2010-08-20

Standard (CCV-1)

QC Batch: 72813

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs	$_{ m CCVs}$	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.101	101	80 - 120	2010-08-22
Toluene		mg/Kg	0.100	0.0964	96	80 - 120	2010-08-22
Ethylbenzene		mg/Kg	0.100	0.0882	88	80 - 120	2010-08-22
Xylene		mg/Kg	0.300	0.266	89	80 - 120	2010-08-22

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 15 of 16 Lea County, NM

Standard (CCV-2)

QC Batch: 72813

Date Analyzed: 2010-08-22

Analyzed By: AG

			$rac{ ext{CCVs}}{ ext{True}}$	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.105	105	80 - 120	2010-08-22
Toluene		mg/Kg	0.100	0.0994	99	80 - 120	2010-08-22
Ethylbenzene		mg/Kg	0.100	0.0915	92	80 - 120	2010-08-22
Xylene		mg/Kg	0.300	0.274	91	80 - 120	2010-08-22

Standard (CCV-1)

QC Batch: 72815

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	0.892	89	80 - 120	2010-08-22

Standard (CCV-2)

QC Batch: 72815

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO	-	mg/Kg	1.00	0.860	86	80 - 120	2010-08-22

Standard (ICV-1)

QC Batch: 72832

Date Analyzed: 2010-08-23

Analyzed By: AR

			ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-08-23

Standard (CCV-1)

QC Batch: 72832

Date Analyzed: 2010-08-23

Analyzed By: AR

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 16 of 16

Lea County, NM

			CCVs True	CCVs Found	$\begin{array}{c} { m CCVs} \\ { m Percent} \end{array}$	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.3	99	85 - 115	2010-08-23

Standard (ICV-1)

QC Batch: 72833

Date Analyzed: 2010-08-23

Analyzed By: AR

D-	T31	T	ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.4	99	85 - 115	2010-08-23

Standard (CCV-1)

QC Batch: 72833

Date Analyzed: 2010-08-23

Analyzed By: AR

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-08-23

RUSH Charges Authorizad: Yes Results by: AIRBILL 6: Major Aniona/Cations, pH, TDS Ë Please fill out all copies . Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy. (sotsedaA) MJ9 (Circle or Specify Method No.) (hiA) staß anglA ANALYSIS REQUEST Pest, 808/808 7/26 PCB's 8060/608 GC'M2 26MI' AN' 8310/625 HAND DELINERED JUPS SAMPLE SHIPPED BY: (CIrcle SAMPLED BY: (Print & Initial) Grain 2 3C'W2 API 8540\8560\654 Semilibiov knez 410T 岩石 Metala Ag As Ba Cd Vr Pd Hg Se RCRA Metata Ag As Be Cd Cr Pb Hg Se OTS8 HA9 BOOTET COOM BYON (EXT to C32) 81208 X3118 9 PRESERVATIVE METHOD Date: 5/16/10 NONE Analysis Request of Chain of Custody Record desper horizons CE CONH HCF FILTERED (Y/N) ĦR. NUMBER OF CONTAINERS ž Ŧ. It total TPH excends how my 432) 682-4559 • Fax (432) 682-3946 RECEIVED BY: (Signature) SAMPLE IDENTIFICATION RECEIVED BY: (Signature) **FETRA TECH** Midland, Texas 79705 1910 N. Big Spring St. I've Taxuetz 8 Federal # 13 L. G. NM SITE MANAGER: Ords. #: 100817-06 , <:2-Z 3-3.5 2-2 -<u>-</u>1.5. 5:2-7 ^ آ ه ٦, o REMARKS: ン む Ä AH- 2 ~ でませ AH-7 PROJECT NAME: AH-I 1-48 AH-AH ĝ PROME 8ARE COMP XIHTAM Y STATE TIME SAMPLE CONDITION WHEN RECEIVED. RELINGUISHED BY: (Signature) RELINCUISHED BY: (Signature) RELINDUSHED BY: (Signature) DATE RECEIMING LABORATORY: 8/s 7+10 O+7-HI CLIENT NAME: CITY. ALIENA PROJECT NO.: 24/460 73 LAB I.D. NUMBER 462 41,3 460 465 Test 35 ا مار

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 1 of 3

Summary Report

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

Report Date: February 23, 2011

Work Order: 11021803

Project Location: Lea County, NM Project Name: COG/GC Federal #13

Project Number: 114-6400646

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
257816	AH-1 0-1'	soil	2011-02-16	00:00	2011-02-17
257817	AH-1 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257818	AH-1 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257819	AH-2 0-1'	soil	2011-02-16	00:00	2011-02-17
257820	AH-2 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257821	AH-2 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257822	AH-3 0-1'	soil	2011-02-16	00:00	2011-02-17
257823	AH-3 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257824	AH-3 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257825	AH-4 0-1'	soil	2011-02-16	00:00	2011-02-17
257826	AH-4 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257827	AH-4 2-2.5'	soil	2011-02-16	00:00	2011-02-17

	BTEX				TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
257816 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	< 2.00
257819 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00
257822 - AH-3 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	82.7	< 2.00
257825 - AH-4 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00

Sample: 257816 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		997	mg/Kg	4.00

Sample: 257817 - AH-1 1-1.5'

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: February 23, 2011		Work Order: 11021803	Page Number: 2 of 3	
Param	Flag	Result	Units	RL
Chloride .		<200	mg/Kg	4.00
Sample: 257818	- AH-1 2-2.5'		•	
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00
Sample: 257819	- AH-2 0-1'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00
Sample: 257820	- AH-2 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00
Sample: 257821	- AH-2 2-2.5'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00
Sample: 257822	- AH-3 0-1'			
Param		Result	Units	RL
Chloride	Flag	2160	mg/Kg	4.00
Sample: 257823	- AH-3 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00
Sample: 257824	_ AH 2395;			
_		Danish	Units	DT
Param Chloride	Flag	Result <200	mg/Kg	RL 4.00
			<u> </u>	

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 3 of 3 Sample: 257825 - AH-4 0-1' Result Param Flag Units RLmg/Kg Chloride <200 4.00 Sample: 257826 - AH-4 1-1.5' Flag Param Result Units RLChloride <200 mg/Kg 4.00 Sample: 257827 - AH-4 2-2.5' Param Flag Result RLUnits

233

mg/Kg

4.00

Chloride



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 6015 Harris Parkway, Suite 110

Lubnock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703

800 • 378 • 1296 888 • 588 • 3443

915 • 585 • 3443 432 • 689 • 6301 817 • 201 • 5260

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944 FAX 432 • 689 • 6313

Ft. Worth, Texas 76132 E-Mail: lah@traceanalysis.com

Certifications

WBENC: 237019 HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

LELAP-02003

Kansas E-10317

T104704221-08-TX El Paso:

LELAP-02002

Midland: T104704392-08-TX

Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street

Report Date: February 23, 2011

Midland, TX, 79705

Work Order: 11021803

Project Name:

Project Location: Lea County, NM COG/GC Federal #13

Project Number: 114-6400646

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
257816	AH-1 0-1'	soil	2011-02-16	00:00	2011-02-17
257817	AH-1 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257818	AH-1 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257819	AH-2 0-1'	soil	2011-02-16	00:00	2011-02-17
257820	AH-2 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257821	AH-2 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257822	AH-3 0-1'	soil	2011-02-16	00:00	2011-02-17
257823	AH-3 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257824	AH-3 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257825	AH-4 0-1'	soil	2011-02-16	00:00	2011-02-17

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
257826	AH-4 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257827	AH-4 2-2.5'	soil	2011-02-16	00:00	2011-02-17

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 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

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

Standard Flags

 ${\bf B}$ - The sample contains less than ten times the concentration found in the method blank.

Samples for project COG/GC Federal #13 were received by TraceAnalysis, Inc. on 2011-02-17 and assigned to work order 11021803. Samples for work order 11021803 were received intact at a temperature of 7.2 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	66705	2011-02-21 at 12:05	77804	2011-02-21 at 12:05
Chloride (Titration)	SM 4500-Cl B	66703	2011-02-21 at 10:36	77796	2011-02-21 at 13:20
Chloride (Titration)	SM 4500-Cl B	66703	2011-02-21 at 10:36	77797	2011-02-21 at 13:20
TPH DRO - NEW	S 8015 D	66718	2011-02-21 at 09:51	77781	2011-02-21 at 09:51
TPH GRO	S 8015 D	66705	2011-02-21 at 12:05	77805	2011-02-21 at 12:05

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 11021803 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.

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 4 of 20 Lea County, NM

Analytical Report

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX 77804 QC Batch: Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed:

2011-02-21 Sample Preparation: 2011-02-21 Prep Method: S 5035 Analyzed By:

MEPrepared By: ME

RΤ

		n.L			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Triffuorotoluene (TFT)	_	2.62	mg/Kg	1	2.00	131	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		3.06	mg/Kg	1	2.00	.153	35.7 - 159. <u>6</u>

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Chloride (Titration) Analysis: QC Batch: 77796 Prep Batch: 66703

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2011-02-21 2011-02-21

Prep Method: N/A Analyzed By: AR Prepared By: AR

RL

Parameter	Flag_	Result	Units	Dilution	RL_
Chloride	_	997	mg/Kg	100	4.00

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

TPH DRO - NEW Analysis: QC Batch: 77781 Prep Batch: 66718

Analytical Method: S 8015 D Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: kg Prepared By: kg

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO		< 50.0	mg/Kg	1	50.0

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 5 of 20 Lea County, NM

	ÇUG/	GC rederan	#13
 			

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	1105	87.2	mg/Kg	1	100	87	70 - 130

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH GRO QC Batch: 77805 Prep Batch: 66705 Analytical Method: S 8015 D
Date Analyzed: 2011-02-21
Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: ME Prepared By: ME

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.70	mg/Kg	1	2.00	135	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.81	mg/Kg	1	2.00	140	22.2 - 160.2

Sample: 257817 - AH-1 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Sample: 257818 - AH-1 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 6 of 20 Lea County, NM

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 77804 Prep Batch: 66705 Analytical Method: S 8021B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21 Prep Method: S 5035 Analyzed By: ME Prepared By: ME

RLParameter Flag Result Units Dilution RLBenzene < 0.0200 mg/Kg 0.0200 Toluene < 0.0200 mg/Kg 1 0.0200 Ethylbenzene 1 0.0200 < 0.0200 mg/Kg 1 Xylene < 0.0200 mg/Kg 0.0200

Spike Percent Recovery Surrogate Flag Result Units Dilution Amount Recovery Limits Trifluorotoluene (TFT) 2.542.00 51.6 - 149.2 mg/Kg 1 1274-Bromofluorobenzene (4-BFB) 2.94 1 2.00 147 35.7 - 159.6 mg/Kg

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21

Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21 Prep Method: N/A Analyzed By: AR

Analyzed By: AR Prepared By: AR

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW QC Batch: 77781
Prep Batch: 66718

Analytical Method: S 8015 D
Date Analyzed: 2011-02-21
Sample Preparation: 2011-02-21

Prep Method: N/A
Analyzed By: kg
Prepared By: kg

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		78.7	mg/Kg	1	100	79	70 - 130

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 7 of 20 Lea County, NM

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

TPH GRO Analysis: QC Batch: 77805 Prep Batch: 66705

Analytical Method: Date Analyzed:

S 8015 D 2011-02-21 Sample Preparation: 2011-02-21 Prep Method: S 5035 Analyzed By: MEPrepared By: ME

RT.

