#### SITE INFORMATION Report Type: Closure Report General Site Information: **Dodd Federal Unit Water Flood** Site: COG Operating LLC Company: Section, Township and Range Sec 15 T17S R29E Unit I Lease Number: API-30-015-02987 **Eddy County** County: GPS: 32.83275° N 104.05684° W Surface Owner: **Federal** Mineral Owner: In Loco Hills, from the intersection of Hwy 82 and CR 217 travel west on Hwy 82 for 4.3 miles, Directions: turn right and travel 100 feet, turn right and travel 0.4 miles, turn left and travel 0.6 miles to site. Release Data: Date Released: 5/6/2011 Produced Water Type Release: Source of Contamination: Produced water overflow tank Fluid Released: 100 bbls Fluids Recovered: 98 bbls Official Communication Name: Pat Ellis Ike Tavarez Company: COG Operating, LLC Tetra Tech Address: 550 W. Texas Ave. Ste. 1300 1910 N. Big Spring P.O. Box City: Midland Texas, 79701 Midland, Texas Phone number: (432) 686-3023 (432) 682-4559 Fax: (432) 684-7137 Email: pellis@conchoresources.com ike.tavarez@tetratech.com

Ranking Score	Site Data
20	
10	10
0	
Ranking Score	Site Data
20	
0	0
Ranking Score	Site Data
20	
. 10	
0	0
	20 10 0  Ranking Score 20 0  Ranking Score 20 20 20 20 20 20 20

Acceptable Soil RRAL (mg/kg)									
Benzene	Total BTEX	TPH							
10	50	1,000							





May 10, 2012

Mr. Mike Bratcher **Environmental Engineer Specialist** Oil Conservation Division, District 2 1301 West Grand Avenue Artesia, New Mexico 88210

Re: Closure Report for the COG Operating LLC., Dodd Federal Unit Water Flood, Unit: I, Section 15, Township 17 South, Range 29 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the Dodd Federal Unit Water Flood located in Unit I, Section 15, Township 17 South, Range 29 East, Eddy County. New Mexico (Site). The spill site coordinates are N 32.83275°, W 104.05684°. The site location is shown on Figures 1 and 2.

### Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on May 6, 2011, and released approximately one hundred (100) barrels of produced fluid from the produced water overflow tank. Ninety Eight (98) barrels of standing fluids were recovered. measured approximately 45' x 85' and was completely contained inside the firewall of the facility. The initial C-141 form is enclosed in Appendix A.

### Groundwater

No water wells were listed within Section 17. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 75' below surface. The average depth to groundwater map is shown in Appendix B.



### Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a 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 1,000 mg/kg.

### Soil Assessment and Analytical Results

On May 31, 2011, Tetra Tech personnel inspected and sampled the spill area. Four (4) auger holes (AH-1, AH-2, AH-3 and AH-4) were installed using a stainless steel hand auger to assess the impacted soils. Due to the tanks, lines and structures, additional auger holes were not installed at the site. 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 C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the auger holes were below the RRAL for TPH and BTEX. The area of AH-4 showed a shallow chloride impact to the soils, which declined to 237 mg/kg at 2-2.5' below surface. The chloride impact was not vertically defined in auger holes (AH-1, AH-2 and AH-3), with bottom hole samples of 10,100 mg/kg at 1-1.5', 1,560 mg/kg at 9-9.5' and 2,060 mg/kg at 9-9.5', respectively.

On September 23, 2011, Tetra Tech personnel supervised the installation of soil borings (SB-1, SB-2 and SB-3) utilizing an air rotary drilling rig. Soil samples were collected to a depth of 60.0' below surface to define the chloride impact. Referring to Table 1, chloride concentrations declined with depth to <200 mg/kg at 60.0' (SB-1) and <200 mg/kg at 40.0' (SB-2) and <200 mg/kg at 40.0' (SB-3). The soil boring locations are shown on Figure 3.



### Site Remediation

On March 2012, Tetra Tech personnel supervised the excavation of the site. The proposed excavation depths proposed in work plan were met as stated in the approved work plan. Approximately 240 yards<sup>3</sup> were removed and disposed of at CRI.

Once excavated to the appropriate depths, confirmation samples were collected from the excavation. Tetra Tech collected (14) fourteen sidewall and four (4) bottom hole confirmation samples for chloride evaluation. The sampling results are summarized in Table 1. Referring to Table 1, all of the confirmation samples showed chloride concentrations ranging from <200 mg/kg to 682 mg/kg, with the exceptions of CS-3, CS-7, CS-9, CS-11 and CS-12, which showed chloride concentrations of 14,300 mg/kg, 26,500 mg/kg, 7,450 mg/kg, 15,200 mg/kg, and 24,600 mg/kg, respectively. These locations were not accessible due to the facility equipment and lines. COG requested to defer the remaining impact until the abandonment of the facility.

Once completed, the excavation bottoms in the areas of BH-1, BH-2, and BH-3 were lined with clay (approximately 0.5' thick). On March 4, 2012, BLM representative inspected the excavations and approved the remediation activities. The excavations were backfilled with clean soil and to grade.

Based on the remediation activities performed at this location, COG request closure for site. The C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities performed at the site, please call me at (432) 682-4559.

Respectfully submitted,

TETRA TECH

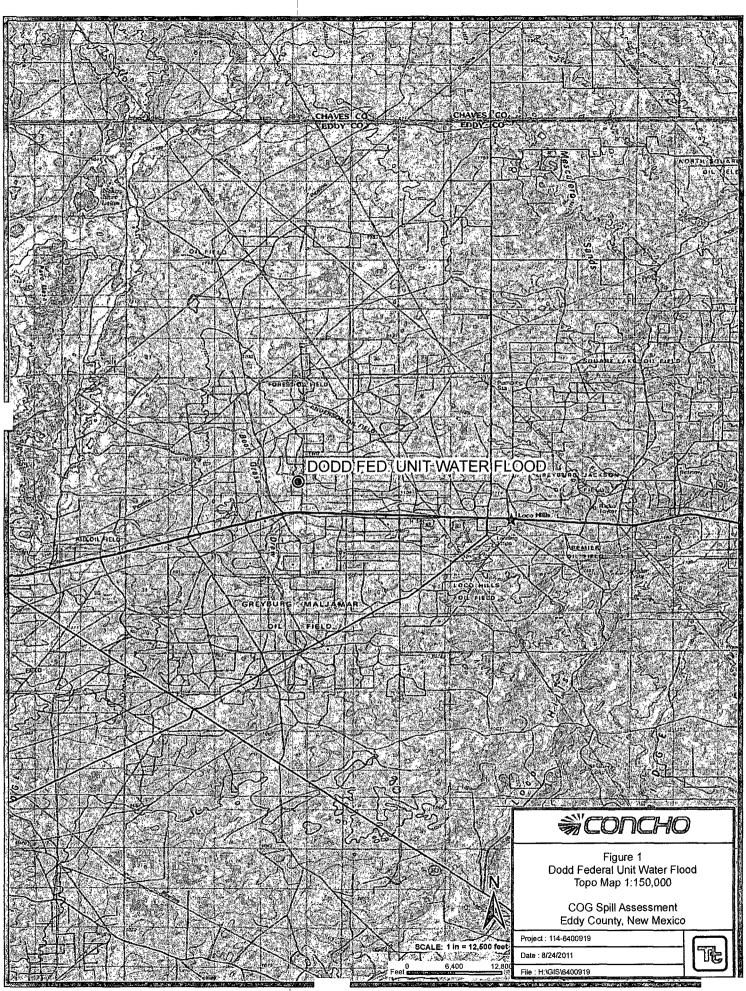
lke Tavarez. PG

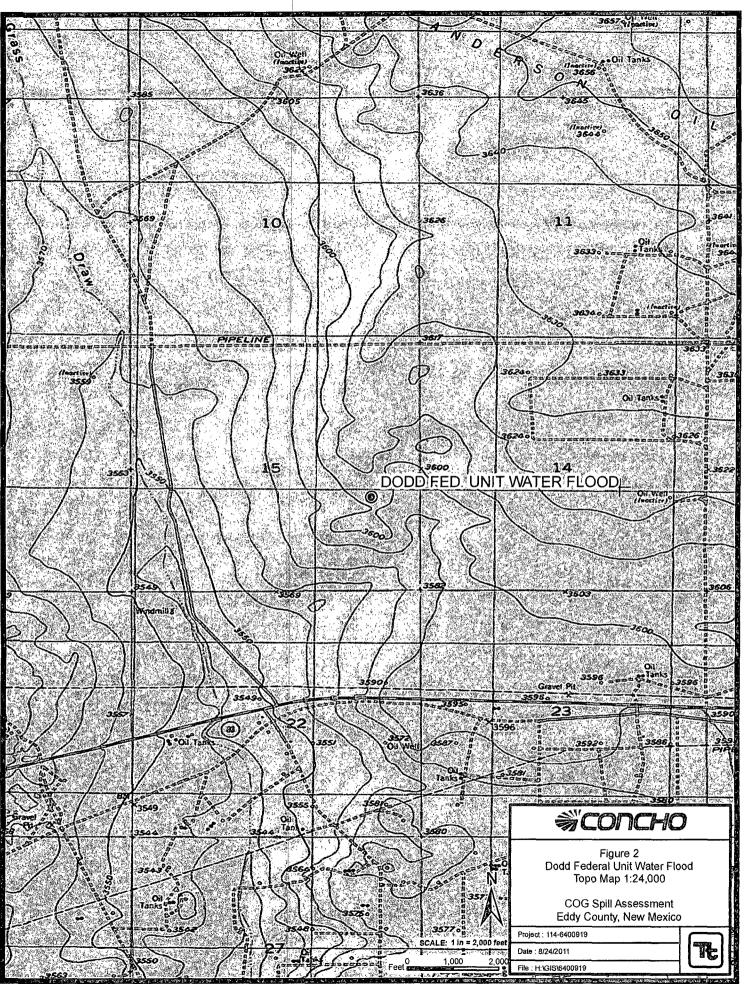
Senior Project Manager

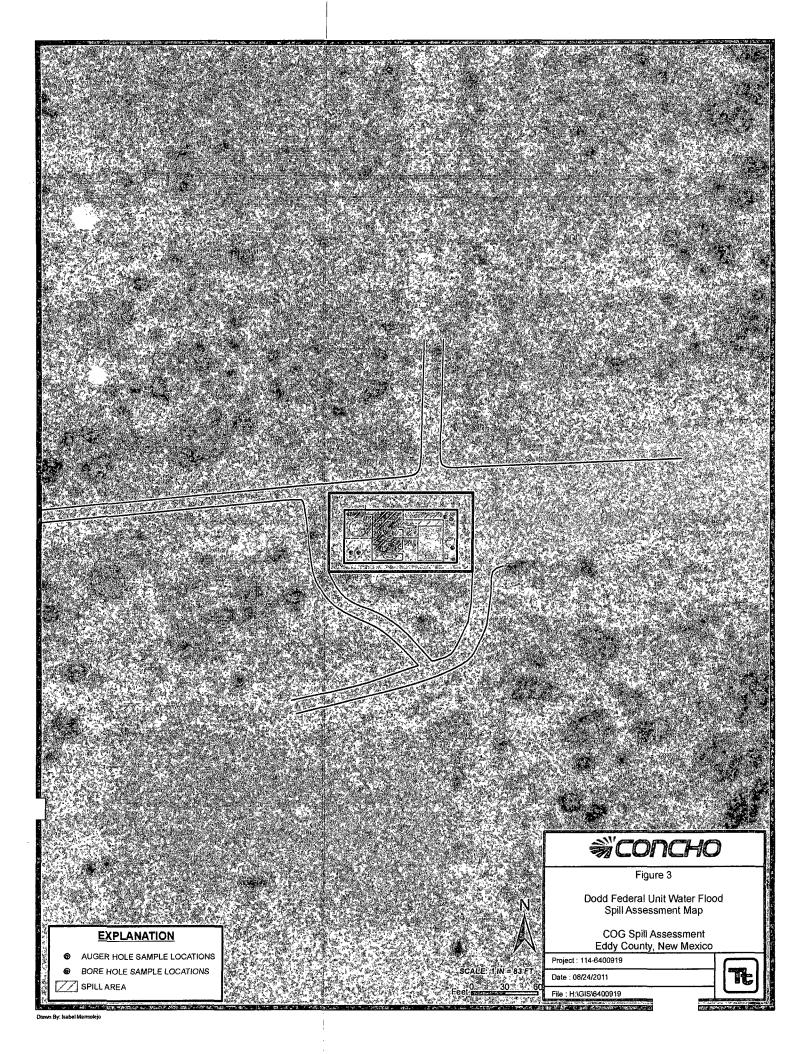
cc: Pat Ellis - COG

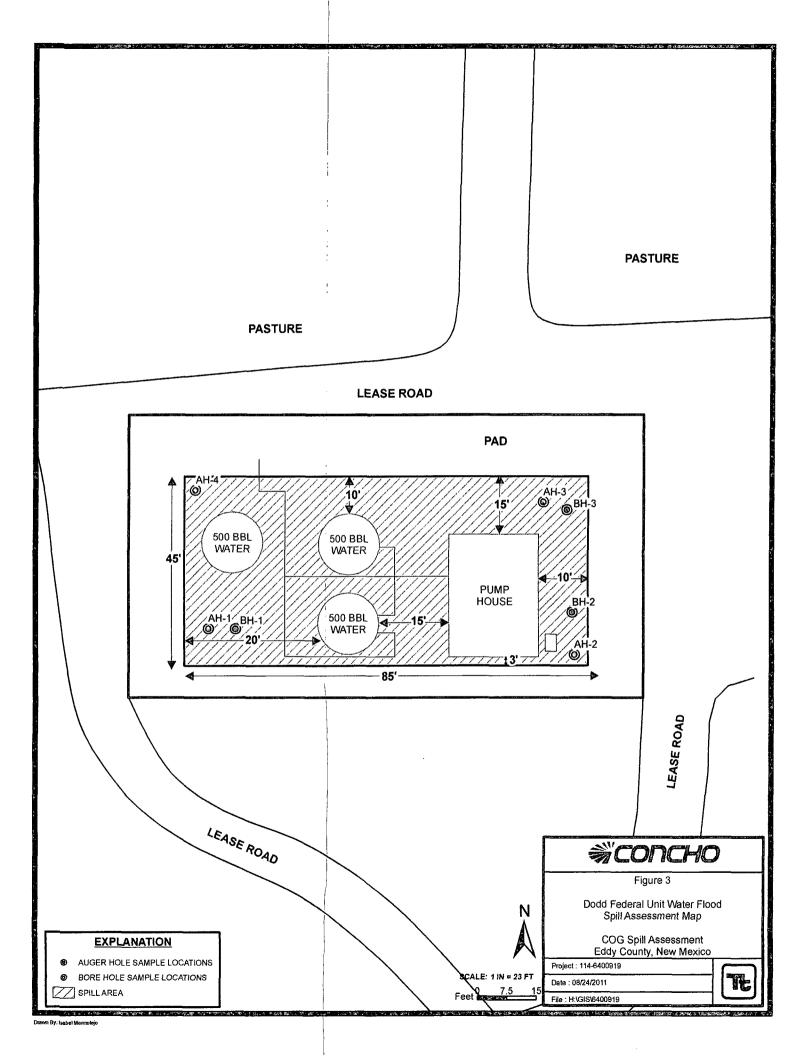
cc: Terry Gregston - BLM

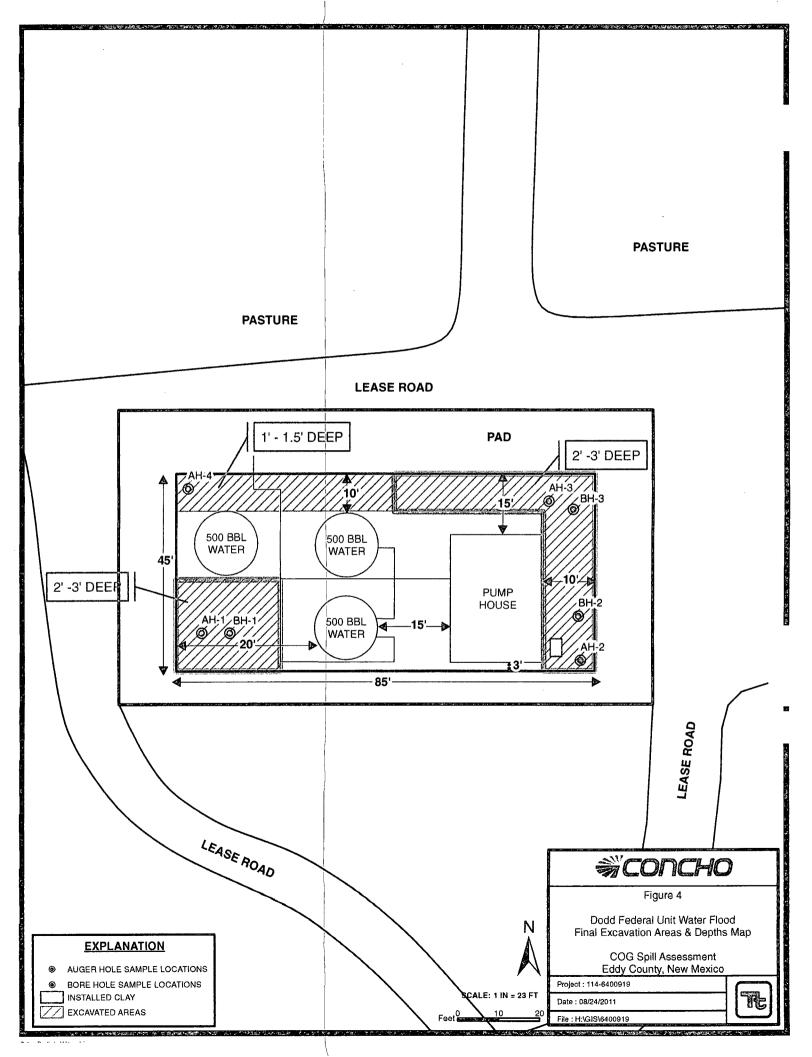
## **FIGURES**











## TABLES

	Sample	Sample	Soil	Status	Т	PH (mg/l	(g)	Benzene	Toluene	Ethlybenzene	Xylene	
Sample ID	Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
AH-1	5/31/2011	0-1/		. X .	77.2	61.9	139.10	<0.0200	0.192	0.147	4 0.492	8,190
	11	1:1:5		X								9,490
	II	1.5-2	Sin a	X							Exercit.	10,100
BH-1	9/23/2011	<u></u>		X					Land Sales and Andrew of the Sales			3,570≝
	II	3										3,650
}	11	5'	Х		_	-	_	-	-	_	-	6,140
	u	7'	Х		-	-	_	-	-	_	-	3,110
	В	10'	Х		-	-	-	-	_	-	_	3,640
·	П	15'	Х		-	-	-	-	-	-	-	2,780
	11	20'	Х		-	-	-	_	-	_	-	2,170
<u> </u>	11	25'	Х		-	-	-	-	-	-	-	4,910
	11	30'	Х		-	-	-	_	-	-	-	1,150
	11	40'	Х		-	-	-	-	-	-	-	952
	11	50'	Х		-	-	-	-	<u>-</u>	-	_	849
	11	60'	Χ		-	-	-	-	_	_	-	<200
CS-11 Sidewall	4/2/2012	-	Х				-	-	-	-	-	15,200
CS-12 Sidewall	u	-	Х		-	-	-	-	-	-	-	24,600
CS-13 Sidewall	4/3/2012		Х		-	_	-	-	-	_	<del>-</del>	<200
CS-14 Sidewall	II.	-	Х		-	-	-	-	-	_	-	<200