Parameter	Flag	Result	Units	Dilution	RL
GRO		< 2.00	mg/Kg	1	2.00

					$\mathbf{S}_{\mathbf{P}i\mathbf{k}\mathbf{e}}$	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.55	mg/Kg	1	2.00	128	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.69	mg/Kg	1	2.00	134	22.2 - 160.2

Sample: 257820 - AH-2 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-02-21 2011-02-21

Prep Method: N/A Analyzed By: AR Prepared By: AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample Preparation:

Sample: 257821 - AH-2 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B Prep Method: N/A 2011-02-21 Analyzed By: ARPrepared By: 2011-02-21 AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample: 257822 - AH-3 0-1'

Laboratory: Midland

BTEX Analysis: QC Batch: 77804 Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 8 of 20 Lea County, NM

		RL			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.28	mg/Kg	1	2.00	114	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		2.66	mg/Kg	1	2.00	133	35.7 - 159.6

Sample: 257822 - AH-3 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A

Analyzed By: ARPrepared By: AR

RLResult Units Dilution RLParameter Flag 2160 100 Chloride mg/Kg 4.00

Sample: 257822 - AH-3 0-1'

Laboratory: Midland

TPH DRO - NEW Analysis:

QC Batch: 77781 Prep Batch: 66718 Analytical Method: Date Analyzed:

S 8015 D 2011-02-21 Sample Preparation: 2011-02-21 Prep Method: N/A Analyzed By: kg Prepared By: kg

RLParameter Flag Result Units Dilution RLDRO 82.7mg/Kg 50.0

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		124	mg/Kg	1	100	124	70 - 130

Sample: 257822 - AH-3 0-1'

Laboratory: Midland

TPH GRO Analysis: QC Batch: 77805 Prep Batch: 66705

Analytical Method: S 8015 D Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 9 of 20 Lea County, NM

Parameter F	ag	RL Result		Units		Dilution	RL
GRO		< 2.00		mg/Kg		1	2.00
0			**	5 0.0	Spike	Percent	Recovery
Surrogate	Flag	Result	${ m Units}$	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.34	mg/Kg	1	2.00	117	36.3 - 158.9
4-Bromofluorobenzene (4-BF	'B)	2.48	mg/Kg	1	2.00	124	22.2 - 160.2

Sample: 257823 - AH-3 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

N/A Prep Method: AR

Analyzed By: Prepared By: AR

		m RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample: 257824 - AH-3 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 77796

Prep Batch: 66703

Analytical Method: SM 4500-Cl B 2011-02-21 Date Analyzed: Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: ARPrepared By: AR

RLParameter Units Dilution RLFlag Result Chloride <200 mg/Kg $\overline{50}$ 4.00

Sample: 257825 - AH-4 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 77804 Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

RLFlag Units Dilution RLParameter Result Benzene mg/Kg 0.0200 < 0.0200 ī 0.0200Toluene < 0.0200 mg/Kg 1 Ethylbenzene < 0.0200 mg/Kg 1 0.02001 Xylene < 0.0200 mg/Kg 0.0200

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 10 of 20

Lea County, NM

				•	Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.45	mg/Kg	1	2.00	122	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		2.78	mg/Kg	1	2.00	139	35.7 - 159.6

Sample: 257825 - AH-4 0-1'

Laboratory:

Midland

Chloride (Titration) Analysis:

QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B

Date Analyzed:

2011-02-21

Prep Method: N/A

Sample Preparation: 2011-02-21

Analyzed By: ARPrepared By: AR

RL

Result Units Dilution RLParameter Flag <200 Chloride mg/Kg 50 4.00

Sample: 257825 - AH-4 0-1'

Laboratory:

Midland

TPH DRO - NEW Analysis: QC Batch: 77781

Analytical Method:

S 8015 D 2011-02-21 Prep Method: N/A Analyzed By: kg

Prep Batch: 66718

Date Analyzed: Sample Preparation:

2011-02-21

Prepared By: kg

RL

Parameter Flag Result Units Dilution RL< 50.0 mg/Kg 50.0 $\overline{\text{DRO}}$

					Spike	$\operatorname{Percent}$	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		87.4	mg/Kg	1	100	87	70 - 130

Sample: 257825 - AH-4 0-1'

Laboratory:

Midland

TPH GRO Analysis: QC Batch: 77805 Prep Batch: 66705

Analytical Method: Date Analyzed:

S 8015 D

2011-02-21 Sample Preparation: 2011-02-21 Prep Method: Analyzed By:

S 5035 MEPrepared By: ME

RL

Flag Result Units . Dilution RLParameter 2.00 GRO < 2.00 mg/Kg

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 11 of 20 Lea County, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.50	mg/Kg	1	2.00	125	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.56	mg/Kg	1	2.00	128	22.2 - 160.2

Sample: 257826 - AH-4 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77797 Prep Batch: 66703 Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: AR Prepared By: AR

RLParameter Flag Result Units Dilution RLChloride <200 mg/Kg 50 4.00

Sample: 257827 - AH-4 2-2.5'

Laboratory: Midland

Analysis:

QC Batch: 77797

Chloride (Titration)

Prep Batch: 66703

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2011-02-21 2011-02-21

Prep Method: N/A Analyzed By: AR. Prepared By: AR

· RL Parameter Dilution RLFlag Result Units Chloride 233 50 4.00mg/Kg

Method Blank (1) QC Batch: 77781

QC Batch: 77781 Prep Batch: 66718 Date Analyzed: 2011-02-21 2011-02-21 QC Preparation:

Analyzed By: kg Prepared By:

MDL Result Units RLParameter Flag mg/Kg $\overline{\text{DRO}}$ < 15.750

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		74.8	mg/Kg	1	100	75	70 - 130

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 12 of 20 114-6400646 COG/GC Federal #13 Lea County, NM Method Blank (1) QC Batch: 77796 QC Batch: 77796 Date Analyzed: 2011-02-21 Analyzed By: AR Prep Batch: 66703 QC Preparation: 2011-02-21 Prepared By: AR MDL Parameter Units Flag Result RLChloride < 2.18 mg/Kg 4 Method Blank (1) QC Batch: 77797 QC Batch: 77797 Date Analyzed: 2011-02-21 Analyzed By: ARPrep Batch: 66703 QC Preparation: 2011-02-21 Prepared By: ARMDL Parameter Flag Units Result RLChloride <2.18 mg/Kg Method Blank (1) QC Batch: 77804 Date Analyzed: QC Batch: 77804 2011-02-21 Analyzed By: MEPrep Batch: 66705 QC Preparation: 2011-02-21 Prepared By: ME MDL Parameter Result Units RLFlag < 0.0118 mg/Kg Benzene 0.02Toluene < 0.00600 mg/Kg 0.02Ethylbenzene 0.02 < 0.00850 mg/Kg Xylene < 0.00613 mg/Kg 0.02Spike Percent Recovery Surrogate Flag Result Units Dilution Amount Recovery Limits Trifluorotoluene (TFT) 2.41 mg/Kg $\overline{1}$ 2.00 · 120 70.8 - 123.5 2.00 128 4-Bromofluorobenzene (4-BFB) 2.56 1 48.8 - 134 mg/Kg

 Prep Batch:
 66705
 QC Preparation:
 2011-02-21
 Prepared By:
 ME

 MDL
 MDL
 Inits
 RE

 Parameter
 Flag
 Result
 Units
 RL

 GRO
 <0.753</td>
 mg/Kg
 2

2011-02-21

Analyzed By:

ME

Date Analyzed:

Method Blank (1)

77805

QC Batch:

QC Batch: 77805

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 13 of 20 Lea County, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.38	mg/Kg	1	2.00	119	74.6 - 127.8
4-Bromofluorobenzene (4-BFB)		2.50	mg/Kg	1	2.00	125	32.9 - 129.8

Laboratory Control Spike (LCS-1)

QC Batch: 77781 Date Analyzed: 2011-02-21 . Analyzed By: kg

Prep Batch: 66718

QC Preparation: 2011-02-21

Prepared By: kg

	LCS			\mathbf{Spike}	Matrix		${f Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}
DRO	206	mg/Kg	1	250	<15.7	82	47.5 - 144.1

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	210	mg/Kg	1	250	<15.7	84	47.5 - 144.1	2	20

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

	LCS	LCSD			Spike	LCS	LCSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	$\mathbf{Rec}.$	Rec .	Limit
n-Tricosane	99.2	99.7	mg/Kg	1	100	99	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 66703

77796

Date Analyzed:

2011-02-21 QC Preparation: 2011-02-21 Analyzed By: AR Prepared By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	$\mathbf{Rec.}$	Limit
Chloride	94.9	mg/Kg	1	100	< 2.18	95	85 - 115

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil .	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	104	mg/Kg	1	100	< 2.18	104	85 - 115	9	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: Prep Batch: 66703 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: AR Prepared By: AR

114 - 6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 14 of 20 Lea County, NM

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.5	mg/Kg	1	100	<2.18	98	85 - 115

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

•	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	\mathbf{Limit}
Chloride	103	mg/Kg	1	100	<2.18	103	85 - 115	6	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: 77804 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	LCS			\mathbf{Spike}	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	${ m Rec.}$	Limit
Benzene	1.86	mg/Kg	1	2.00	< 0.0118	93	76.4 - 118.4
Toluene	1.92	mg/Kg	1	2.00	< 0.00600	96	81.8 - 111.9
Ethylbenzene	1.94	mg/Kg	1	2.00	< 0.00850	97	81.1 - 112.2
Xylene	5.92	mg/Kg	1	6.00	< 0.00613	99	81.7 - 111.5

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	${ m Rec.}$	Limit	RPD	Limit
Benzene	1.88	mg/Kg	1	2.00	< 0.0118	94	76.4 - 118.4	1	20
Toluene	1.93	mg/Kg	1	2.00	< 0.00600	96	81.8 - 111.9	0	20
Ethylbenzene	1.98	mg/Kg	1	2.00	< 0.00850	99	81.1 - 112.2	2	20
Xylene	5.96	mg/Kg	1	6.00	< 0.00613	99	81.7 - 111.5	1	20

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

Summa mada	LCS	LCSD	TILLIA	Dil	Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec .	Rec.	${f Limit}$
Trifluorotoluene (TFT)	2.05	2.03	mg/Kg	1	2.00	102	102	69 - 123.3
4-Bromofluorobenzene (4-BFB)	2.42	2.41	mg/Kg	1	2.00	121	120	64.9 - 131.9

Laboratory Control Spike (LCS-1)

QC Batch: 77805 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	LCS			Spike	Matrix		Rec.
Param	Result	\mathbf{Units}	Dil.	Amount	Result	Rec.	Limit
GRO	17.1	mg/Kg	1	20.0	< 0.753	86	61.8 - 97

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 15 of 20 Lea County, NM

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	17.0	mg/Kg	1	20.0	< 0.753	85	61.8 - 97	1	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	2.13	2.07	mg/Kg	1	2.00	106	104	74.6 - 124
4-Bromofluorobenzene (4-BFB)	2.29	2.22	mg/Kg	1	2.00	114	111	53.9 - 121.1

Matrix Spike (MS-1)

Spiked Sample: 258012

QC Batch: 77781 Prep Batch: 66718 Date Analyzed: 2011-02-21

QC Preparation: 2011-02-21

Analyzed By: kg Prepared By: kg

	MS			\mathbf{Spike}	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	595	mg/Kg	1	250	334	104	11.7 - 152.3

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	709	mg/Kg	1	250	334	150	11.7 - 152.3	18	20

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

		MS	MSD			Spike	MS	MSD	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	1 2	142	161	mg/Kg	1	100	142	161	70 - 130

Matrix Spike (MS-1) Spiked Sample: 257825

QC Batch: 77796 Prep Batch: 66703 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: AR Prepared By: AR

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	$_{ m Units}$	Dil.	Amount	Result	${ m Rec.}$	Limit
Chloride	10100	mg/Kg	100	10000	<218	99	85 - 115

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

¹ High surrogate recovery due to peak interference.

²High surrogate recovery due to peak interference.

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 16 of 20

Lea County, NM

Param	MSD Result	Units	Dil.	Spike	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
iaiaiii	resure	Onto	1711.	Amount	rtesurt	rucu.	Lilling	IU D	Limit
Chloride	10500	mg/Kg	100	10000	<218	103	85 - 115	4	20

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

Matrix Spike (MS-1)

Spiked Sample: 257845

QC Batch: 77797 Prep Batch: 66703 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: AR Prepared By: AR

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	11600	mg/Kg	100	10000	1350	102	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{Result}	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	12000	mg/Kg	100	10000	1350	106	85 - 115	3	20

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

Matrix Spike (MS-1)

Spiked Sample: 257853

QC Batch: 77804 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene	1.93	mg/Kg	1	2.00	< 0.0118	96	65.5 - 139.8
Toluene	2.10	mg/Kg	1	2.00	0.2359	93	70.5 - 137.3
Ethylbenzene	2.33	mg/Kg	1	2.00	0.3461	99	66.7 - 151
Xylene	7.35	mg/Kg	1	6.00	1.2225	102	68.7 - 1 <u>49.5</u>

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

_	MSD	. .		Spike	Matrix	_	Rec .		RPD
Param	Result	Units	Dil.	Amount	\mathbf{Result}	Rec.	\mathbf{Limit}	RPD	Limit
Benzene	1.91	mg/Kg	1	2.00	< 0.0118	96	65.5 - 139.8	1	20
Toluene	2.10	mg/Kg	1	2.00	0.2359	93	70.5 - 137.3	0	20
Ethylbenzene	2.44	mg/Kg	1	2.00	0.3461	105	66.7 - 151	5	20
Xylene	7.52	mg/Kg	1	6.00	1.2225	105	68.7 - 149.5	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	${ m Rec.}$	Limit
Trifluorotoluene (TFT)	2.55	2.54	mg/Kg	1	2	128	127	50.9 - 152.9

continued ...

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 17 of 20 Lea County, NM

matrix spikes continued ...

		MS	MSD			Бріке	WIS	พรษ	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
4-Bromofluorobenzene (4-BFB)	3 4	3.49	3.51	mg/Kg	1	2	174	176	48.5 - 165.8

Matrix Spike (MS-1)

Spiked Sample: 257849

QC Batch: 77805 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

MS Spike Matrix Rec. Result Limit Param Result Units Dil. Amount Rec. GRO 16.1 mg/Kg 20.0 < 0.753 80 63 - 108.5

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

	MSD			$_{ m Spike}$	Matrix		${ m Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	17.6	mg/Kg	1	20.0	< 0.753	88	63 - 108.5	9	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.63	2.69	mg/Kg	1	2	132	134	54.1 - 154.3
4-Bromofluorobenzene (4-BFB)	2.87	2.93	mg/Kg	1	2	144	146	41.9 - 162.8

Standard (CCV-1)

QC Batch: 77781

Date Analyzed: 2011-02-21

Analyzed By: kg

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	208	83	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77781

Date Analyzed: 2011-02-21

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	•
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	225	90	80 - 120	2011-02-21

 $^{^3\}mathrm{High}$ surrogate recovery due to peak interference.