Comple ID	Sample	Sample	Soil	Status	T	PH (mg/l	(g)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
Sample ID	Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-2	5/31/2011	« 0-1'-»		<b>X</b> X	्रें 11.3·	<50.0	11.3	<0.0200	<0.0200	<0.0200	<0.0200	9,540
	ìı	S 1-1:54		X	A STAN							1,570
	11	2-2.5		X								2,640
	ti	3-3.5		X								4,590
	· · · · · · · · · · · · · · · · · · ·	4-4.5'	Χ		-	<u>-</u>			· <b>-</b> ·			2,430-
	Ti .	5-5.5'	Х		-	-	-	-	-	-	-	1,800
	u	6-6.5'	Х		-	-	-	-	-	-	-	2,140
	n	7-7.5'	Х		-	-	-	-	-	-	-	2,580
	11	8-8.5'	Х		-	-	-	-	-	-	-	2,060
	n	9-9.5'	Х		-	-	_	-	-			1,560
BH-2	9/23/2011	0-1"		- X								v5,150°
	Ħ	3! 👫		X					i e ja			<b>7,250</b>
	tı	5'	Х		_	-	-	-	-	-	-	1,410
	I)	7'	Х		-	-	-	-	-	-	-	4,510
	11	10'	Х		-	-	-	-	-	-	-	1,920
	n	15'	Х		-	-	-	-	-	-	-	1,490
	lt.	20'	Х		-	-	-	-	-	-	-	1,490
	u	25'	Х		-	-	-	-	-	-	-	1,050
	u	30'	Х		-	-	-	_	-		-	236
	ti.	40'	X		_	-	-	-	-	_	-	<200
	и	50'	Х		-	-	-	-	-	-	-	<200
	п	60'	Х				-	-	-	-	-	<200
CS-8 Sidewall	4/3/2012	-	Х	<u> </u>	-	<u> </u>	_	-	-	_	<u> </u>	585
CS-9 Sidewall	4/2/2012	-	Х		-	-	-	-	-	-	-	7,450
CS-10 Sidewall	"	-	Х		-	-	-	-	-	-	-	604

Commiss ID	Sample	Sample	Soil	Status	Τ	PH (mg/k	(g)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
Sample ID	Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-3	5/31/2011	.° 0-1'		X	3.14	<50.0	3.14	<0.0200	<0.0200	<0.0200 €	€0.0200	្សី,370 ្
	II	1-1.5		, X								865
	u	2-2.5		X							N. 12 S.	<i>-</i> 1,,050
		· 3-3.5'		X								2,070
	ıı	4-4.5'	Χ		-	-		-	-	-	-	1,840
	11	5-5.5'	Х		-	-		-	-	-	-	1,560
	11	6-6.5'	Х		-	-	-	-	-	-	-	1,440
	11	7-7.5'	Х		-	-	-	-	-	-	<u>-</u>	1,630
	11	8-8.5'	Х		-	-	-	-	-	-	-	4,920
	18	9-9.5'	X		-	-	-	-	-	-	-	2,060
BH-3	9/23/2011	10'	Х		-	-	_	-	_	-	-	1,900
	и	15'	Х		-	-	-	-	-		-	3,730
	14	20'	Х		-	-	-	-	-	-	-	2,740
	II	25'	Х		-	-	-	-	-	-	-	1,160
	п	30'	Х		-	-	-	-	-	-	-	203
	H	40'	Х			-	-	-	-	-	-	<200
	11	50'	Х		-	-	-	-		-		<200
	11	60'	X		-	_	-	-		~	_	<200
CS-4 Sidewall	4/2/2012	T	Х	I	Γ _	_	I _	Γ -	T		T -	546
CS-5 Sidewall	4/2/2012		X		-	-			-			565
CS-6 Sidewall	 		X		<del>-</del>			-	<del>-</del>		<u> </u>	682
CS-7 Sidewall	11		X				-	<u> </u>		-		26,500
OS-1 Sidewall	L										l	20,500

	Sample	Sample	Soil	Status	Т	PH (mg/l	kg)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride (mg/kg)
Sample ID	Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
AH-4	5/31/2011	<b>1.0-1</b> 5.5		X	22.5	<50.0	-22.5	<0.0200	<0.0200	<0.0200	<b>.</b> 0.0200	5,280
	и	1-1.5		X							<b>能</b> 。在3.0000	3,990
	II	2-2.5'	Х		-	-	-	-	-	_	-	237
CS-1 Sidewall	_4/3/2012		X .									<200
CS-2 Sidewall	II	-	Х		-	-	-	<u>.</u>	_	-	_	<200
CS-3 Sidewall	4/2/2012	-	Χ		-	-	-	-	_	-	-	14,300
Background	5/31/2011	1-1.5'	Х		-	-	_	-	-	-	-	<200
	11	3-3.5'	Х		-	-		-	-	-	-	989

(--)

Not Analyzed

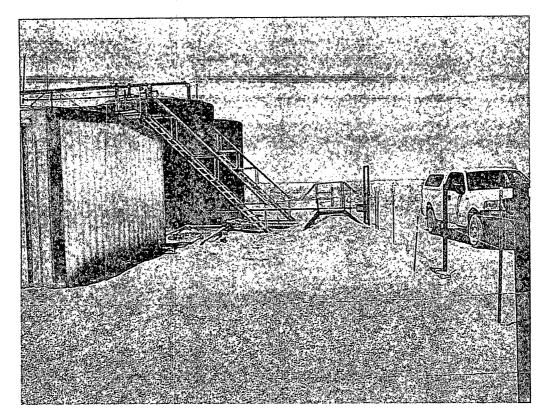


**Excavated Depths** 

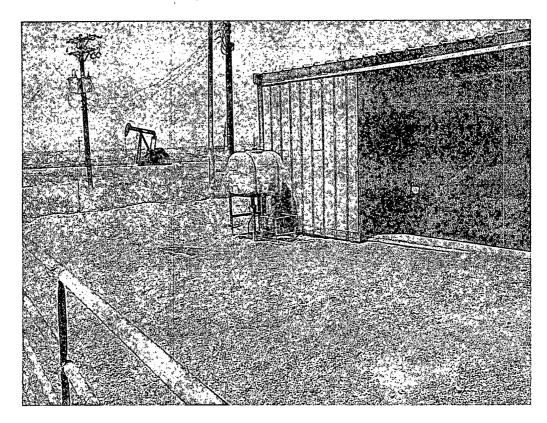
Clay Material

## **PHOTOGRAPHS**



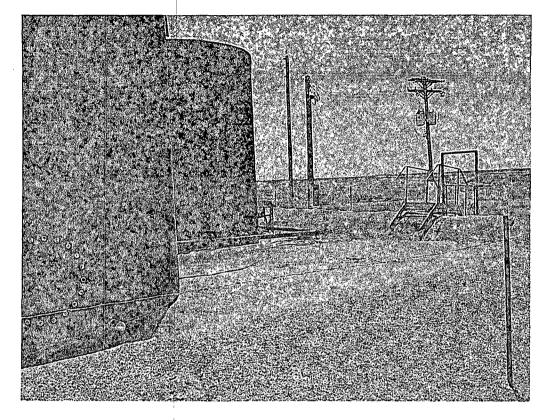


View West - AH-3 and 4

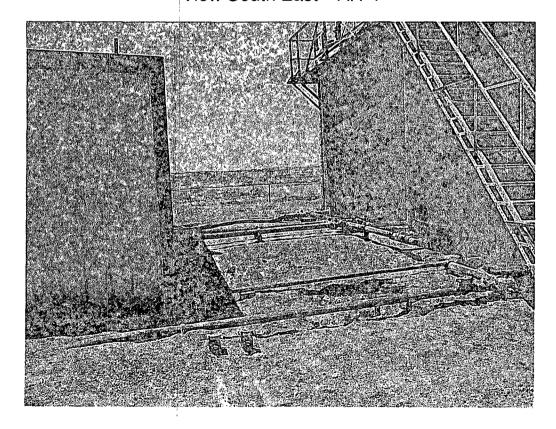


View South - AH-2



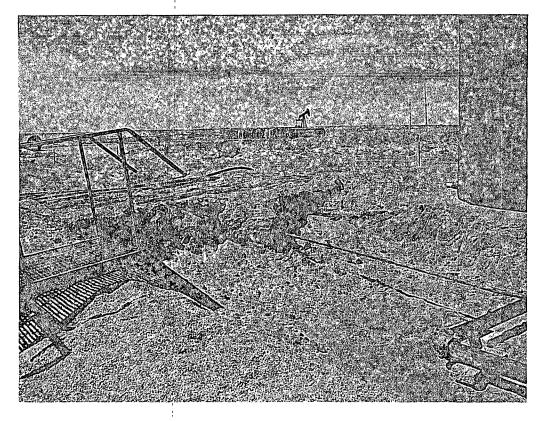


View South East - AH-4

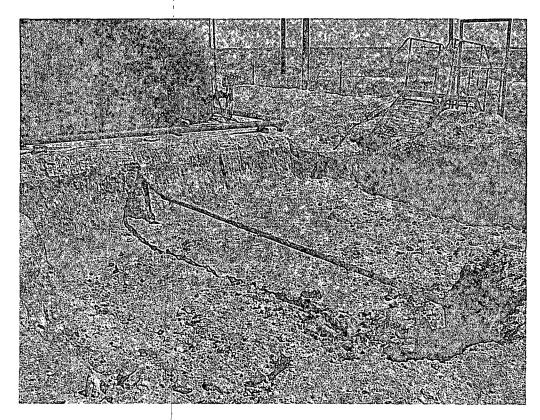


View South



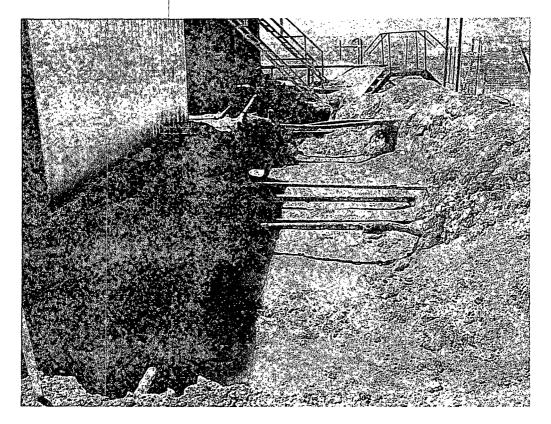


Excavated area near BH-1

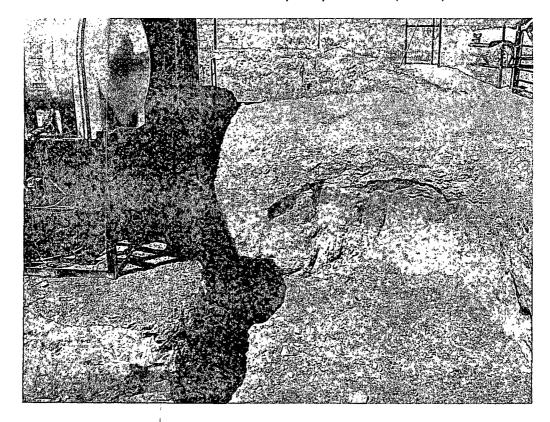


Excavated area near BH-1





Excavated area near pump house (BH-3)



Excavated area near pump house (BH-2)

### APPENDIX A

District I
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

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-141 Revised October 10, 2003

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

### Release Notification and Corrective Action

							OPERAT			Initial Rep	ort	
Name of Cor							Contact Pat					
Address 550					79701			No. (432) 230-0				
Facility Nan	e Dodd I	Federal Unit	Water Fl	ood		]	Facility Typ	e Water Floor	d TB			
Surface Own	er Feder			Mine	eral Owner					Lease No. 30-015-02987		
Surface Owi	ici Tederi	41		IVIIIC	141 0	WIICI				2030 110. 3	0-015-0	2701
				L(	<b>DCA</b>	TION	OF REI	LEASE				
Unit Letter	Section	Township	Range	Feet from	the North/South Line Feet from the East/					Line	(	County
Ī	15	17-S	29-E									Eddy
I								111 101 0700		<del></del>	****	
			l	atitude N	32.8	33275°	Longitud	e W 104.05684	μ,			
				N	JAT	URE	OF RELI	EASE				
Type of Relea	se:						Volume of		Vol	ume Recove	ered	
Produced water							120 bbls		1	bbls		
Source of Rele	ease				1		Date and H	our of Occurrence	e Dat	e and Hour	of Disco	very
Produced wa	Produced water overflow tank						5/6/2011		5/6/	2011 8:00	am	
Was Immedia	te Notice C				T		If YES, To					
		$\boxtimes$	Yes	No 🔲 N	ot Re	quired		cher - OCD				
							Jim Amos					
D. Whom? I	ach Dugae							gston - BLM our 5/9/2011 7:	52 nm			
By Whom? J		hed?			<u> </u>			lume Impacting t		rce		
Was a Watercourse Reached?  ☐ Yes ☒ No							N/A	nume impacting t	ne watercou	136.		
If a Watercoun	se was Imp	pacted, Descri	be Fully.*								•	
N/A												
IV/A					l							
Describe Caus	e of Proble	em and Remed	lial Action	Taken.*				***************************************		<del></del>		
A hole develo	ped in the s	side of an over	rflow tank	at the Dodd	Fede	ral Wate	er Flood TB.	The tank has bee	n removed a	nd replaced.		
Donalla A	A 66 d -	d Classics A	T-l-	*								
Describe Area	Affected	ind Cleanup A	action Tak	en.*								
Tetra Tech ins	nected site	and collected	samples t	o define spi	lls ext	ent Soi	l with elevate	d chloride concer	itrations was	removed at	nd haule	d away to
								clean backfill mat				
submitted to N					•					• •		•
							******					
								knowledge and u				
								d perform correct				
								arked as "Final Re on that pose a thre				
								e the operator of r				
federal, state,						- F		<b>- F</b>	<u>F</u> ,	<b>-</b>		
	//	/						OIL CONS	SERVAT	ION DIV	ISION	J
~.	/ //			<b>う</b> !								_
Signature:	-//-	4 <u> </u>	//									
Drinted Name	Hea Taylor		برسي	1	20	~ √ A	Approved by	District Superviso	or:			
Printed Name:	TVC 14AAL	L Pse	prit	Jo C		<del>`</del>						
Title: Project	Manager	•		1			Approval Date	e:	Exnir	ation Date:		
		· · · · · · · · · · · · · · · · · · ·		<del></del>		- +		-	Lampin			
E-mail Addres	s: ike.tava	rez@tetratech	.com			Conditions of Approval:						
2	-//-	-		1		Attached						
	10-1			(432) 682-4	559							
Attach Addit	onal Shee	ts It Necess:	arv									

District I
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

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Revised October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance

Form C-141

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

Attached

#### Release Notification and Corrective Action **OPERATOR** Initial Report Final Report Pat Ellis **COG OPERATING LLC** Contact Name of Company 550 W. Texas, Suite 100, Midland, TX 79701 Telephone No. 432-230-0077 Address Water Flood TB **Facility Name** Dodd Federal Unit Water Flood Facility Type Lease No. (API#) 30-015-02987 Surface Owner Federal Mineral Owner LOCATION OF RELEASE North/South Line Feet from the East/West Line Unit Letter Township Feet from the County Section Range Eddy 15 178 29E Latitude 32,83275 **Longitude 104.05684** NATURE OF RELEASE Type of Release Produced water Volume of Release 100bbls Volume Recovered 98bbls Source of Release Produced water overflow tank Date and Hour of Occurrence Date and Hour of Discovery 05/06/2011 05/06/2011 8:00 a.m. Was Immediate Notice Given? If YES, To Whom? ☑ Yes ☐ No ☐ Not Required Mike Bratcher-OCD Jim Amos-BLM Terry Gregston-BLM By Whom? Josh Russo Date and Hour 05/09/2011 7:52 p.m. Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. ☐ Yes 🖾 No If a Watercourse was Impacted, Describe Fully.\* Describe Cause of Problem and Remedial Action Taken.\* A hole developed in the side of an overflow tank at the Dodd Federal Unit Water Flood TB. The faulty tank has been removed and replaced. Describe Area Affected and Cleanup Action Taken.\* Initially 100bbls of produced water was released from the overflow tank and we were able to recover 98bbls with a vacuum truck. All released fluid was completely contained inside the dike walls of the facility. All standing fluid has been removed and the spill area has been scraped with a backhoe. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan for approval prior to any significant remediation work. 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: Josh Russo Title: **HSE** Coordinator Approval Date: **Expiration Date:** E-mail Address: jrusso@conchoresources.com Conditions of Approval:

\* Attach Additional Sheets If Necessary

Phone:

432-212-2399

05/12/2011

### APPENDIX B

# Water Well Data Average Depth to Groundwater (ft) COG - Dodd Federal Unit Water Flood Eddy County, New Mexico

	16	South	:	28 East	t		16 Sc	outh	2	9 East			16	South		30 Eas
3	5	4	3	5	1	6	5	4	3	2	1	6	5	4	3	2
,	8	9	10	11	12	7	8	9	10	11	12	7	8	Malia 9	<b>mar</b> 10	11
18	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14
	''	10	انا		13	1 10	1'	<u> </u>			15					17
9	20	21 <b>61</b>	22	23	24	19	20	21	22	23	24	19	20	21	22	23
0	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26
1	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35
	17 :	South	:	28 East		; <b></b>	17 Se	outh	2	9 East			17	South		30 Ea
	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2
	8	9	10	11	12	7	8	9	10	11	12	7	В	9	10	11
8	17	16	15	14	13	18	17	16	15 SITE	14	13	18	17	16	15	14
9	20	21	22	23	24	19	20	21	22 <b>80</b>	23	24	19	20	21	22	23
)	29	28	27	26	25	30	29 <b>210</b>	28	27	26	25	30	29	28	27	26
1	32	33	34 <b>53</b>	35	36	31	32	33	34	35 153	36	31	32	33	34	35
	404			20 =			40.0					<u> </u>				20.5
	18 3	South 4	3	28 East	1	6	18 Sc	Jutn  4	3	9 East	1	6	5	South  4	3	30 Eas
		<u> </u>											_		<u> </u>	
	8	9	10	11	12	. 7	8	9	10	11	12	7	8	9	10	11
3	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14
€	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23
)	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26
1	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35

New Mexico State Engineers Well Reports

USGS Well Reports

Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

## APPENDIX C

Report Date: June 14, 2011 Work Order: 11060239

### **Summary Report**

Ike Tavarez Tetra Tech

1910 N. Big Spring Street Midland, TX 79705

Report Date: June 14, 2011

Page Number: 1 of 5

Work Order: 11060239

Project Location: Eddy Co., NM

Project Name: COG/Dodd Federal Unit Water Flood

Project Number: 114-6400919

		1	Date	$\operatorname{Time}$	Date
Sample	Description	Matrix	Taken	Taken	Received
268053	AH-1 0-1'	soil	2011-05-31	00:00	2011-06-02
268054	AH-1 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268055	AH-1 1.5-2'	soil	2011-05-31	00:00	2011-06-02
268056	AH-2 0-1'	soil	2011-05-31	00:00	2011-06-02
268057	AH-2 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268058	AH-2 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268059	AH-2 3-3.5'	soil	2011-05-31	00:00	2011-06-02
268060	AH-2 4-4.5'	soil	2011-05-31	00:00	2011-06-02
268061	AH-2 5-5.5'	soil	2011-05-31	00:00	2011-06-02
268062	AH-2 6-6.5'	soil	2011-05-31	00:00	2011-06-02
268063	AH-2 7-7.5'	soil	2011-05-31	00:00	2011-06-02
268064	AH-2 8-8.5'	soil	2011-05-31	00:00	2011-06-02
268065	AH-2 9-9.5'	soil	2011-05-31	00:00	2011-06-02
268066	AH-3 0-1'	soil	2011-05-31	00:00	2011-06-02
268067	AH-3 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268068	AH-3 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268069	AH-3 3-3.5'	soil	2011-05-31	00:00	2011-06-02
268070	AH-3 4-4.5'	soil	2011-05-31	00:00	2011-06-02
268071	AH-3 5-5.5'	soil	2011-05-31	00:00	2011-06-02
268072	AH-3 6-6.5'	soil	2011-05-31	00:00	2011-06-02
268073	AH-3 7-7.5'	soil	2011-05-31	00:00	2011-06-02
268074	AH-3 8-8.5'	soil	2011-05-31	00:00	2011-06-02
268075	AH-3 9-9.5'	soil	2011-05-31	00:00	2011-06-02
268076	AH-4 0-1'	soil	2011-05-31	00:00	2011-06-02
268077	AH-4 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268078	AH-4 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268079	Background 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268080	Background 3-3.5'	soil	2011-05-31	00:00	2011-06-02