⁴ High surrogate recovery due to peak interference.

Report Date: February 23, 2011 114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 18 of 20 Lea County, NM

Standard (ICV-1)

QC Batch: 77796

Date Analyzed: 2011-02-21

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	103	103	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77796

Date Analyzed: 2011-02-21

Analyzed By: AR

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	97.4	97	85 - 115	2011-02-21

Standard (ICV-1)

QC Batch: 77797

Date Analyzed: 2011-02-21

Analyzed By: AR

			ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed_
Chloride		mg/Kg	100	99.1	99	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77797

Date Analyzed: 2011-02-21

Analyzed By: AR

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.103	103	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.106	106	80 - 120	2011-02-21

continued ...

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 19 of 20 Lea County, NM

standard continued ...

			CCVs	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Ethylbenzene		mg/Kg	0.100	0.104	104	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.317	106	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.0959	96	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.0984	98	80 - 120	2011-02-21
Ethylbenzene		mg/Kg	0.100	0.0988	99	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.300	100	80 - 120	2011-02-21

Standard (CCV-3)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.0943	94	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.0956	96	80 - 120	2011-02-21
Ethylbenzene		mg/Kg	0.100	0.0955	96	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.289	96	80 - 120	2011-02-21

Standard (CCV-1)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.10	110	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13

Page Number: 20 of 20

Lea County, NM

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.02	102	80 - 120	2011-02-21

Standard (CCV-3)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.07	107	80 - 120	2011-02-21

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		SITE INFORMAT	TON
	,	Report Type: Clo	osure
General Site In	formation:		建设的企业的企业的企业企业的企业企业
Site:		GC Federal #13 (Well Site)	
Company:		COG Operating LLC	
Section, Towns	ship and Range	Section 19, T17S, R32E, Unit N	
Lease Number	•	30-025-39109	
County:		Lea County	
GPS:		32.81443	103.80842
Surface Owner	<u>. </u>	Federal	
Mineral Owner	<u> </u>		
Directions:		(west) into lease road and go 2.5 mile	CR 126, go North on CR 126 for 1.8 miles, turn left es to Site.
Rele	ase Data:	Spill #1	Spill #2
	ase Data:	7/12/2010	12/23/2010
Date Released: Type Release:		7/12/2010 Produced Water	12/23/2010 Produced Water
Date Released: Type Release: Source of Conta		7/12/2010 Produced Water Flow line	12/23/2010 Produced Water Flow line
Date Released: Type Release: Source of Conta Fluid Released:	nmination:	7/12/2010 Produced Water Flow line 12 barrels	12/23/2010 Produced Water Flow line 23 barrels
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Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Commi	amination:	7/12/2010 Produced Water Flow line 12 barrels 10 barrels	12/23/2010 Produced Water Flow line 23 barrels 20 barrels
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Commi	nmination: ed: unication:	7/12/2010 Produced Water Flow line 12 barrels 10 barrels	12/23/2010 Produced Water Flow line 23 barrels 20 barrels
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Commi Name: Company:	amination: ed: unication:	7/12/2010 Produced Water Flow line 12 barrels 10 barrels	12/23/2010 Produced Water Flow line 23 barrels 20 barrels
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Common Name: Company:	ed: inication: Pat Ellis COG Operating, L	7/12/2010 Produced Water Flow line 12 barrels 10 barrels	12/23/2010 Produced Water Flow line 23 barrels 20 barrels lke Tavarez Tetra Tech
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Common Name: Company: Address: P.O. Box	ed: inication: Pat Ellis COG Operating, L	7/12/2010 Produced Water Flow line 12 barrels 10 barrels LC Ste. 1300	12/23/2010 Produced Water Flow line 23 barrels 20 barrels Ike Tavarez Tetra Tech
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere Official Common Name: Company: Address: P.O. Box City:	Pat Ellis COG Operating, L 550 W. Texas Ave	7/12/2010 Produced Water Flow line 12 barrels 10 barrels LC Ste. 1300	12/23/2010 Produced Water Flow line 23 barrels 20 barrels Ike Tavarez Tetra Tech 1910 N. Big Spring Midland, Texas
Date Released: Type Release: Source of Conta Fluid Released: Fluids Recovere	Pat Ellis COG Operating, L 550 W. Texas Ave	7/12/2010 Produced Water Flow line 12 barrels 10 barrels LC Ste. 1300	12/23/2010 Produced Water Flow line 23 barrels 20 barrels Ike Tavarez Tetra Tech 1910 N. Big Spring

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	0
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:	20 E	HOBBS OCD

- Accepta	ble Soil RRAL (r	ng/kg) 蘇桑
Benzene	Total BTEX	TPH
10	50	5,000

JUL 0 1 2011

RECEIVED



June 13, 2011

HOBBS OCD

Mr. Geoffrey Leking Environmental Engineer Specialist Oil Conservation Division, District 1 1625 North French Drive Hobbs, New Mexico 88240

JUL 01 2011

RECEIVED

Re: Closure Report for the COG Operating LLC., GC Federal #13 Well Site, Unit N, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico.

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the GC Federal #13 Well Site, Unit N, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.81443°, W 103.80842°. The site location is shown on Figures 1 and 2.

Background (2 Spills)

According to the State of New Mexico C-141 Initial Reports, the first leak was discovered on July 12, 2010 and released approximately twelve (12) barrels of produced water, due to a flow line rupture. Ten (10) barrels of standing fluids were recovered from the site. The spill was contained on the well pad location measuring approximately 15' x 50'. On December 23, 2010, the second leak occurred on the flow line releasing 23 barrels of produced water and 20 barrels of fluid were recovered. The fluid remained on the pad and measuring approximately 55' x 65', which encompassed the foot print of the first spill. The two initial C-141 forms are enclosed in Appendix C.

Groundwater

On July 14, 2009, Tetra Tech installed a temporary monitor well in Section 30 to establish a depth to water in the area. The well was installed to a total depth of 180' below surface. The well was gauged and found no groundwater in the well (dry). According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 100' below surface. The average depth to groundwater map and well log are shown in Appendix A.



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

Spill #1

On August 16, 2010, Tetra Tech personnel inspected and sampled the spill area. The spill area measured approximately 15' x 65'. Due to the limited impacted area, two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger to assess the impacted soils. Select 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 B. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the submitted samples at 0-1' were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the shallow soils (0-1') in both auger holes locations.

Spill #2

On December 23, 2010, Tetra Tech inspected and sampled the spill area. The second spill was larger and encompassed the first spill foot print. The spill area measured approximately 55' x 65'. A total of four (4) auger holes were installed to assess the spill area. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B. The sampling results are summarized in Table 2. The auger hole locations are shown on Figure 3.

Referring to Table 2, none of the samples at 0-1' exceeded the TPH and BTEX RRAL. Auger holes AH-1 and AH-3 showed chloride concentrations at 0-1' of 990 mg/kg and 2,160 mg/kg, respectively. The deeper samples were below the laboratory reporting limit. The remaining auger holes AH-2 and AH-4 did not show a chloride impact to the area.



Remedial Work and Closure Request

On April 1, 2011, Tetra Tech personnel oversaw the excavation of the site. The soil remediation was performed according to the approved work plan. The excavation area measured approximately 60' x 30' wide, and included an additional area to the east measuring approximately 20' x 30'. The excavation areas and final depths are shown on Figure 4.

The excavated areas were backfilled with clean material and brought up to surface grade. Approximately 500 yards³ were removed and hauled to CRI Inc. for proper disposal.

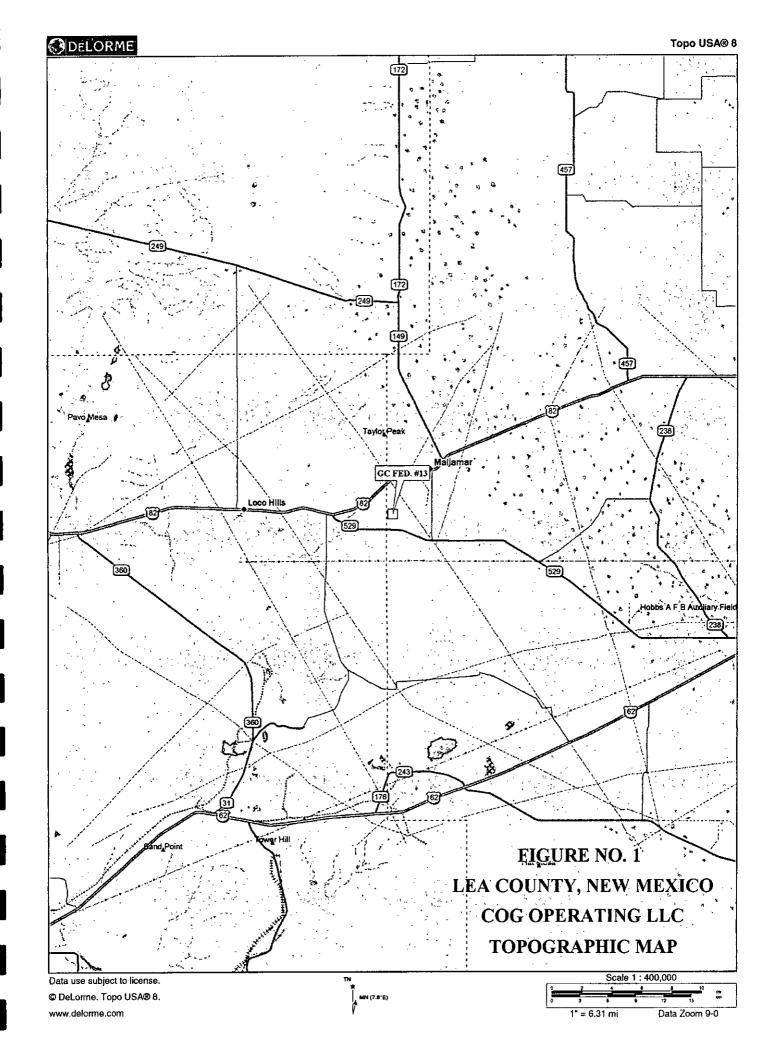
Based on the remedial activities performed at this site, COG request closure of this site. A copies of the C-141 (Final) are included in Appendix C. If you require any additional information or have any questions or comments concerning this report, please call at (432) 682-4559.