Report Date: June 14, 2011 Work Order: 11060239 Page Number: 2 of 5

			BTEX		TPH DRO - NEW	TPH GRO
	Benzene	$\operatorname{Toluene}$	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(ing/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(ing/Kg)	(mg/Kg)
268053 - AH-1 0-1'	< 0.0200	0.192	0.147	0.492	61.9	77.2
268056 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	11.3
268066 - AH-3 0-1'	<0.0200	< 0.0200	< 0.0200	<0.0200	<50.0	3.14
268076 - AH-4 0-1'	< 0.0200	<0.0200	< 0.0200	0.374	<50.0	22.5
		; !				
Sample: 268053 - A	H-1 0-1'	!				
Param	Flag		Result		Units	RL
Chloride			8190		mg/Kg	4
		1				
Co	TT 1 1 1 E)					
Sample: 268054 - A	.H-1 1-1.5	1				
Param	Flag	1	Result		Units	RL
Chloride			9490		mg/Kg	4
		!				
Sample: 268055 - A	H-1 1.5-2'	ŀ				
Param	Flag	1	Result		Units	RL
Chloride			10100		mg/Kg	4
		,				
Sample: 268056 - A	.Н-2 0-1'	•				
Param	Flag		Result		.Units	RL
Chloride			9540		mg/Kg	4
Sample: 268057 - A	Н-2 1-1.5					
_		1			** .	n.r.
Param	Flag		Result		Units	RL

Sample: 268058 - AH-2 2-2.5'

 Param
 Flag
 Result
 Units
 RL

 Chloride
 2640
 mg/Kg
 4

Sample: 268059 - AH-2 3-3.5'

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: June	14, 2011	Work Order: 11060239	Page 1	Number: 3 of 5
Param	Flag	Result	Units	RL
Chloride		4590	mg/Kg	4
Sample: 268060 -	AH-2 4-4.5'			
Param	Flag	Result	Units	RL
Chloride	- 100	2430	mg/Kg	4
Sample: 268061 -	AH-2 5-5.5'			
Param	Flag	Result	Units	RL
Chloride		1800	ıng/Kg	4
Sample: 268062 -	AH-2 6-6.5'	<u>:</u>		
Param	Flag	Result	Units	RL
Chloride		2140	mg/Kg	4
Sample: 268063 -	AH-2 7-7.5			
Param	Flag	Result	Units	RL
Chloride		2580	mg/Kg	4
Sample: 268064 -	AH-2 8-8.5'			
Param	Flag	Result	Units	RL
Chloride		2060	mg/Kg	4
Sample: 268065 -	AH-2 9-9.5'			
Param	Flag	Result	Units	RL
Chloride		1560	mg/Kg	4
Sample: 268066 -	AH-3 0-1'			
Param	Flag	Result	Units	RL
Chloride		1370	mg/Kg	4

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: June 14	4, 2011	Work Order: 11060239	Page I	Number: 4 of 5
Sample: 268067 - 2	AH-3 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		865	mg/Kg	4
Sample: 268068 - 4	AH-3 2-2.5'			
Param	Flag	Result	Units	RL
Chloride		1050	mg/Kg	4
Sample: 268069 - 2	AH-3 3-3.5'			
Param	Flag	Result	Units	RL
Chloride		2070	mg/Kg	4
Sample: 268070 - A	AH-3 4-4.5'			
Param	$\operatorname{Flag}$	Result	Units	RL
Chloride		1840	mg/Kg	4
Sample: 268071 - A	AH-3 5-5.5'	: :		
Param	Flag	Result	Units	RL
Chloride		. 1560	mg/Kg	4
Sample: 268072 - A	AH-3 6-6.5'	!		
Param	Flag	Result	Units	RL
Chloride		1440	mg/Kg	4
Sample: 268073 - A	AH-3 7-7.5'	i		
Param	Flag	Result	Units	RL
Chloride		1630	mg/Kg	4
Sample: 268074 - A	AH-3 8-8.5'	:		
Param	Flag	Result	Units	RL
Chloride		4920	mg/Kg	4

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: June 14, 2011		Work Order: 11060239 Page Numbe		
Sample: 268075	- AH-3 9-9.5'			
Param	Flag	Result	Units	RL
Chloride		2060	mg/Kg	4
Sample: 268076	- AH-4 0-1'			
Param	Flag	Result	Units	RL
Chloride		5280	mg/Kg	4
Sample: 268077	- AH-4 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		3990	mg/Kg	4
Sample: 268078	- AH-4 2-2.5'			
Param	Flag	Result	Units	RL
Chloride		237	mg/Kg	4
Sample: 268079	- Background 1-1.5'			
Param	Flag	Result	Units	RL
Chloride	:	<200	mg/Kg	4
Sample: 268080	- Background 3-3.5			
Param	Flag	Result	Units	RL
Chloride		989	mg/Kg	4



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E

5002 Basin Street, Suite A1 6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

Lubbock, Texas 79424 El Paso, Texas 79922

888 • 588 • 3443 Midland, Texas 79703

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

NELAP DoD LELAP WBEHUB NCTRCA DBEKansas Oklahoma ISO 17025

### Analytical and Quality Control Report

Ike Tavarez

Tetra Tech

1910 N. Big Spring Street Midland, TX, 79705

Report Date:

June 14, 2011

Work Order:

11060239

Project Location: Eddy Co., NM

COG/Dodd Federal Unit Water Flood Project Name:

Project Number: 114-6400919

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
268053	AH-1 0-1'	soil	2011-05-31	00:00	2011-06-02
268054	AH-1 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268055	AH-1 1.5-2'	soil	2011-05-31	00:00	2011-06-02
268056	AH-2 0-1'	soil	2011-05-31	00:00	2011-06-02
268057	AH-2 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268058	AH-2 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268059	AH-2 3-3.5'	soil	2011-05-31	00:00	2011-06-02
268060	AH-2 4-4.5'	soil	2011-05-31	00:00	2011-06-02
268061	AH-2 5-5.5'	soil	2011-05-31	00:00	2011-06-02
268062	AH-2 6-6.5'	soil	2011-05-31	00:00	2011-06-02
268063	AH-2 7-7.5'	soil	2011-05-31	00:00	2011-06-02
268064	AH-2 8-8.5'	soil	2011-05-31	00:00	2011-06-02
268065	AH-2 9-9.5'	soil	2011-05-31	00:00	2011-06-02
268066	AH-3 0-1'	soil	2011-05-31	00:00	2011-06-02
268067	AH-3 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268068	AH-3 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268069	AH-3 3-3.5'	soil	2011-05-31	00:00	2011-06-02
268070	AH-3 4-4.5'	soil	2011-05-31	00:00	2011-06-02

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
268071	AH-3 5-5.5'	soil	2011-05-31	00:00	2011-06-02
268072	AH-3 6-6.5'	soil	2011-05-31	00:00	2011-06-02
268073	AH-3 7-7.5'	soil	2011-05-31	00:00	2011-06-02
268074	AH-3 8-8.5'	soil	2011-05-31	00:00	2011-06-02
268075	AH-3 9-9.5'	soil	2011-05-31	00:00	2011-06-02
268076	AH-4 0-1'	soil	2011-05-31	00:00	2011-06-02
268077	AH-4 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268078	AH-4 2-2.5'	soil	2011-05-31	00:00	2011-06-02
268079	Background 1-1.5'	soil	2011-05-31	00:00	2011-06-02
268080	Background 3-3.5'	soil	2011-05-31	00:00	2011-06-02

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 33 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

# Report Contents

Case Narrative	i	5
Analytical Report		6
Sample 268053 (AH-1 0-1')	·	6
	p	7
		7
Sample 268056 (AH-2 0-1')	 	8
	· · · · · · · · · · · · · · · · · · ·	9
	1 4	9
		10
		10
		10
		11
- , , , ,		 11
		11
• ,		11
		$\frac{11}{12}$
		$\frac{12}{13}$
* ,		$\frac{13}{13}$
		$\frac{13}{14}$
		14 14
		14 14
		$\frac{14}{15}$
		15 15
		15
		15
		16
		17
		17
		18
Sample 268080 (Background 3-3.5')	ý	18
Method Blanks	; -	
		19
		19
		19
		19
		20
QC Batch 82023 - Method Blank (1)		20
		20
QC Batch 82163 - Method Blank (1)	}	20
Laboratory Control Spikes		22
		22 22
		22
		23
QC Batch 82022 - LCS (1)	1	$^{23}$

QC Batch 82023 - LCS (1)	 $\dots$ 24
QC Batch 82132 - LCS (1)	 24
QC Batch 82163 - LCS (1)	 25
QC Batch 81910 - MS (1)	 25
QC Batch 81911 - MS (1)	 20
QC Batch 82021 - MS (1)	 20
QC Batch 82022 - MS (1)	 26
QC Batch 82023 - MS (1)	 27
QC Batch 82132 - MS (1)	 27
QC Batch 82163 - MS (1)	 28
Calibration Standards	29
QC Batch 82022 - ICV (1)	 30
QC Batch 82022 - CCV (1)	 30
QC Batch 82023 - ICV (1)	 31
QC Batch 82023 - CCV (1)	 31
QC Batch 82132 - CCV (2)	 31
QC Batch 82132 - CCV (3)	 31
QC Batch 82163 - ICV (1)	 32
QC Batch 82163 - CCV (1)	 32
Appendix	33
<u> </u>	
Attachments	 33

### Case Narrative

Samples for project COG/Dodd Federal Unit Water Flood were received by TraceAnalysis, Inc. on 2011-06-02 and assigned to work order 11060239. Samples for work order 11060239 were received intact at a temperature of 3.7 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	69547	2011-06-03 at 08:52	81910	2011-06-03 at 08:52
Chloride (Titration)	SM 4500-Cl B	69605	2011-06-07 at 09:06	82021	2011-06-08 at 14:56
Chloride (Titration)	SM 4500-Cl B	69605	2011-06-07 at 09:06	82022	2011-06-08 at 14:56
Chloride (Titration)	SM 4500-Cl B	69605	2011-06-07 at 09:06	82023	2011-06-08 at 14:57
Chloride (Titration)	SM 4500-Cl B	69605	2011-06-07 at 09:06	82163	2011-06-13 at 15:26
TPH DRO - NEW	S 8015 D	69730	2011-06-10 at 15:00	82132	2011-06-10 at 16:00
TPH GRO	S 8015 D	69547	2011-06-03 at 08:52	81911	2011-06-03 at 08:52

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 11060239 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.

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 6 of 33 Eddy Co., NM

# **Analytical Report**

Sample: 268053 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 81910 Prep Batch: 69547

Analytical Method: S 8021B Date Analyzed: 2011-06-03 Sample Preparation: 2011-06-03 Prep Method: S 5035 Analyzed By: ME Prepared By: ME

			$\operatorname{RL}$			
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	RL
Benzene		2	< 0.0200	mg/Kg	1	0.0200
Toluene		2	$\boldsymbol{0.192}$	m mg/Kg	1	0.0200
Ethylbenzene		. 2	0.147	m mg/Kg	1	0.0200
Xylene		2	0.492	mg/Kg	1	0.0200

						$_{ m Spike}$	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	:		1.68	mg/Kg	1	2.00	84	52.8 - 137
4-Bromofluorobenzene (4-BFB)			1.82	mg/Kg	1	2.00	91	38.4 - 157

Sample: 268053 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 82021 Prep Batch: 69605 Analytical Method: SM 4500-Cl B Date Analyzed: 2011-06-08 Sample Preparation: 2011-06-07

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

		1	RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride		!	8190	mg/Kg	100	4.00

Sample: 268053 - AH-1 0-1'

Laboratory: Lubbock

Analysis: TPH DRO - NEW
QC Batch: 82132
Prep Batch: 69730

Analytical Method: S 8015 D
Date Analyzed: 2011-06-10
Sample Preparation: 2011-06-10

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

		r F	RL			
Parameter	Flag	Cert	Result	Units	Dilution	R.L
DRO		1	61.9	mg/Kg	1	50.0

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 7 of 33 Eddy Co., NM

			i			Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			119	mg/Kg	1	100	119	70 - 130
G 1. 0000F0	ATT 1 0 1	•						

Sample: 268053 - AH-1 0-1

Laboratory:

Midland

TPH GRO Analysis: 81911

Analytical Method:

S 8015 D

Prep Method: S 5035

QC Batch: Prep Batch: 69547

Date Analyzed: Sample Preparation: 2011-06-03

2011-06-03

Analyzed By:

104

MEPrepared By: ME

42 - 159

				RL				
Parameter	Flag	$\operatorname{Cert}$		Result	$_{ m Un}$	its	Dilution	RL
GRO		. 2		77.2	mg/Kg		1	2.00
						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			1.99	mg/Kg	1	2.00	100	48.5 - 152

2.09

mg/Kg

Sample: 268054 - AH-1 1-1.5'

69605

4-Bromofluorobenzene (4-BFB)

Laboratory:

Prep Batch:

Midland

Analysis: Chloride (Titration) QC Batch: 82021

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2011-06-08

2011-06-07

1

2.00

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

RLCert Result Units Dilution RLParameter Flag Chloride 9490 mg/Kg 100 4.00

Sample: 268055 - AH-1 1.5-2'

Laboratory:

Midland

Analysis: QC Batch:

Prep Batch:

Chloride (Titration)

82022 69605

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-06-08

2011-06-07

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

continued ...

Report Date:	June	14,	2011
114-6400919			

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 8 of 33 Eddy Co., NM

sample 268055 cc	mtinued .	
------------------	-----------	--

			R.L			
Parameter	Flag	Cert	Result	Units	Dilution	RL
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			10100	mg/Kg	100	4.00

### Sample: 268056 - AH-2 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 81910 Prep Batch: 69547

Analytical Method: S 8021B Date Analyzed: 2011-06-03 Sample Preparation: 2011-06-03 Prep Method: S 5035 Analyzed By: ME Prepared By: ME

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene		2	< 0.0200	mg/Kg	1	0.0200
Toluene		2	< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		2	< 0.0200	mg/Kg	1	0.0200
Xylene		2	< 0.0200	mg/Kg	1	0.0200

						Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	${f Amount}$	Recovery	$\operatorname{Limits}$
Triffuorotoluene (TFT)			1.99	mg/Kg	1	2.00	100	52.8 - 137
4-Bromofluorobenzene (4-BFB)			1.90	mg/Kg	1	2.00	95	38.4 - 157

## Sample: 268056 - AH-2 0-1'

Laboratory: Midland

Prep Batch:

Analysis: Chloride (Titration) QC Batch: 82022 69605

Analytical Method: Date Analyzed: Sample Preparation: 2011-06-07

SM 4500-Cl B 2011-06-08

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

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			9540	mg/Kg	100	4.00

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 9 of 33 Eddy Co., NM

Sample: 268056 - AH-2 0-1'

Laboratory: Lubbock

Analysis: TPH DRO - NEW

QC Batch: 82132 Prep Batch: 69730 Analytical Method:

S 8015 D Date Analyzed: 2011-06-10 Sample Preparation: 2011-06-10

Prep Method: N/A

Analyzed By: CMPrepared By: CM

RL

Parameter Flag Cert Result Units Dilution RLDRO <50.0 mg/Kg 50.0

						$\mathbf{Spike}$	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			116	mg/Kg	1	100	116	70 - 130

Sample: 268056 - AH-2 0-1'

Laboratory: Midland

TPH GRO Analysis: QC Batch: 81911 Prep Batch: 69547

Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D 2011-06-03 2011-06-03 Prep Method: S 5035Analyzed By: ME

Prepared By: ME

RLFlag Cert Result Units Dilution RLParameter GRO 11.3 mg/Kg 2.00 1 2

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.35	mg/Kg	1	2.00	118	48.5 - 152
4-Bromofluorobenzene (4-BFB)			2.67	mg/Kg	1	2.00	134	42 - 159

Sample: 268057 - AH-2 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 82022 Prep Batch: 69605

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2011-06-08 2011-06-07

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

RLParameter Flag Cert Result Units Dilution RL4.00 Chloride 1570 mg/Kg 100

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 10 of 33 Eddy Co., NM

Sample: 268058 - AH-2 2-2.5'

Laboratory: Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

82022 69605

Date Analyzed: Sample Preparation:

Cert

2011-06-08 2011-06-07 Analyzed By: ARPrepared By: AR.

RL

Parameter Chloride

Flag

Result 2640

Units mg/Kg Dilution 100

RL4.00

Sample: 268059 - AH-2 3-3.5'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 82022 Prep Batch: 69605

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-06-08

2011-06-07

Prep Method: N/A

Analyzed By: AR

Sample Preparation:

Prepared By: AR.

RL

Cert Result Parameter Flag 4590 Chloride

Units mg/Kg Dilution RL100 4.00

Sample: 268060 - AH-2 4-4.5'

Laboratory:

Midland

Analysis: QC Batch: 82022

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-06-08

Prep Method: N/A Analyzed By: AR

Prep Batch:

69605

Sample Preparation:

2011-06-07

Prepared By:

Flag Cert

RLResult

Parameter Chloride

2430

Units mg/Kg

Dilution

100

RL4.00

Sample: 268061 - AH-2 5-5.5'

Laboratory:

Midland

Analysis:

82022

Chloride (Titration) Analytical Method:

Date Analyzed:

SM 4500-Cl B

Prep Method: N/A AR. AR

QC Batch: Prep Batch: 69605

Sample Preparation:

2011-06-08 2011-06-07 Analyzed By: Prepared By:

Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood RLUnits Dilution RLParameter Flag Cert Result Chloride 1800 100 4.00 mg/Kg Sample: 268062 - AH-2 6-6.5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: Analyzed By: 82022 Date Analyzed: 2011-06-08 ARPrep Batch: 69605 Sample Preparation: 2011-06-07 Prepared By: AR RLParameter Flag  $\operatorname{Cert}$ Result Units Dilution RLChloride 2140 mg/Kg 100 4.00 Sample: 268063 - AH-2 7-7.5' Laboratory: Midland Analysis: Prep Method: N/A Chloride (Titration) Analytical Method: SM 4500-Cl B QC Batch: 82022 Analyzed By: ARDate Analyzed: 2011-06-08 Prep Batch: 69605 Sample Preparation: 2011-06-07 Prepared By: AR RLParameter Flag Cert Result Units Dilution RL4.00 Chloride 2580 100 mg/Kg Sample: 268064 - AH-2 8-8.53 Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 82022 Date Analyzed: 2011-06-08 Analyzed By: ARPrep Batch: 69605 Sample Preparation: 2011-06-07 Prepared By: ARRLFlag Parameter Cert Dilution Result Units RLChloride 2060 100 4.00 mg/Kg

Work Order: 11060239

Report Date: June 14, 2011

Page Number: 11 of 33

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 12 of 33

Eddy Co., NM

Sample: 268065 - AH-2 9-9.5'

Laboratory:

Midland

Analysis: Chloride (Titration) Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

82023

Date Analyzed:

2011-06-08

Analyzed By: AR

Prep Batch:

69605

Sample Preparation: 2011-06-07

Prepared By: AR

RL

Dilution RLCert Result Units Parameter Flag 4.00 Chloride 1560 mg/Kg 100

Sample: 268066 - AH-3 0-1'

Laboratory:

Midland

Analysis: BTEX 81910

Analytical Method:

S 8021B

Prep Method: S 5035

QC Batch: Prep Batch:

69547

Date Analyzed: 2011-06-03 Sample Preparation: 2011-06-03

Analyzed By: Prepared By:

MEME

RI

			I.L			
Parameter	$\operatorname{Flag}$	Cert	Result	Units	Dilution	RL
Benzene		2	< 0.0200	mg/Kg	1	0.0200
Toluene		2	< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		2	< 0.0200	mg/Kg	1	0.0200
Xylene		2	< 0.0200	mg/Kg	1	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	$\mathbf{A}\mathbf{mount}$	Recovery	Limits
Trifluorotoluene (TFT)			2.11	mg/Kg	1	2.00	106	52.8 - 137
4-Bromofluorobenzene (4-BFB)			2.04	mg/Kg	1	2.00	102	38.4 - 157

Sample: 268066 - AH-3 0-1'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

82023 69605

Date Analyzed: Sample Preparation:

2011-06-08

Analyzed By: AR.