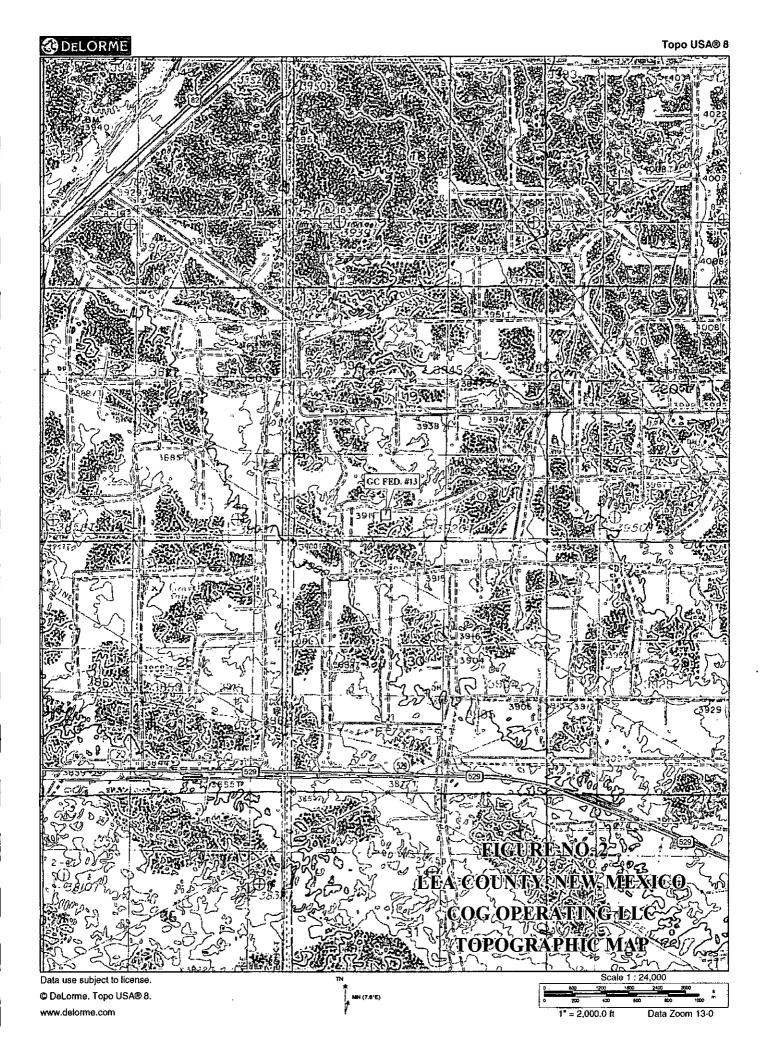
Respectfully submitted,

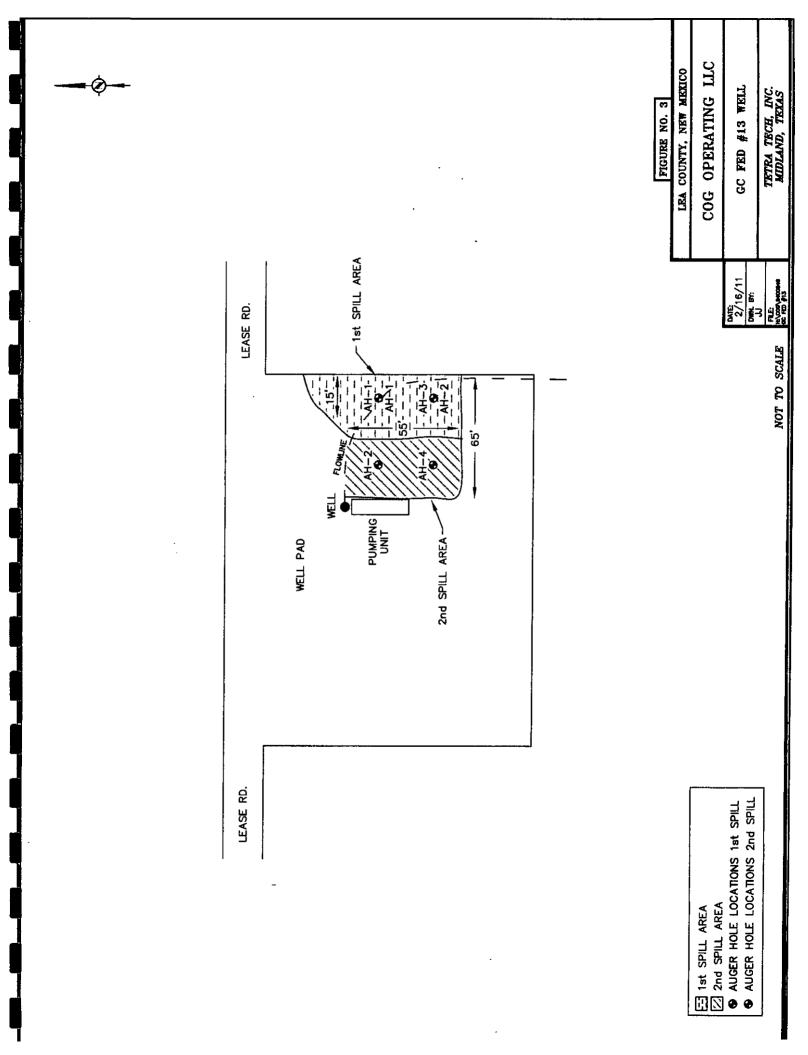
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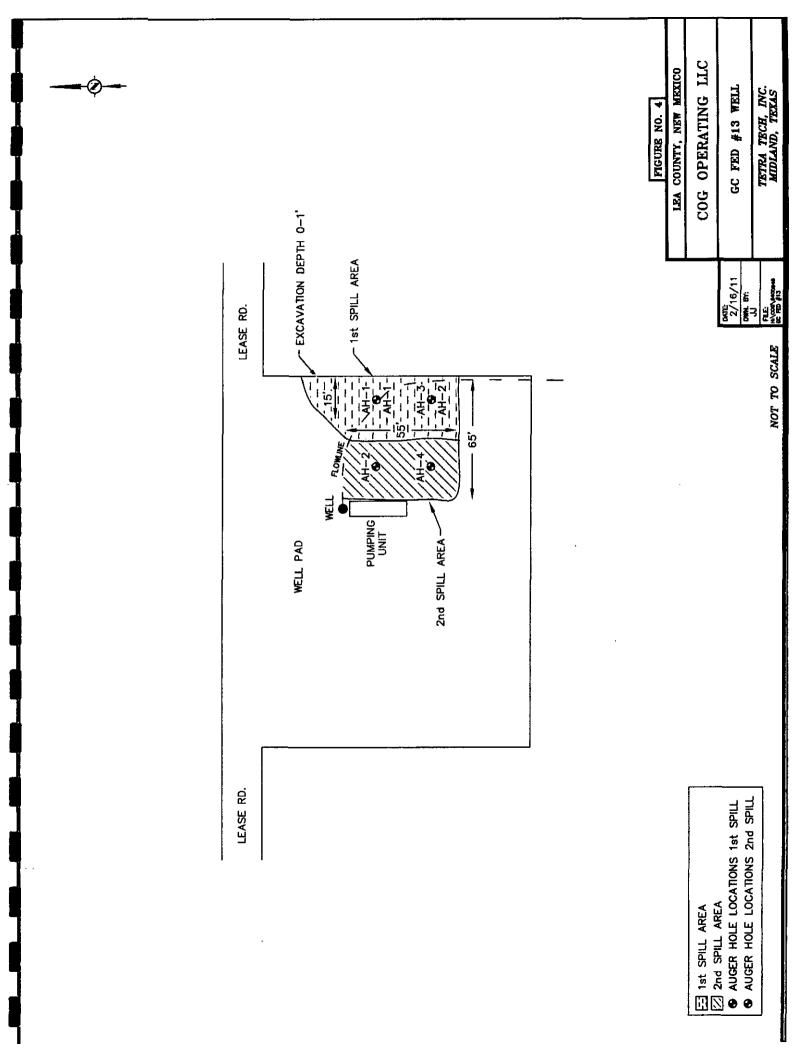
Kim Dorey Staff II Geologist

cc: Pat Ellis – COG cc: Jim Amos – BLM cc: Terry Gregston



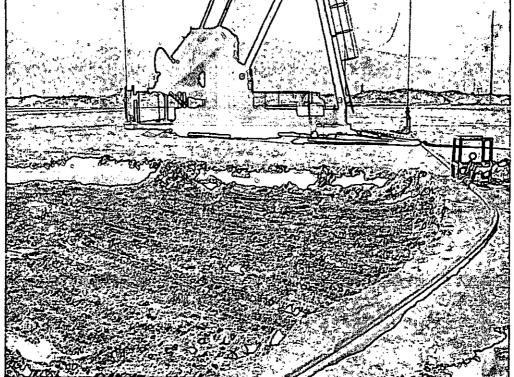




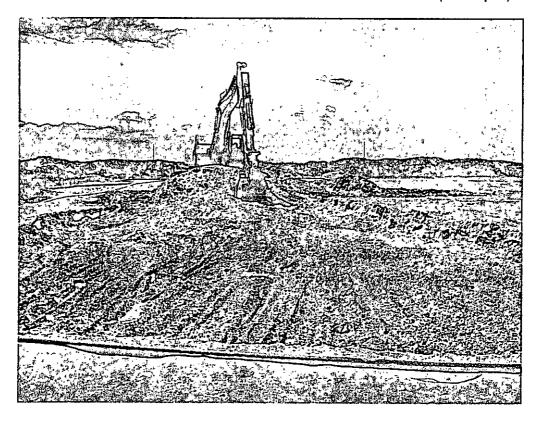


COG Operating LLC GC Federal #13 Well



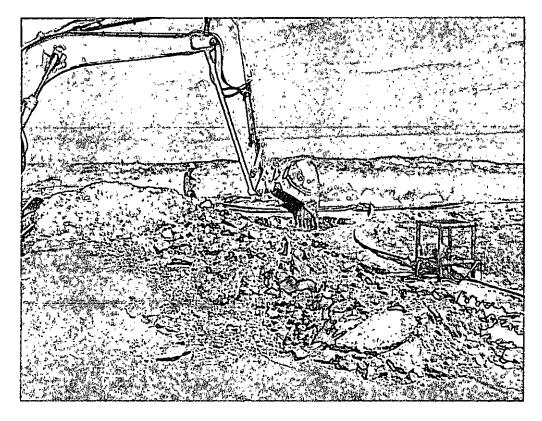


View west – Excavated area near AH-4 and AH-2 (2nd Spill)

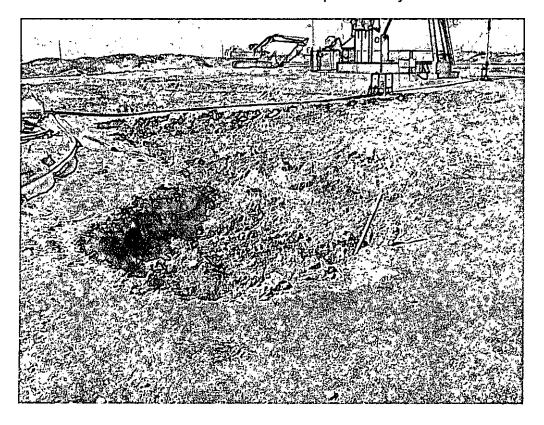


Completed excavation of spill footprint

COG Operating LLC GC Federal #13 Well Lea County, New Mexico



Excavation additional area as requested by Jim Amos



Completed excavation of additional area

COG Operating LLC. GC FEDERAL #13 (1st Spill) LEA COUNTY, NEW MEXICO Table 1

Sample	Sample	Sample	Depth	Soil 8	Status	TF	TPH (mg/kg)	(1	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
Ω	Date		(BEB)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)
AH-1	8/16/2010	,1-0			×	<2.00	<50.0	<50.0	<50.0 <0.0200	<0.0200	<0.0200	<0.0200	3,920
	н	1-1.5		×		,		•		•	-	ŧ	573
		2-2.5		×		,	•	•	•	•	•	-	<200
AH-2	AH-2 8/16/2010	0-1,			×	<2.00	<50.0	<50.0	<2.00 <50.0 <50.0 <50.0 <0.0200	<0.0200	<0.0200	<0.0200	1,440
	п	1-1.5		×		ī	ı	•	•	•	-	-	433
	п	2-2.5'		×		•	-		-	•	-	•	594
	и	3-3.5		X		1	,	•	•	•	•	•	<200
		4-4.5		×		•	-	-	•	•	•	•	<200

Below Excavation Bottom Not Analyzed Excavation Depths

G. BEB

COG Operating LLC.
GC FEDERAL #13 (2nd Spill)
LEA COUNTY, NEW MEXICO Table 2

AH-1 2/16/2011 0-1¹ AH-2 1-1.5¹ X A-2.00 ABOOK AH-2 2/16/2011 0-1¹ X X ABOOK ABOOK AH-2 2/16/2011 0-1¹ X X ABOOK ABOOK AH-3 2/16/2011 0-1¹ X ABOOK ABOOK ABOOK ABOOK AH-3 1 1-1.5² X ABOOK ABOOK ABOOK ABOOK ABOOK ABOOK	Salliple Dist	Salin Die	Depth	Soil (il Status	⊨	TPH (mg/kg)	9)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
2/16/2011 0-1' * X < 2.00 " 2-2.5' X < 2.00 2/16/2011 0-1' X < 2.00 " 1-1.5' X < 2.00 " 2-2.5' X < 2.00 2/16/2011 0-1' X < 2.00 " 1-1.5' X < 2.00 " 1-1.5' X < 2.00 " 2-2.5' X < 2.00 " 2-2.5' X < 2.00 " 2-2.5' X < 2.00	оашріе				Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
" 1-1.5' X C.0.0 2/16/2011 0-1' X <2.00	-					<2.00		<50.0	<0.0200	<0.0200	<0.020.0>	÷0.0200	365
" 2-2.5' X <2.00	=	1-1.5	,	×									<200
2/16/2011 0-1' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X <2.00 " 2-2.5' X <2.00	2	2-2.5'		×									<200
2/16/2011 0-1' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X <2.00 " 2-2.5' X													
1-1.5'		_		×		<2.00	<50.0	0.05>	<0.0200	<0.0200	<0.0200	<0.0200	<200
2/16/2011 0-1' X <2.00 1 1-1.5' X <2.00 " 2-2.5' X	=	1-1.5'		×									<200
2/16/2011 0-1' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X	=	2-2.5'		×									<200
2/16/2011 0-1' X <2.00 " 1-1.5' X <2.00 " 2-2.5' X													
1-1.5'	-	_	,		×	<2.00	<50.0	0'05>	<0.0200	<0.0200	<0.0200	<0.0200	2,160
2-2.5'	=	1-1.5		×									<200
	=	2-2.5		×									<200
AH-4 2/16/2011 0-1' X <2.00 <50.0				×		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<200
" 1-1.5' X	=	1-1.5'		×									<200
" 2-2.5' X	=	2-2.5'		×									233

Below Excavation Bottom

Not Analyzed **I**

Excavation Depths

Water Well Data Average Depth to Groundwater (ft) COG - GC Federal #13 Lea County, New Mexico

	16	South	3	1 East			16 9	South	3	2 East			16 S	outh	33	East	
3	5	4	3	2	1	6	5	4	3	2	1	6	5 180	4	3 130	2	1
			1			1		}	65	265	265	1	1	150		148	142
_	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	ŀ		1		288	- 1		1			215	ł	200	1	182	ļ .	142
3	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
		İ	1	Į	113			221			215	- 1	182	180	175	143	110
9	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
						220		210	1	210						120	
0	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
	-				ļ l		I .	1		243		191		190	130	143	120
1	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36
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1	32	33	34	35	36	178 31	32	33	34	35	36	31	32	33	34	35	36
•	32	30		135	30	3'	32	133	34	33	,	31	32	30	34		30
			271			<u> </u>	L	ļ				<u> </u>			1	155	
	18	South	3	1 East			18 9	South	3	2 East			18 Sc	nuth	33	East	
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	ł				400	82				ł			1		62		140
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	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
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	32	33	34	35	36	91	32	33	34	35	36	35 31	32	33	34	35	36
11	32	133	34	33	100	31	132	133	134	133	30	31	عدا	JJ	34	J	30

- 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 well to establish depth to water
- 143 NMOCD Groundwater map well location

SAMPLE LOG

Boring/Well: TMW-1 Dry Well in Sec 30 17S- 32E

Project Number: 114-6400224

Client: COG

Site Location: Pronghorn Section 30
Location: Lea County, New Mexico

Total Depth 180 Date Installed: 07/14/09

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
5-6		Brown fine grain sand
10-11		Buff limestone
15-16		Tan to buff calcareous sand with chert intermixed.
20-21		Tan calcareous sand
25-26		Tan fine grain sand
30-31		Tan to yellow sandy clay
35-36		Reddish clayey sand with gravel
40-41		Red gravelly fine grain sand
<u>45-46</u>		Red to buff gravelly calcareous sand
50-51	•-	Red fine grain sand
55-56		Red sandy silt
60-61		Red silty clay (dry)
65-66		Red coarse grain sandy clay
70-71		Red fine grain sand
75-76		Red fine grain sand
80-81		Red gravelly sand
85-86		Red fine grain silty clay with some sand intermixed
90-91		Red fine grain silty clay with some sand intermixed
95-96		Red fine grain silty clay with some sand intermixed
100-101		Red fine grain silty clay with some sand intermixed
105-106		Tan red fine grain sand
110-111		Tan fine grain sand
115-116		Tan fine grain sand
120-121		Tan to red fine grain sand
130-131		Red clay of high plasticity (Red bed)
140-141	-	Red clay of high plasticity (Red bed)
150-151		Red clay of high plasticity (Red bed) intermixed with gravel
160-161		Red clay of high plasticity (Red bed) intermixed with gravel
170-171		Red clay of high plasticity (Red bed) intermixed with gravel
180-181		Red clay of high plasticity (Red bed)

Total Depth is 181 feet

Groundwater was not encountered

Work Order: 10081706 Report Date: August 25, 2010 Page Number: 1 of 2

Summary Report

Ike Tavarez Tetra Tech

1910 N. Big Spring Street

Midland, TX 79705

Report Date: August 25, 2010

Work Order: 10081706

Project Name:

Project Location: Lea County, NM

Project Number: 114-6400646

COG/GC Federal #13

		•	Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
241460	AH-1 0-1	soil	2010-08-16	00:00	2010-08-16
241461	AH-1 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241462	AH-1 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241463	AH-2 0-1'	soil	2010-08-16	00:00	2010-08-16
241464	AH-2 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241465	AH-2 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241466	AH-2 3-3.5'	soil	2010-08-16	00:00	2010-08-16
241467	AH-2 4-4.5'	soil	2010-08-16	00:00	2010-08-16

	BTEX				TPH DRO - NEW	TPH GRO
]	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
241460 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00
241463 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<2.00

Sample: 241460 - AH-1 0-1'

Param	Flag	Result	\mathbf{Units}	RL
Chloride		3920	mg/Kg	4.00

Sample: 241461 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		573	mg/Kg	4.00

Report Date: August 25, 2010		Work Order: 10081706	Page	Page Number: 2 of 2	
Sample: 241462	- AH-1 2-2.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 241463	- AH-2 0-1'				
Param	Flag	Result	Units	RL	
Chloride		1440	mg/Kg	4.00	
Sample: 241464	- AH-2 1-1.5'				
Param	Flag	Result	Units	RL	
Chloride		433	mg/Kg	4.00	
Sample: 241465	- AH-2 2-2.5'				
Param	Flag	Result	Units	RL	
Chloride		594	mg/Kg	4.00	
Sample: 241466	- AH-2 3-3.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 241467	- AH-2 4-4.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 6015 Harris Parkway, Suite 110

El Paso, Texas 79922 Midland, Texas 79703 Ft. Worth, Texas 76132 800 • 378 • 1296 888 • 588 • 3443

806 • 794 • 1296 915 • 585 • 3443 432 • 689 • 6301

FAX 806 • 794 • 1298 FAX 915+585+4944

817 - 201 - 5260

FAX 432 • 689 • 6313

E-Mail: tab@traceanalysis.com

Certifications

WBENC: 237019

HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA

WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

LELAP-02003

El Paso:

T104704221-08-TX LELAP-02002

Midland:

T104704392-08-TX

Kansas E-10317

Analytical and Quality Control Report

Ike Tavarez Tetra Tech

1910 N. Big Spring Street

Report Date: August 25, 2010

Midland, TX, 79705

Work Order: 10081706

Project Location: Lea County, NM Project Name:

COG/GC Federal #13

Project Number:

114-6400646

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
241460	AH-1 0-1'	soil	2010-08-16	00:00	2010-08-16
241461	AH-1 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241462	AH-1 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241463	AH-2 0-1'	soil	2010-08-16	00:00	2010-08-16
241464	AH-2 1-1.5'	soil	2010-08-16	00:00	2010-08-16
241465	AH-2 2-2.5'	soil	2010-08-16	00:00	2010-08-16
241466	AH-2 3-3.5'	soil	2010-08-16	00:00	2010-08-16
241467	AH-2 4-4.5'	soil	2010-08-16	00:00	2010-08-16

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 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael april

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

Standard Flags

 ${f B}\,$ - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project COG/GC Federal #13 were received by TraceAnalysis, Inc. on 2010-08-16 and assigned to work order 10081706. Samples for work order 10081706 were received intact at a temperature of 18.0 C.

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

		Prep	Prep	$_{ m QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	62423	2010-08-21 at 17:00	72813	2010-08-22 at 10:38
Chloride (Titration)	SM 4500-Cl B	62441	2010-08-23 at 09:03	72832	2010-08-23 at 14:43
Chloride (Titration)	SM 4500-Cl B	62442	2010-08-23 at 09:04	72833	2010-08-23 at 14:44
TPH DRO - NEW	S 8015 D	62428	2010-08-20 at 13:56	72812	2010-08-20 at 13:56
TPH GRO	S 8015 D	62423	2010-08-21 at 17:00	72815	2010-08-22 at 11:05

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 10081706 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.

Samples were received on ice.

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.

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 4 of 16 Lea County, NM

Analytical Report

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 72813 Prep Batch: 62423 Analytical Method: S 8021B Date Analyzed: 2010-08-22 Sample Preparation: 2010-08-21

Prep Method: S 5035 Analyzed By: AG Prepared By: AG

RL

Parameter	Flag	Result	Units	Dilution	$\dot{ m RL}$
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.68	mg/Kg	1	2.00	84	52.8 - 137
4-Bromofluorobenzene (4-BFB)		1.50	mg/Kg	1	2.00	75	38.4 - 157

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)
QC Batch: 72832
Prep Batch: 62441

Analytical Method: SM 4500-Cl B Date Analyzed: 2010-08-23 Sample Preparation: 2010-08-23

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

RL

Parameter	Flag	Result	$\mathbf{U}_{\mathbf{nits}}$	Dilution	RL
Chloride		3920	mg/Kg	100	4.00

Sample: 241460 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW QC Batch: 72812 Prep Batch: 62428

Analytical Method: S 8015 D
Date Analyzed: 2010-08-20
Sample Preparation: 2010-08-20

Prep Method: N/A Analyzed By: kg Prepared By: kg

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO		< 50.0	mg/Kg	1	50.0

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 5 of 16 Lea County, NM

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		104	mg/Kg	1	100	104	70 - 130

Sample: 241460 - AH-1 0-1'

Laboratory:

Midland

TPH GRO Analysis: QC Batch: 72815 Prep Batch: 62423

Analytical Method: S 8015 D. Date Analyzed: 2010-08-22

2010-08-21

Prep Method: S 5035 Analyzed By: \mathbf{AG} Prepared By: AG

RL

Sample Preparation:

Parameter	Flag	Result	Units	Dilution	RL
GRO		< 2.00	mg/Kg	1	2.00

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.86	mg/Kg	1	2.00	93	48.5 - 152
4-Bromofluorobenzene (4-BFB)		1.59	mg/Kg	1	2.00	80	42 - 159

Sample: 241461 - AH-1 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72832 Prep Batch: 62441

Analytical Method: SM 4500-Cl B Date Analyzed: 2010-08-23 Sample Preparation: 2010-08-23

Prep Method: N/A Analyzed By: AR Prepared By: AR

RLParameter Result Units Dilution RLFlag 573 Chloride mg/Kg 4.00

Sample: 241462 - AH-1 2-2.5'

Laboratory:

Midland

Chloride (Titration) Analysis: QC Batch: 72832Prep Batch: 62441

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2010-08-23 2010-08-23

N/A Prep Method: Analyzed By: ARPrepared By: AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 6 of 16 Lea County, NM

Sample: 241463 - AH-2 0-1'

Laboratory: Analysis: QC Batch:

Prep Batch:

Midland BTEX 72813

62423

Analytical Method: Date Analyzed:

Sample Preparation:

S 8021B 2010-08-22

2010-08-21

Prep Method: S 5035 Analyzed By: AG Prepared By: AG

RL

		100			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xvlene		< 0.0200	mg/Kg	1	0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluenc (TFT)	1	0.943	mg/Kg	1	2.00	47	52.8 - 137
4-Bromofluorobenzene (4-BFB)		0.847	mg/Kg	1	2.00	42	38.4 - 157

Sample: 241463 - AH-2 0-1'

Laboratory:

Prep Batch:

Chloride

Midland

Chloride (Titration) Analysis: QC Batch:

72832 62441 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2010-08-23

2010-08-23

Prep Method: Analyzed By: Prepared By:

AR AR

N/A

kg

Parameter Flag

RL

RLResult Dilution Units 1440 mg/Kg 100 4.00

Sample: 241463 - AH-2 0-1'

Laboratory: Midland

Analysis:

TPH DRO - NEW

QC Batch: 72812 Prep Batch: 62428

Analytical Method: Date Analyzed:

S 8015 D 2010-08-20 Sample Preparation: 2010-08-20 Prep Method: N/A Analyzed By: kg Prepared By:

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO		< 50.0	mg/Kg	1	50.0

¹SPECIAL-TFT is out of control limits due to an unknown anomaly. However, 4-BFB is within control limits and shows the method to be in control. •

114-6400646

Work Order: 10081706 COG/GC Federal #13

Page Number: 7 of 16 Lea County, NM

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		107	mg/Kg	1	100	107	70 - 130

Sample: 241463 - AH-2 0-1'

Laboratory: Analysis:

Prep Batch: 62423

QC Batch:

Midland TPH GRO 72815

Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D 2010-08-22 2010-08-21

Prep Method: S 5035 Analyzed By: AG

AG

Prepared By:

RL

Parameter	Flag	Result	Units	Dilution	RL
GRO		< 2.00	mg/Kg	1	2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.05	mg/Kg	1	2.00	52	48.5 - 152
4-Bromofluorobenzene (4-BFB)		0.908	mg/Kg	1	2.00	45	42 - 159

Sample: 241464 - AH-2 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72833 Prep Batch: 62442

Analytical Method: Date Analyzed:

SM 4500-Cl B 2010-08-23

Prep Method: N/A Analyzed By: AR

Prepared By:

Sample Preparation: 2010-08-23

AR

R.L Parameter Flag Result Units Dilution RLChloride 433 mg/Kg 50 4.00

Sample: 241465 - AH-2 2-2.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72833 Prep Batch: 62442

Analytical Method: Date Analyzed:

SM 4500-Cl B 2010-08-23

Prep Method: N/A Analyzed By: ARPrepared By: AR

Sample Preparation: 2010-08-23

		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		594	mg/Kg	50	4.00

114-6400646

Work Order: 10081706 COG/GC Federal #13

Page Number: 8 of 16 Lea County, NM

Sample: 241466 - AH-2 3-3.5'

Laboratory:

Midland

Chloride (Titration) Analysis:

72833

Analytical Method:

SM 4500-Cl B

2010-08-23

Prep Method: N/A Analyzed By:

QC Batch:

Date Analyzed:

AR

Prep Batch:

62442

Sample Preparation:

2010-08-23

Prepared By: AR

RL

Parameter Chloride

Flag

Result < 200

Dilution Units mg/Kg 50

RL4.00

Sample: 241467 - AH-2 4-4.5'

Laboratory:

Midland

Analysis:

Chloride

Chloride (Titration)

72833

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

Date Analyzed:

2010-08-23

Analyzed By: AR

Prep Batch:

62442

Sample Preparation: 2010-08-23 Prepared By:

Parameter Flag

RLResult < 200

Units mg/Kg

Dilution

50

AR

RL

4.00

Method Blank (1)

72812

QC Batch: 72812

Date Analyzed:

2010-08-20

Analyzed By: kg

Flag

Prep Batch: 62428

QC Preparation:

2010-08-20

Prepared By: kg

MDL

Parameter

QC Batch:

Flag

Result

Units

RL

DRO

<14.5

mg/Kg

50

Surrogate n-Tricosane

Result

Units

Spike

Percent

Recovery

98.6

Dilution

1

Amount 100

Recovery 99

Limits 70 - 130

Method Blank (1)

QC Batch: 72813

QC Batch:

72813

Date Analyzed:

2010-08-22

Analyzed By: AG

Benzene

Prep Batch: 62423

QC Preparation: 2010-08-21

mg/Kg

Prepared By:

Parameter Flag

MDL Result < 0.0150

Units mg/Kg

RL0.02

continued ...