2011-06-07

Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1370	mg/Kg	100	4.00

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 13 of 33

Eddy Co., NM

Sample: 268066 - AH-3 0-1'

Laboratory: Lubbock

TPH DRO - NEW Analysis:

QC Batch: 82132 Prep Batch: 69730

Analytical Method: S 8015 D Date Analyzed:

2011-06-10

Prep Method: N/A

Sample Preparation: 2011-06-10 Analyzed By: CMPrepared By: CM

RL

Dilution Cert Result RLParameter Flag Units mg/Kg 50.0 DRO < 50.0 1

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			116	mg/Kg	1	100	116	70 - 130

Sample: 268066 - AH-3 0-1'

69547

Laboratory: Midland

Prep Batch:

TPH GRO Analysis: QC Batch: 81911

Analytical Method: Date Analyzed: Sample Preparation:

S 8015 D 2011-06-03 2011-06-03

S 5035 Prep Method: Analyzed By: ME

Prepared By:

RLDilution RLParameter Flag Cert Result Units GRO 3.14 mg/Kg 2.00 2 1

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.48	mg/Kg	1	2.00	124	48.5 - 152
4-Bromofluorobenzene (4-BFB)			2.38	mg/Kg	1	2.00	119	42 - 159

Sample: 268067 - AH-3 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 82023 Prep Batch: 69605 Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2011-06-08 2011-06-07

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

RLParameter Cert Dilution RLFlag Result Units Chloride 865 mg/Kg 100 4.00

Work Order: 11060239 Page Number: 14 of 33 Report Date: June 14, 2011 Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood Sample: 268068 - AH-3 2-2.5' Laboratory: Midland Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A Analysis: Analyzed By: AR QC Batch: 82023 Date Analyzed: 2011-06-08 Sample Preparation: 2011-06-07 Prepared By: ARPrep Batch: 69605 RLCert Dilution RLParameter Flag Result Units Chloride 1050 mg/Kg 100 4.00 Sample: 268069 - AH-3 3-3.5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A Date Analyzed: 2011-06-08 Analyzed By: QC Batch: 82023 ARPrep Batch: 69605 Sample Preparation: 2011-06-07 Prepared By: ARRLFlag Cert Result Units Dilution RLParameter 2070 100 4.00 Chloride mg/Kg Sample: 268070 - AH-3 4-4.5' Midland Laboratory: Chloride (Titration) Analysis: Analytical Method: SM 4500-Cl B Prep Method: N/A 2011-06-08 QC Batch: 82023 Date Analyzed: Analyzed By: AR

Sample:	268071		AH-3	5-5.5
---------	--------	--	------	-------

69605

Flag

Laboratory: Midland

Prep Batch:

Parameter

Chloride

Analytical Method: Analysis: Chloride (Titration) SM 4500-Cl B Prep Method: N/A QC Batch: 82023 Date Analyzed: 2011-06-08 Analyzed By: ARSample Preparation: Prep Batch: 69605 2011-06-07 Prepared By: AR

Sample Preparation:

Cert

RL

Result

1840

2011-06-07

Units

mg/Kg

Prepared By:

Dilution

100

AR

RL

4.00

Report Date 114-6400919	e: June 14, 2011	Work COG/Dodd	Corder: 1106 Federal Unit	Page Number: 15 of 33 Eddy Co., NM		
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	1 1005		1560	mg/Kg	100	4.00
Sample: 26	88072 - AH-3 6-6.5'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 82023 69605	Date Ar	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2011-06-08 2011-06-07	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Parameter	Flag	Cert	RL Result	Units mg/Kg	Dilution 100	RL
Chloride			1440			4.00
Chronice			1110	G, G		
Sample: 26	8073 - AH-3 7-7.5'		1110	G, G		
Sample: 26 Laboratory: Analysis: QC Batch:	88073 - AH-3 7-7.5' Midland Chloride (Titration) 82023 69605	Analytic Date An	al Method:	SM 4500-Cl B 2011-06-08 2011-06-07	Prep Method: Analyzed By: Prepared By:	N/A AR AR
	Midland Chloride (Titration) 82023 69605	Analytic Date An	al Method: alyzed: Preparation: RL	SM 4500-Cl B 2011-06-08 2011-06-07	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Sample: 26 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 82023	Analytic Date An Sample	:al Method: alyzed: Preparation:	SM 4500-Cl B 2011-06-08	Prep Method: Analyzed By:	N/A AR
Sample: 26 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 82023 69605	Analytic Date An Sample	al Method: alyzed: Preparation: RL Result	SM 4500-Cl B 2011-06-08 2011-06-07 Units	Prep Method: Analyzed By: Prepared By: Dilution	N/A AR AR
Sample: 26 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride  Sample: 26 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 82023 69605  Flag  8074 - AH-3 8-8.5'  Midland Chloride (Titration) 82023	Analytic Date An Sample Cert Analytic Date An	cal Method: nalyzed: Preparation: RL Result 1630 ral Method: nalyzed:	SM 4500-Cl B 2011-06-08 2011-06-07 Units mg/Kg  SM 4500-Cl B 2011-06-08	Prep Method: Analyzed By: Prepared By: Dilution 100  Prep Method: Analyzed By:	N/A AR AR AL 4.00
Sample: 26 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 82023 69605  Flag  8074 - AH-3 8-8.5'  Midland Chloride (Titration)	Analytic Date An Sample Cert Analytic Date An	cal Method: nalyzed: Preparation: RL Result 1630	SM 4500-Cl B 2011-06-08 2011-06-07 Units mg/Kg	Prep Method: Analyzed By: Prepared By: Dilution 100  Prep Method:	N/A AR AR RL 4.00

114-6400919

Work Order: 11060239

COG/Dodd Federal Unit Water Flood

Page Number: 16 of 33

Eddy Co., NM

Sample: 268075 - AH-3 9-9.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

82163 69605

Date Analyzed:

2011-06-13

Analyzed By:

AR. AR

Flag

Sample Preparation: 2011-06-07

Prepared By:

RL

Parameter Chloride

 $\operatorname{Cert}$ Result 2060

Units mg/Kg Dilution

RL100 4.00

Sample: 268076 - AH-4 0-1'

Laboratory:

Midland

Analysis: QC Batch: Prep Batch:

BTEX 81910 69547

Analytical Method: Date Analyzed:

S 8021B

2011-06-03

Prep Method: S 5035 Analyzed By:

Prepared By:

ME ME

Sample Preparation: 2011-06-03

		•	RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene		2	< 0.0200	mg/Kg	1	0.0200
Toluene		2	< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		2	< 0.0200	$_{ m mg/Kg}$	1	0.0200
Xylene		, 2	0.374	mg/Kg	1	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	1	2.00	96	52.8 - 137
4-Bromofluorobenzene (4-BFB)			1.85	mg/Kg	1	2.00	92	38.4 - 157

Sample: 268076 - AH-4 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration) 82163

Analytical Method:

SM 4500-Cl B 2011-06-13

Prep Method: N/A Analyzed By: AR

QC Batch: Prep Batch: 69605

Date Analyzed: Sample Preparation:

2011-06-07

Prepared By: AR

RL

Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			5280	mg/Kg	100	4.00

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 17 of 33

Eddy Co., NM

#### Sample: 268076 - AH-4 0-1'

Laboratory:

Lubbock

Analysis: TPH DRO - NEW QC Batch: 82132

Analytical Method:

Units

mg/Kg

S 8015 D

Prep Method: N/A Analyzed By:

CM

Prep Batch: 69730

Date Analyzed: Sample Preparation:

2011-06-10 2011-06-10

Prepared By: CM

RL

Parameter

Cert

Result

119

Result

Units

Dilution

RL

Limits

70 - 130

50.0

DRO

Flag

Cert

< 50.0

mg/Kg

Spike

Amount

100

Percent Recovery

Recovery

119

Surrogate Flag n-Tricosane

# Sample: 268076 - AH-4 0-1'

Laboratory:

Midland

Analysis: TPH GRO 81911

Analytical Method:

S 8015 D 2011-06-03

Dilution

 $\overline{1}$ 

Prep Method: S 5035 Analyzed By:

ME

QC Batch: Prep Batch:

69547

Date Analyzed: · Sample Preparation:

2011-06-03

Prepared By: ME

RL

Parameter Flag  $\operatorname{Cert}$ Result Units Dilution RLGRO 22.5 2.00 mg/Kg

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.29	mg/Kg	1	2.00	114	48.5 - 152
4-Bromofluorobenzene (4-BFB)			2.37	mg/Kg	1	2.00	118	42 - 159

#### Sample: 268077 - AH-4 1-1.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 82163 Prep Batch: 69605

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2011-06-13

2011-06-07

Prep Method: N/A Analyzed By: AR

AR.