Report Date: August 2 114-6400646			r: 10081706 Federal #13	Page Number: 9 of 16 Lea County, NM				
method blank continued	1			D.*				
Parameter	Flag		M Re:	DL	Unit	g.		RL
Toluene	riag		<0.00		mg/k			0.02
Ethylbenzene			<0.00		mg/k			0.02
Xylene			< 0.00		mg/k			0.02
					Spike	Percent	Rec	covery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery		mits
Trifluorotoluene (TFT)		1.83	mg/Kg	1	2.00	92	66.6	- 122
4-Bromofluorobenzene	(4-BFB)	1.32	mg/Kg	1	2.00	66	55.4	- 132
Method Blank (1) QC Batch: 72815 Prep Batch: 62423	QC Batch: 72815	Date Ana QC Prepa	•	2010-08-22 2010-08-21		Analyz Prepar		AG AG
D	F21		MDI		T:'1			DI
Parameter Flag GRO			Resul		Units			$\frac{RL}{2}$
		(1.00			mg/Kg		Z	
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery		overy mits
Trifluorotoluene (TFT)		2.07	mg/Kg	1	2.00	104		- 150
4-Bromofluorobenzene	(4-BFB)	1.43	mg/Kg	1	2.00	72	52.4	- 130
Method Blank (1) QC Batch: 72832 Prep Batch: 62441	QC Batch: 72832	- Date Anal QC Prepa	-	010-08-23 010-08-23		Analyzo	_	AR
r rep Datch. 02441		QC 1 repa	ilation. 2	V1V-VO-20		Prepare	a by:	AR
			MDI					
Parameter	Flag		Result		Units			RL
Chloride			<2.18		mg/Kg	5		4
16 (1 17) 1 (4)	0.00 0 1 00000							
Method Blank (1)	QC Batch: 72833							
QC Batch: 72833		Date Anal	•	010-08-23		Analyze		AR
Prep Batch: 62442		QC Prepa	ration: 2	010-08-23		Prepare	d By:	AR
			MDL					
Parameter	Flag		MDL Result		Units			RL

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 10 of 16 Lea County, NM

Laboratory Control Spike (LCS-1)

QC Batch:

72812

Date Analyzed:

2010-08-20

Analyzed By: kg

Prep Batch: 62428

QC Preparation: 2010-08-20 Prepared By: kg

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	241	mg/Kg	1	250	<14.5	96	57.4 - 133.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	234	mg/Kg	1	250	<14.5	94	57.4 - 133.4	3	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	110	108	mg/Kg	1	100	110	108	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:

72813

Date Analyzed:

2010-08-22

Analyzed By: AG Prepared By: AG

Prep Batch: 62423

QC Preparation: 2010-08-21

LCS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit Benzene 1.98 81.9 - 108 mg/Kg 1 2.00 < 0.0150 99 Toluene 1.87 81.9 - 107 mg/Kg 1 2.00 < 0.00950 94 Ethylbenzene 1.69 1 mg/Kg 2.00 < 0.0106 84 78.4 - 107 Xylene 5.09 mg/Kg 1 6.00 < 0.00930 85 79.1 - 107

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene	2.06	mg/Kg	1	2.00	< 0.0150	103	81.9 - 108	4	20
Toluene	1.95	mg/Kg	1	2.00	< 0.00950	98	81.9 - 107	4	20
Ethylbenzene	1.81	mg/Kg	1	2.00	< 0.0106	90	78.4 - 107	7	20
Xylene	5.43	mg/Kg	1	6.00	< 0.00930	90	79.1 - 107	6	20

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

g .	LCS	LCSD	TT 1.	D.1	Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	${ m Rec.}$	${f Limit}$
Trifluorotoluene (TFT)	1.66	1.61	mg/Kg	1	2.00	83	80	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.49	1.43	mg/Kg	1	2.00	74	72	69.8 - 121

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 11 of 16 Lea County, NM

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 62423

72815

Date Analyzed:

2010-08-22 QC Preparation: 2010-08-21

Analyzed By: AG Prepared By: AG

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	14.3	mg/Kg	1	20.0	< 1.65	72	69.9 - 95.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	14.2	mg/Kg	1	20.0	<1.65	71	69.9 - 95.4	1	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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.05	1.86	mg/Kg	1	2.00	102	93	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.64	1.51	mg/Kg	1	2.00	82	76	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 62441

72832

Date Analyzed:

2010-08-23 QC Preparation: 2010-08-23 Analyzed By: AR Prepared By: AR.

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.5	mg/Kg	1	100	< 2.18	98	85 - 115

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	<2.18	102	85 - 115	4	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:

72833 Prep Batch: 62442 Date Analyzed:

2010-08-23 QC Preparation: 2010-08-23 Analyzed By: AR Prepared By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	96.2	mg/Kg	1	100	<2.18	96	85 - 115

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

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 12 of 16 Lea County, NM

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	<2.18	102	85 - 115	6	20

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

Matrix Spike (MS-1)

Spiked Sample: 241463

QC Batch:

72812

Date Analyzed:

2010-08-20

Analyzed By: kg

Prep Batch: 62428

QC Preparation: 2010-08-20

Prepared By: kg

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	216	mg/Kg	1	250	<14.5	86	35.2 - 167.1

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	226	mg/Kg	1	250	<14.5	90	35.2 - 167.1	4	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	98.4	104	mg/Kg	1	100	98	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 241471

QC Batch: Prep Batch: 62423

72813

Date Analyzed:

QC Preparation: 2010-08-21

2010-08-22

Analyzed By: AG Prepared By: AG

		MS			Spike	Matrix		Rec.
Param		Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene	2	2.38	mg/Kg	1	2.00	< 0.0150	119	80.5 - 112
Toluene	3	2.32	mg/Kg	1	2.00	< 0.00950	116	82.4 - 113
Ethylbenzene		2.27	mg/Kg	1	2.00	< 0.0106	114	83.9 - 114
Xylene		6.80	mg/Kg	1	6.00	< 0.00930	113	84 - 114

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	$\mathbf{U}_{\mathbf{nits}}$	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene	2.16	mg/Kg	1	2.00	< 0.0150	108	80.5 - 112	10	20
Toluene	2.13	mg/Kg	1	2.00	< 0.00950	106	82.4 - 113	8	20
Ethylbenzene	2.10	mg/Kg	1	2.00	< 0.0106	105	83.9 - 114	8	20

continued ...

²Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

³Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 13 of 16 Lea County, NM

777	atrar	entree	continued		
110	COL NO.	204460	COlegeneracie	•	•

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Xylene	6.31	mg/Kg	1	6.00	< 0.00930	105	84 - 114	8	20

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

_	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	${ m Rec.}$	\mathbf{Limit}
Trifluorotoluene (TFT)	1.68	1.43	mg/Kg	1	2	84	72	41.3 - 117
4-Bromofluorobenzene (4-BFB)	1.57	1.28	mg/Kg	1	2	78	64	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 241593

QC Batch: 72815 Date Analyzed: 2010-08-22

Analyzed By: AG Prepared By: AG

Prep Batch: 62423

QC Preparation: 2010-08-21

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	16.6	mg/Kg	1	20.0	<1.65	83	61.8 - 114

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

	MSD			Spike	Matrix		${ m Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
GRO	16.4	mg/Kg	1	20.0	<1.65	82	61.8 - 114	1	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	${ m Re}c.$	Rec.	Limit
Trifluorotoluene (TFT)	1.70	2.03	mg/Kg	1	2	85	102	50 - 162
4-Bromofluorobenzene (4-BFB)	1.54	1.80	mg/Kg	1	2	77	90	50 - 162

Matrix Spike (MS-1) Spiked Sample: 241463

QC Batch: 72832 Prep Batch: 62441 Date Analyzed: 2010-08-23 QC Preparation: 2010-08-23

Analyzed By: AR Prepared By: AR

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	11400	mg/Kg	100	10000	1440	100	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD .
Param	Result	$_{ m Units}$	Dil.	Amount	Result	Rec.	Limit	RPD	\mathbf{Limit}
Chloride	12100	mg/Kg	100	10000	1440	107	85 - 115	6	20

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

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 14 of 16 Lea County, NM

Matrix Spike (MS-1)

Spiked Sample: 241476

QC Batch: Prep Batch: 62442

72833

Date Analyzed:

2010-08-23 QC Preparation: 2010-08-23

Analyzed By: AR

Prepared By: AR.

	MS			$_{ m Spike}$	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	10600	mg/Kg	100	10000	459	101	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	11000	mg/Kg	100	10000	459	105	85 - 115	4	20

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

Standard (CCV-1)

QC Batch: 72812

Date Analyzed: 2010-08-20

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	223	89	80 - 120	2010-08-20

Standard (CCV-2)

QC Batch: 72812

Date Analyzed: 2010-08-20

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	230	92	80 - 120	2010-08-20

Standard (CCV-1)

QC Batch: 72813

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene	•	mg/Kg	0.100	0.101	101	80 - 120	2010-08-22
Toluene		mg/Kg	0.100	0.0964	96	80 - 120	2010-08-22
Ethylbenzene		mg/Kg	0.100	0.0882	88	80 - 120	2010-08-22
Xylene		mg/Kg	0.300	0.266	89	80 - 120	2010-08-22

114-6400646

Work Order: 10081706 COG/GC Federal #13 Page Number: 15 of 16 Lea County, NM

Standard (CCV-2)

QC Batch: 72813

Date Analyzed: 2010-08-22

Analyzed By: AG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene	-	mg/Kg	0.100	0.105	105	80 - 120	2010-08-22
Toluene		mg/Kg	0.100	0.0994	99	80 - 120	2010-08-22
Ethylbenzene		mg/Kg	0.100	0.0915	92	80 - 120	2010-08-22
Xylene		mg/Kg	0.300	0.274	91	80 - 120	2010-08-22

Standard (CCV-1)

QC Batch: 72815

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	0.892	89	80 - 120	2010-08-22

Standard (CCV-2)

QC Batch: 72815

Date Analyzed: 2010-08-22

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	0.860	86	80 - 120	2010-08-22

Standard (ICV-1)

QC Batch: 72832

Date Analyzed: 2010-08-23

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-08-23

Standard (CCV-1)

QC Batch: 72832

Date Analyzed: 2010-08-23

Analyzed By: AR

Work Order: 10081706 COG/GC Federal #13 Page Number: 16 of 16

114-6400646

Lea	County,	NM
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			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.3	99	85 - 115	2010-08-23

Standard (ICV-1)

QC Batch: 72833

Date Analyzed: 2010-08-23

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.4	99	85 - 115	2010-08-23

Standard (CCV-1)

QC Batch: 72833

Date Analyzed: 2010-08-23

Analyzed By: AR

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-08-23

RUSH Charge Authorizad: Major Anlans/Cations, pH, TDS OF: AIRBILL P. . Laboratory retains Yellow copy - Return Orginal copy to Tetra fech - Project Manager retains Pink copy - Accounting receives Gold copy (SotsedaA) MJ9 STEEP. (Circle or Specify Method No.) (riA) ated ariqiA ANALYSIS REQUEST 808/808 3994 H2/12 PAGE PCB's 8080/808 HAND DELINERED VIPS
TETTA TECH CONTACT PERSON GC.MS Send. Vol. 6270/625 SAMPLE SHIPPED BY: (Circle FORK GC'W2 API: 8540\8580\854 SAMPLED BY: (Print & Initial) Court of 岩 Metals Ag As Ga Cd Vr Pd Hg Se RCRA Meteta Ag As Ba Cd Cr Pb Hg Se OTSB HAS H 8001XT COOM 8108 (Ext. to C35) BIEX 8021B PRESERVATIVE METHOD MONE **Analysis Request of Chain of Custody Record** desper horsons ÷ CE Partie Courte EONH нсг FILTERED (Y/N) NUMBER OF CONTAINERS Ĭ Ł (432) 682-4559 • Fax (432) 682-3946 If total TPH exceeds how my RECEIVED 8Y: (Signature) RECEIVED BY: (Signature) SAMPLE IDENTIFICATION **TETRA TECH** Midland, Texas 79705 1910 N. Big Spring St. Ik Farure Fidual "13 4. G, NM SITE MANAGER: Orde, #: 100817-06 3-8.5 <:2-2 ---S:2-2 ر د د <u>, '</u>.' 77 0 HEMAPRICS: じ Ą AH- 2 AH-7 トキャ PROJECT NAME 1-44 4H Time: AH g PHONE Þ 8490 lease fill out all coples COME XIRTAM 7) ADDRESS: CITY AND STATE CONTACT:
SAMPLE CONDITION WHEN RECEIVED: TIME HELINOUISHED BY: (Signatum) RELINCUISHED BY: (Signature) RELINGUISHED BY: (Signatura) RECENTING LABORATORY: DATE ZOID 8/16 24-64001-41 CLIENT NAME: PROJECT NO.: 24/4cm 4(0) LAB I.D. NUMBER 462 463 TIME 466 461 σ

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 1 of 3

Summary Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street

Report Date: February 23, 2011 Work Order: 11021803

Midland, TX 79705

Project Location: Lea County, NM Project Name: COG/GC Federal #13

Project Number: 114-6400646

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
257816	AH-1 0-1'	soil	2011-02-16	00:00	2011-02-17
257817	AH-1 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257818	AH-1 2-2.5°	soil	2011-02-16	00:00	2011-02-17
257819	AH-2 0-1'	soil	2011-02-16	00:00	2011-02-17
257820	AH-2 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257821	AH-2 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257822	AH-3 0-1'	soil	2011-02-16	00:00	2011-02-17
257823	AH-3 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257824	AH-3 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257825	AH-4 0-1'	soil	2011-02-16	00:00	2011-02-17
257826	AH-4 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257827	AH-4 2-2.5'	soil	2011-02-16	00:00	2011-02-17

]	BTEX	TPH DRO - NEW	TPH GRO	
	Benzene	Toluene	Ethylbenzene	Xylene	DRO [GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
257816 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00
257819 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00
257822 - AH-3 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	82.7	< 2.00
257825 - AH-4 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00

Sample: 257816 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		997	mg/Kg	4.00

Sample: 257817 - AH-1 1-1.5'

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: February 23, 2011		Work Order: 11021803	Page	Page Number: 2 of 3	
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 257818	- AH-1 2-2.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 257819	- AH-2 0-1'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 257820	- AH-2 1-1.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 257821	- AH-2 2-2.5'	·			
Param	Flag	Result	Units	RL	
Chloride	1 2006	<200	mg/Kg	4.00	
Sample: 257822 -	- AH-3 0-1'				
Param	Flag	Result	Units	RL	
Chloride		2160	mg/Kg	4.00	
Sample: 257823 -	- AH-3 1-1.5'				
Param	\mathbf{Flag}	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 257824 -	- AH-3 2-2.5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 3 of 3 Sample: 257825 - AH-4 0-1' Param Flag Result Units RLChloride <200 mg/Kg 4.00 Sample: 257826 - AH-4 1-1.5' Param Units RLFlag Result Chloride <200 mg/Kg 4.00 Sample: 257827 - AH-4 2-2.5' Param

Result

233

Units

mg/Kg

RL

4.00

Flag

Chloride



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite At 6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

Lubbock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703

800 • 378 • 1296 888 • 588 • 3443

806 • 794 • 1296 915 • 585 • 3443 432 • 689 • 6301 817 • 201 • 5260

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944 FAX 432 • 689 • 6313

E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019

HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

LELAP-02003

Kansas E-10317

El Paso: T104704221-08-TX

LELAP-02002

Midland: T104704392-08-TX

Analytical and Quality Control Report

Ike Tavarez Tetra Tech

1910 N. Big Spring Street Midland, TX, 79705

Report Date: February 23, 2011

Work Order: 11021803

Project Location: Lea County, NM Project Name: COG/GC Federal #13

114-6400646 Project Number:

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
257816	AH-1 0-1'	soil	2011-02-16	00:00	2011-02-17
257817	AH-1 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257818	AH-1 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257819	AH-2 0-1'	soil	2011-02-16	00:00	2011-02-17
257820	AH-2 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257821	AH-2 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257822	AH-3 0-1'	soil	2011-02-16	00:00	2011-02-17
257823	AH-3 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257824	AH-3 2-2.5'	soil	2011-02-16	00:00	2011-02-17
257825	AH-4 0-1'	soil	2011-02-16	00:00	2011-02-17

			Date	${f Time}$	Date
Sample	Description	Matrix	Taken	Taken	Received
257826	AH-4 1-1.5'	soil	2011-02-16	00:00	2011-02-17
257827	AH-4 2-2.5'	soil	2011-02-16	00:00	2011-02-17

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 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael abel

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

Standard Flags

 ${\bf B}\,$ - The sample contains less than ten times the concentration found in the method blank.

Samples for project COG/GC Federal #13 were received by TraceAnalysis, Inc. on 2011-02-17 and assigned to work order 11021803. Samples for work order 11021803 were received intact at a temperature of 7.2 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	66705	2011-02-21 at 12:05	77804	2011-02-21 at 12:05
Chloride (Titration)	SM 4500-Cl B	66703	2011-02-21 at 10:36	77796	2011-02-21 at 13:20
Chloride (Titration)	SM 4500-Cl B	66703	2011-02-21 at 10:36	77797	2011-02-21 at 13:20
TPH DRO - NEW	S 8015 D	66718	2011-02-21 at $09:51$	77781	2011-02-21 at 09:51
TPH GRO	S 8015 D	66705	2011-02-21 at 12:05	77805	2011-02-21 at 12:05

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 11021803 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.

114-6400646

Work Order: 11021803 COG/GC Federal #13

Page Number: 4 of 20 Lea County, NM

Analytical Report

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Analysis: **BTEX** QC Batch: 77804 Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed: Sample Preparation: 2011-02-21

2011-02-21

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

RI.

		1017			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene .		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	~	2.62	mg/Kg	1	2.00	131	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		3.06	mg/Kg	1	2.00	153	35.7 - 159.6

Sample: 257816 - AH-1 0-1'

Midland Laboratory:

Chloride (Titration) Analysis:

77796 QC Batch: Prep Batch: 66703

Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: AR. Prepared By: AR

		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		997	mg/Kg	100	4.00

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW QC Batch: 77781 Prep Batch: 66718

Analytical Method: S 8015 D Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: kg Prepared By: kg

		RL			
Parameter	Flag	Result	Units	Dilution	RL
DRO		< 50.0	mg/Kg	1	50.0

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 5 of 20 Lea County, NM

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		87.2	mg/Kg	1	100	87	70 - 130

Sample: 257816 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH GRO QC Batch: 77805 Prep Batch: 66705 Analytical Method: S 8015 D
Date Analyzed: 2011-02-21
Sample Preparation: 2011-02-21

Prep Method: S 5035
Analyzed By: ME
Prepared By: ME

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	-	2.70	mg/Kg	1	2.00	135	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.81	mg/Kg_	1	2.00	140	22.2 - 160.2

Sample: 257817 - AH-1 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Sample: 257818 - AH-1 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 77796 Prep Batch: 66703 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: AR Prepared By: AR

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 6 of 20 Lea County, NM

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: **BTEX** QC Batch: 77804 Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

RLParameter Flag Result Units Dilution RL< 0.0200 mg/Kg Benzene 1 0.0200 Toluene < 0.0200 mg/Kg 1 0.0200 mg/Kg Ethylbenzene < 0.0200 1 0.0200 Xylene 1 < 0.0200 mg/Kg 0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.54	mg/Kg	1	2.00	127	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		2.94	mg/Kg	1	2.00	147	35.7 - 159.6

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

77796 QC Batch: Prep Batch: 66703

Analytical Method: SM 4500-Cl B Date Analyzed:

2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: ARPrepared By: AR

RLFlag Result Units Dilution RLParameter Chloride <200 mg/Kg 50 4.00

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Prep Batch: 66718

Analysis: TPH DRO - NEW QC Batch: 77781

Analytical Method: Date Analyzed: Sample Preparation:

S 8015 D 2011-02-21 2011-02-21 Prep Method: N/A Analyzed By: kg Prepared By: kg

RLResult Units Dilution RLParameter Flag $\overline{\mathrm{DRO}}$ < 50.0 mg/Kg 50.0

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		78.7	mg/Kg	1	100	79	70 - 130

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 7 of 20 Lea County, NM

ME

Sample: 257819 - AH-2 0-1'

Laboratory: Midland

Analysis: TPH GRO QC Batch: 77805 Prep Batch: 66705

Analytical Method: Date Analyzed:

S 8015 D 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: ME

Prepared By:

RL

Parameter	Flag	Result	Units	Dilution	RL
GRO	<u> </u>	< 2.00	mg/Kg	1	2.00

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.55	mg/Kg	1	2.00	128	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.69	mg/Kg	1	2.00	134	22.2 - 160.2

Sample Preparation:

Sample: 257820 - AH-2 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 77796 Prep Batch: 66703

Analytical Method: SM 4500-Cl B Date Analyzed:

2011-02-21 2011-02-21

Prep Method: N/A Analyzed By: ARPrepared By: AR

RI.

		1(1)
Parameter	Flag	Result
Chloride		<200

Units	Dilution	RL
mg/Kg	50	4.00

Sample: 257821 - AH-2 2-2.5'

Laboratory:

Prep Batch:

Midland

66703

Analysis: Chloride (Titration) QC Batch: 77796

Analytical Method: SM 4500-Cl B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: AR Prepared By: AR

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample: 257822 - AH-3 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 77804 Prep Batch: 66705

Analytical Method: S 8021B Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: ME Prepared By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13

Page Number: 8 of 20 Lea County, NM

		m RL			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.28	mg/Kg	1	2.00	114	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		2.66_{-}	mg/Kg	1	2.00	133	35.7 - 159.6

Sample: 257822 - AH-3 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: ARPrepared By: AR

RLParameter Result Units Dilution RLFlag Chloride 2160 100 mg/Kg 4.00

Sample: 257822 - AH-3 0-1'

Laboratory:

Midland

Analysis: TPH DRO - NEW QC Batch: 77781

Prep Batch: 66718

Analytical Method: Date Analyzed: Sample Preparation:

S 8015 D 2011-02-21 2011-02-21 Prep Method: N/A Analyzed By: kg Prepared By: kg

RLUnits Parameter Flag Result Dilution RL $\overline{\text{DRO}}$ 82.7mg/Kg 50.0 C...:1. n.

					Бріке	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		124	mg/Kg	1	100	124	70 - 130

Sample: 257822 - AH-3 0-1'

Laboratory: Midland

TPH GRO Analysis: QC Batch: 77805 Prep Batch: 66705

Analytical Method: S 8015 D Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: ME Prepared By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 9 of 20 Lea County, NM

Parameter Fl.	ag	Result		Units		Dilution	RL
GRO		< 2.00		mg/Kg		1	2.00
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.34	mg/Kg	1	2.00	117	36.3 - 158.9
4-Bromofluorobenzene (4-BF	B)	2.48	mg/Kg	1	2.00	124	22.2 - 160.2

RL

Sample: 257823 - AH-3 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration)

77796

Analytical Method:

SM 4500-Cl B

Prep Method: N/A AR

QC Batch: Prep Batch: 66703 Date Analyzed: 2011-02-21 Sample Preparation: 2011-02-21 Analyzed By: Prepared By: AR

ът

		R.L			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample: 257824 - AH-3 2-2.5'

Laboratory:

Midland

Analysis: QC Batch: 77796

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-02-21

Prep Method: N/A Analyzed By:

Prep Batch: 66703

Sample Preparation:

AR Prepared By: AR

RLParameter Result Flag Chloride <200 2011-02-21

Units

mg/Kg

Dilution RL50 4.00

ME

0.0200

Sample: 257825 - AH-4 0-1'

Laboratory: Midland

Analysis: **BTEX** QC Batch: 77804 Prep Batch: 66705

Parameter

Ethylbenzene

Benzene

Toluene

Xylene

Analytical Method: Date Analyzed: Sample Preparation:

< 0.0200

S 8021B 2011-02-21 2011-02-21

mg/Kg

Prep Method: S 5035 Analyzed By: ME

Prepared By:

1

Flag

RL Result Units Dilution RL0.0200 < 0.0200 mg/Kg 1 < 0.0200 mg/Kg 0.0200< 0.0200 1 0.0200mg/Kg

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 10 of 20 Lea County, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.45	mg/Kg	1	2.00	122	51.6 - 149.2
4-Bromofluorobenzene (4-BFB)		2.78	$_{ m mg/Kg}$	1	2.00	139	35.7 - 159.6

Sample: 257825 - AH-4 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77796 Prep Batch: 66703 Analytical Method: Date Analyzed: SM 4500-Cl B 2011-02-21 Prep Method: N/A Analyzed By: AR

Prep Batch: 66703

Sample Preparation: 2011-02-21

Prepared By: AR

		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		<200	mg/Kg	50	4.00

Sample: 257825 - AH-4 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 77781 Prep Batch: 66718 Analytical Method:
Date Analyzed:

S 8015 D 2011-02-21 2011-02-21 Prep Method: N/A
Analyzed By: kg
Prepared By: kg

Sample Preparation:

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		87.4	mg/Kg	1	100	87	70 - 130

Sample: 257825 - AH-4 0-1'

Laboratory: Midland

Analysis: TPH GRO QC Batch: 77805 Prep Batch: 66705 Analytical Method: S 8015 D
Date Analyzed: 2011-02-21
Sample Preparation: 2011-02-21

Prep Method: S 5035 Analyzed By: ME Prepared By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13

Page Number: 11 of 20 Lea County, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.50	mg/Kg	1	2.00	125	36.3 - 158.9
4-Bromofluorobenzene (4-BFB)		2.56	mg/Kg	1	2.00	128	22.2 - 160.2

Sample: 257826 - AH-4 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 77797 Prep Batch: 66703 Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-02-21 Sample Preparation:

Analyzed By: \mathbf{AR} Prepared By: 2011-02-21 AR

RLParameter Result Units Dilution RLFlag <200 Chloride mg/Kg 50 4.00

Sample: 257827 - AH-4 2-2.5'

Laboratory: Midland

Chloride (Titration) Analysis:

QC Batch: 77797 Prep Batch: 66703 Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-02-21 Sample Preparation: 2011-02-21

Prep Method: N/A Analyzed By: ARPrepared By: AR

Prep Method:

N/A

RLParameter Flag Result Units Dilution RLChloride 233 mg/Kg 50 4.00

Method Blank (1) QC Batch: 77781

QC Batch: 77781 Prep Batch: 66718 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: kg Prepared By:

MDL Flag Result Units RLParameter DRO <15.7 mg/Kg 50

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		74.8	mg/Kg	1	100	75	70 - 130

Report Date: February 23, 2011 Work Order: 11021803 Page Number: 12 of 20 114-6400646 COG/GC Federal #13 Lea County, NM Method Blank (1) QC Batch: 77796 QC Batch: Analyzed By: AR 77796 Date Analyzed: 2011-02-21 Prep Batch: 66703 QC Preparation: 2011-02-21 Prepared By: ARMDL Result Parameter Flag Units RLChloride <2.18 mg/Kg 4 Method Blank (1) QC Batch: 77797 QC Batch: Analyzed By: AR 77797 Date Analyzed: 2011-02-21 Prepared By: Prep Batch: 66703 QC Preparation: 2011-02-21 ARMDL Parameter Flag Result Units RLChloride < 2.18 mg/Kg Method Blank (1) QC Batch: 77804 QC Batch: Analyzed By: 77804 Date Analyzed: 2011-02-21 MEPrep Batch: 66705 QC Preparation: 2011-02-21 Prepared By: MEMDL Parameter Flag Result Units RLBenzene < 0.0118 mg/Kg 0.02Toluene < 0.00600 0.02 mg/Kg Ethylbenzene < 0.00850 mg/Kg 0.02 Xylene < 0.00613 mg/Kg 0.02Spike Percent Recovery Surrogate Flag Units Dilution Amount Recovery Limits Result Trifluorotoluene (TFT) mg/Kg 2.0012070.8 - 123.5 2.41 1 4-Bromofluorobenzene (4-BFB) 2.56 1 2.00 128 48.8 - 134 mg/Kg Method Blank (1) QC Batch: 77805

QC Preparation: 2011-02-21

2011-02-21

Analyzed By:

Prepared By:

ME

ME

Date Analyzed:

QC Batch:

Prep Batch: 66705

77805

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 13 of 20 Lea County, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.38	mg/Kg	1	2.00	119	74.6 - 127.8
4-Bromofluorobenzene (4-BFB)		2.50	mg/Kg	_1	2.00_	125	32.9 - 129.8

Laboratory Control Spike (LCS-1)

QC Batch:

DRO

77781 Prep Batch: 66718 Date Analyzed: QC Preparation:

mg/Kg

2011-02-21 2011-02-21

1

250

Analyzed By: kg Prepared By:

LCS Spike Dil. Param Result Units Amount

206

Matrix Rec. Result Rec. Limit < 15.782 47.5 - 144.1

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

LCSD Spike RPD Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit RPD Limit 84 $\overline{\text{DRO}}$ 250 <15.7 47.5 - 144.1 20 210mg/Kg

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	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	99.2	99.7	mg/Kg	1	100	99	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:

77796

Date Analyzed:

2011-02-21

Analyzed By: AR Prepared By: AR

Prep Batch: 66703

2011-02-21 QC Preparation:

LCS Spike Matrix Rec. Dil. Amount Result Param Result Units Rec. Limit Chloride 94.9 mg/Kg 100 < 2.1895 85 - 115

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	104	mg/Kg	1	100	< 2.18	104	85 - 115	9	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:

77797

Date Analyzed:

2011-02-21

Analyzed By: AR

Prep Batch: 66703

QC Preparation:

2011-02-21

Prepared By: AR

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 14 of 20 Lea County, NM

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.5	mg/Kg	1	100	<2.18	98	85 - 115

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	103	mg/Kg	1	100	<2.18	103	85 - 115	6	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: 77804 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene	1.86	mg/Kg	1	2.00	< 0.0118	93	76.4 - 118.4
Toluene	1.92	mg/Kg	1	2.00	< 0.00600	96	81.8 - 111.9
Ethylbenzene	1.94	mg/Kg	1	2.00	< 0.00850	97	81.1 - 112.2
Xylene	5.92	mg/Kg	1	6.00	< 0.00613	99	81.7 - 111.5

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene	1.88	mg/Kg	1	2.00	< 0.0118	94	76.4 - 118.4	1	20
Toluene	1.93	mg/Kg	1	2.00	< 0.00600	96	81.8 - 111.9	0	20
Ethylbenzene	1.98	mg/Kg	1	2.00	< 0.00850	99	81.1 - 112.2	2	20
Xylene	5.96	mg/Kg	1	6.00	< 0.00613	99	81.7 - 111.5	1	20

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

Surrogate	$rac{LCS}{Result}$	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.05	2.03	mg/Kg	1	2.00	102	102	69 - 123.3
4-Bromofluorobenzene (4-BFB)	2.42	2.41	mg/Kg	1	2.00	121	120	64.9 - 131.9

Laboratory Control Spike (LCS-1)

QC Batch: 77805 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	17.1	mg/Kg	1	20.0	< 0.753	86	61.8 - 97

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 15 of 20 Lea County, NM

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	17.0	mg/Kg	1	20.0	< 0.753	85	61.8 - 97	1	20

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

	LCS	LCSD			Spike	LCS	LCSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec .	Limit
Trifluorotoluene (TFT)	2.13	2.07	mg/Kg	1	2.00	106	104	74.6 - 124
4-Bromofluorobenzene (4-BFB)	2.29	2.22	mg/Kg	1	2.00	114	111	53.9 - 121.1

Matrix Spike (MS-1) Spiked Sample: 258012

QC Batch: 77781

Date Analyzed: 20

2011-02-21

Analyzed By: kg Prepared By: kg

Prep Batch: 66718

QC Preparation: 2011-02-21

Rec.

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	595	mg/Kg	1	250	334	104	11.7 - 152.3

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	709	mg/Kg	1	250	334	150	11.7 - 152.3	18	20

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

		MS	MSD			Spike	MS	MSD	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	1 2	142	161	mg/Kg	1	100	142	161	70 - 130

Matrix Spike (MS-1) Spiked Sample: 257825

QC Batch: 77796 Prep Batch: 66703 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: AR Prepared By: AR

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	10100	mg/Kg	100	10000	<218	99	85 - 115

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

¹ High surrogate recovery due to peak interference.

²High surrogate recovery due to peak interference.

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 16 of 20 Lea County, NM

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	$_{ m RPD}$	Limit
Chloride	10500	mg/Kg	100	10000	<218	103	85 - 115	4	20

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

Matrix Spike (MS-1)

Spiked Sample: 257845

QC Batch: 77797 Prep Batch: 66703 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: AR Prepared By: AR

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	11600	mg/Kg	100	10000	1350	102	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	${ m Re}c.$	Limit	RPD	Limit
Chloride	12000	mg/Kg	100	10000	1350	106	85 - 115	3	20

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

Matrix Spike (MS-1) Spi

MS-1) Spiked Sample: 257853

QC Batch: 77804 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene	1.93	mg/Kg	1	2.00	< 0.0118	96	65.5 - 139.8
Toluene	2.10	mg/Kg	1	2.00	0.2359	93	70.5 - 137.3
Ethylbenzene	2.33	mg/Kg	1	2.00	0.3461	99	66.7 - 151
Xylene	7.35	mg/Kg	1	6.00	1.2225	102	68.7 - 149.5

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit	RPD	Limit
Benzene	1.91	mg/Kg	1	2.00	< 0.0118	96	65.5 - 139.8	1	20
Toluene	2.10	mg/Kg	1	2.00	0.2359	93	70.5 - 137.3	0	20
Ethylbenzene	2.44	mg/Kg	1	2.00	0.3461	105	66.7 - 151	5	20
Xylene	7.52	mg/Kg	1	6.00	1.2225	105	68.7 - 149.5	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	${ m Rec.}$	Limit
Trifluorotoluene (TFT)	2.55	2.54	mg/Kg	1	2	128	127	50.9 - 152.9

continued ...

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 17 of 20 Lea County, NM

matrix spikes continued ...

		MS	WSD			Бріке	MD	MSD	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
4-Bromofluorobenzene (4-BFB)	3 4	3.49	3.51	mg/Kg	1	2	174	176	48.5 - 165.8

Matrix Spike (MS-1) Spiked

Spiked Sample: 257849

QC Batch: 77805 Prep Batch: 66705 Date Analyzed: 2011-02-21 QC Preparation: 2011-02-21

Analyzed By: ME Prepared By: ME

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil .	Amount	Result	Rec.	Limit
GRO	16.1	mg/Kg	1	20.0	< 0.753	80	63 - 108.5

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

	MSD			Spike	Matrix		${ m Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	17.6	mg/Kg	1	20.0	< 0.753	88	63 - 108.5	9	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	${ m Rec.}$	Limit
Trifluorotoluene (TFT)	2.63	2.69	mg/Kg	1	2	132	134	54.1 - 154.3
4-Bromofluorobenzene (4-BFB)	2.87	2.93	mg/Kg	1	2	144	146	41.9 - 162.8

Standard (CCV-1)

QC Batch: 77781

Date Analyzed: 2011-02-21

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	$\operatorname{Recovery}$	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	208	83	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77781

Date Analyzed: 2011-02-21

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO	<u> </u>	mg/Kg	250	225	90	80 - 120	2011-02-21

³ High surrogate recovery due to peak interference.

⁴ High surrogate recovery due to peak interference.

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 18 of 20 Lea County, NM

Standard (ICV-1)

QC Batch: 77796

Date Analyzed: 2011-02-21

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	103	103	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77796

Date Analyzed: 2011-02-21

Analyzed By: AR

		4	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	97.4	97	85 - 115	2011-02-21

Standard (ICV-1)

QC Batch: 77797

Date Analyzed: 2011-02-21

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.1	. 99	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77797

Date Analyzed: 2011-02-21

Analyzed By: AR

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2011-02-21

Standard (CCV-1)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCV_{S}	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.103	103	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.106	106	80 - 120	2011-02-21

continued ...

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 19 of 20 Lea County, NM

standard continued ...

			$\overset{ ext{CCVs}}{=}$	CCVs	CCVs	Percent	_
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Ethylbenzene		mg/Kg	0.100	0.104	104	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.317	106	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene	* 100	mg/Kg	0.100	0.0959	96	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.0984	98	80 - 120	2011-02-21
Ethylbenzene		mg/Kg	0.100	0.0988	99	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.300	100	80 - 120	2011-02-21

Standard (CCV-3)

QC Batch: 77804

Date Analyzed: 2011-02-21

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.0943	94	80 - 120	2011-02-21
Toluene		mg/Kg	0.100	0.0956	96	80 - 120	2011-02-21
Ethylbenzene		mg/Kg	0.100	0.0955	96	80 - 120	2011-02-21
Xylene		mg/Kg	0.300	0.289	96	80 - 120	2011-02-21

Standard (CCV-1)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.10	110	80 - 120	2011-02-21

Standard (CCV-2)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

114-6400646

Work Order: 11021803 COG/GC Federal #13 Page Number: 20 of 20

Lea County, NM

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.02	102	80 - 120	2011-02-21

Standard (CCV-3)

QC Batch: 77805

Date Analyzed: 2011-02-21

Analyzed By: ME

			CCVs True	CCVs Found	${ m CCVs} \ { m Percent}$	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.07	107	80 - 120	2011-02-21

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ACIE Laster-Midland

Date: 3 - 16 -1 RUSH Charges Authorized: Yes (Resurts by: Major Anione/Cations, pH, TDS P. AIRBILL F. Please fill out all copies - Laboratory retains Yallow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy. OTHER. (Circle or Specify Method No.) ANALYSIS REQUEST a Tavarez PAGE **5CB**₽ **8080**208 GC:WS 80mil. Vol. 8270/625 GC:W2 API: 8540/8560/854 Ike LCCP Semi volatiles Metais Ag As Ba Cd Vr Pd Hg Se BAS AS BR Cd Cr Pb Hg Se OYS8 HA9 (Ext. to C35) 2001XT 8016 MOD. HGI BTEX 8021B PRESERVATIVE METHOD HONE Analysis Request of Chain of Custody Record ICE EONH ğ FILTERED (YM) NUMBER OF CONTAINERS (432) 682-4559 • Fax (432) 682-3946 RECEIVED 6% (Signature) Lea C NM SAMPLE IDENTIFICATION RECEIVED BY: (Signature) **TETRA TECH** 1910 N. Big Spring St. Midland, Texas 79705 8-85 5.55 The Taurez 2-2.5 3.35 7-75 I.S. Federal #13 STE MANAGER x wo #: 11031803 REMARKS 444 ä 44-4 24.4 444-4 41-4 AH-4 PROJECT NAME Darte: Time: BARD COMP **XIFITAM** STATE RECEIVING LABORATORY: TEAL & SAMPLE CONDITION WHEN RECEIVED: TIME INTOC RELINQUISHED BT: (Signeture) RELINGUISMED BY (SANGALIN) RELINOVISHED BY: (Signature) 14-6400646 DATE SOW 2/[[6 CITY: M. of land 500 PROJECT NO.: CLIENT NAME: 827 839 830 SOFF BOLD 832 LAB I.D. NUMBER 898 833 831