Prepared By:

RL

Parameter Flag Cert Result Units Dilution RLChloride 3990 mg/Kg 100 4.00

Report Date: June 14, 2011 Work Order: 11060239 Page Number: 18 of 33 Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood Sample: 268078 - AH-4 2-2.5' Midland Laboratory: Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 82163 Date Analyzed: AR2011-06-13 Analyzed By: 69605 Prep Batch: Sample Preparation: 2011-06-07 Prepared By: AR RLParameter Flag Cert Result Units Dilution RLChloride 237 4.00 mg/Kg 50

Sample: 268079 - Background 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

Analytical Method: QC Batch: 82163 Date Analyzed: Prep Batch: 69605 Sample Preparation:

SM 4500-Cl B 2011-06-13 2011-06-07

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

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

Sample: 268080 - Background 3-3.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 82163 Prep Batch: 69605

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-06-13

2011-06-07

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

RLParameter Flag Cert Result Units Dilution RLChloride 989 mg/Kg 100 4.00

Sample Preparation:

114-6400919

### Work Order: 11060239 COG/Dodd Federal Unit Water Flood

Page Number: 19 of 33 Eddy Co., NM

# Method Blanks

Method Blank (1)

QC Batch: 81910

QC Batch: Prep Batch: 69547

Xylene

81910

Date Analyzed: QC Preparation:

2011-06-03 2011-06-03

< 0.00613

Analyzed By: ME

mg/Kg

Prepared By: ME

0.02

MDL Parameter Units Flag Cert Result RLBenzene mg/Kg < 0.0118 0.02 2 Toluene < 0.00600 mg/Kg 0.02Ethylbenzene mg/Kg < 0.00850 0.022

Spike Percent Recovery Surrogate Units Flag Cert Result Dilution Amount Recovery Limits 66.6 - 122 Triffuorotoluene (TFT) 1.64 mg/Kg 2.00 82 1 4-Bromofluorobenzene (4-BFB) 1.55 mg/Kg 1 2.00 78 55.4 - 124

2

Method Blank (1)

QC Batch: 81911

QC Batch: Prep Batch:

81911 69547 Date Analyzed: QC Preparation:

2011-06-03 2011-06-03

Analyzed By: ME

Prepared By: ME

MDL Parameter Flag Cert Result Units RLGRO < 0.753 mg/Kg 2

Spike Percent Recovery Surrogate Flag Cert Result Units Dilution Amount Recovery Limits Trifluorotoluene (TFT) 1.98 mg/Kg 1 2.00 99 67.6 - 150 4-Bromofluorobenzene (4-BFB) 1.72 mg/Kg 2.00 86 52.4 - 130 1

Method Blank (1)

QC Batch: 82021

QC Batch:

82021

Prep Batch: 69605 Date Analyzed:

2011-06-08

QC Preparation: 2011-06-07 Analyzed By: AR.

Prepared By: AR.

Page Number: 20 of 33 Report Date: June 14, 2011 Work Order: 11060239 Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood MDL RLParameter Flag Cert Result Units Chloride < 3.85 4 mg/Kg Method Blank (1) QC Batch: 82022 QC Batch: 82022 Analyzed By: AR. Date Analyzed: 2011-06-08 Prep Batch: 69605 Prepared By: QC Preparation: 2011-06-07 MDL Parameter Flag Cert Result Units RLChloride < 3.85 mg/Kg 4 Method Blank (1) QC Batch: 82023 QC Batch: 82023 Date Analyzed: Analyzed By: AR. 2011-06-08 Prep Batch: 69605 QC Preparation: 2011-06-07 Prepared By: AR

Cert

Flag

QC Batch: 82132 Method Blank (1)

Parameter

Chloride

QC Batch: 82132 Date Analyzed: 2011-06-10 Analyzed By: CM Prep Batch: 69730 2011-06-10 Prepared By: QC Preparation:

MDL Units RLParameter Flag Cert Result DRO < 17.1mg/Kg 50

MDL

Result

< 3.85

RL

4

CM

Units

mg/Kg

Recovery Spike Percent Limits Surrogate Flag Cert Result Units Dilution Amount Recovery 70 - 130 n-Tricosane 113 mg/Kg 1 100 113

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 21 of 33

Eddy Co., NM

Method Blank (1)

QC Batch: 82163

QC Batch: 82163 Prep Batch: 69605 Date Analyzed: QC Preparation:

2011-06-13 2011-06-07 Analyzed By: AR

Prepared By: AR

MDL

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 22 of 33 Eddy Co., NM

# Laboratory Control Spikes

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

QC Batch:

81910

Date Analyzed:

2011-06-03

Analyzed By: ME

Prep Batch: 69547

QC Preparation: 2011-06-03

Prepared By: ME

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
Benzene		2	1.93	mg/Kg	1	2.00	< 0.0118	96	81.9 - 108
Toluene		2 .	2.04	mg/Kg	1	2.00	< 0.00600	102	81.9 - 118
Ethylbenzene		2	1.72	mg/Kg	1	2.00	< 0.00850	86	78.4 - 115
Xylene		2	5.18	mg/Kg	1	6.00	< 0.00613	86	79.1 - 116

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

			LCSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	$\operatorname{Limit}$
Benzene		2	1!97	mg/Kg	1	2.00	< 0.0118	98	81.9 - 108	2	20
Toluene		2	2:09	mg/Kg	1	2.00	< 0.00600	104	81.9 - 118	2	20
Ethylbenzene		2	1.80	mg/Kg	1	2.00	< 0.00850	90	78.4 - 115	4	20
Xylene		2	5.38	mg/Kg	1	6.00	< 0.00613	90	79.1 - 116	4	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.	${f Amount}$	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.67	1.74	mg/Kg	1	2.00	84	87	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.67	1.77	mg/Kg	1	2.00	84	88	69.8 - 121

# Laboratory Control Spike (LCS-1)

QC Batch:

81911

Date Analyzed:

2011-06-03

Analyzed By: ME

Prep Batch: 69547

QC Preparation: 2011-06-03

Prepared By: ME

			LCS			Spike	Matrix		Rec.
Param	F	$\mathbf{C}_{ }^{'}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		2	14.8	mg/Kg	1	20.0	< 0.753	74	60.9 - 95.4

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

continued ...

Report Date: June 14, 2011 114-6400919			COG/	Work Or Dodd Fed			r Flood	l 		P	age Nur F		23 of 33 Co., NM
control spikes continued						G VI	3.6			-			
Param	F	C	LCSD Result	Units	Dil.	Spike Amoun		trix sult R	ec.		ec. mit	RPD	RPD Limit
			LCSD		•	Spike	Ma	trix		R	ec.		RPD
Param	$\mathbf{F}$	С	Result	Units	Dil.	Amoun			ec.			RPD	Limit
GRO		2	15.2	mg/Kg	1	20.0	<0.	753 ′	76	60.9	- 95.4	3	20
Percent recovery is based on the	spike	resu	ılt. RPD	is based o	on the s	spike and	l spike	duplica	te re	sult.			
			LC	S LCS	SD			Spike		LCS	LCSD		Rec.
Surrogate			Rest			Jnits	Dil.	Amour		Rec.	Rec.		imit
Trifluorotoluene (TFT)			1.9	1 2.0	0 n	g/Kg	1	2.00		96	100		9 - 142
4-Bromofluorobenzene (4-BFB)			1.79	9 1.8	6 n	g/Kg	1	2.00		90	93	68.	2 - 132
Param		F		LCS Result	Units			Spike mount	F	latrix lesult	Rec		Rec. Limit
Chloride				97.7	mg/Kg	g 1		100	<	<3.85	98	8	5 - 115
Percent recovery is based on the	spike	resu	lt. RPD	is based o	on the s	pike and	l spike	duplica	te res	sult.			
			LCSD			Spike	e M	atrix		R	ec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amou	nt R	esult	Rec.			RPD	Limit
Chloride			104	mg/Kg	1	100	<	3.85	104	85	- 115	6	20
	_			_									
Percent recovery is based on the Laboratory Control Spike (L			llt.  RPD	is based o	on the s	pike and	ł spike	duplica	te res	sult.			
Laboratory Control Spike (L			.i .i .i			-	l spike	duplica	te res	sult.	Analyz	ed Bv	AR
			Date	is based of the control of the contr	.: 201	1-06-08 1-06-07	l spike	duplica	te res	sult.	Analyz Prepar		
Laboratory Control Spike (L QC Batch: 82022 Prep Batch: 69605		·)	Date QC F	Analyzed Preparatio LCS	: 201 on: 201	1-06-08 1-06-07		Spike	M	Iatrix	Prepare	ed By:	AR.
Laboratory Control Spike (L QC Batch: 82022 Prep Batch: 69605			Date QC F	Analyzed 'reparatio LCS Result	: 201 n: 201 Units	1-06-08 1-06-07 Dil		Spike mount	M R	latrix æsult	Prepare Rec	ed By:	AR. Rec. Limit
Laboratory Control Spike (L QC Batch: 82022 Prep Batch: 69605	CS-1	F	Date QC F	Analyzed Preparatio LCS Result 95.6	: 201 n: 201 Units mg/K <sub>{</sub>	1-06-08 1-06-07 Dil	. A	Spike mount 100	M R	latrix esult	Prepare	ed By:	AR.

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 24 of 33 Eddy Co., NM

control	enikee	continued		
COREGICE	$\delta U u u c \delta$	COMMINGUELL	٠	٠

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
D	ъ	a	LCSD	TT 14-	Dil	Spike	Matrix	D	Rec.	DDD	RPD
Param	F.	C	Result	$\operatorname{Units}$	Dil.	$\mathbf{A}\mathbf{mount}$	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$
Chloride			104	mg/Kg	1	100	< 3.85	104	85 - 115	8	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: 82023 Prep Batch: 69605 Date Analyzed: QC Preparation: 2011-06-07

2011-06-08

Analyzed By: AR Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$
Chloride			94.7	mg/Kg	1	100	< 3.85	95	85 - 115

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

			LCSD			$_{ m Spike}$	Matrix		${ m Rec.}$		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			103	mg/Kg	1	100	<3.85	103	85 - 115	8	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: 69730

82132

Date Analyzed: QC Preparation:

2011-06-10 2011-06-10

Analyzed By: CM Prepared By: CM

			LCS			$\operatorname{Spike}$	Matrix		Rec.
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		ı	272	mg/Kg	1	250	<17.1	109	70 - 130

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	269	mg/Kg	1	250	<17.1	108	70 - 130	1	20

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 25 of 33

Eddy Co., NM

		1						
	LCS	LCSD	TT. ta.	D:I	Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	${ m Units}$	Dil.	Amount	Rec.	Rec.	$\operatorname{Limit}$
n-Tricosane	115	114	mg/Kg	1	100	115	114	70 - 130

## Laboratory Control Spike (LCS-1)

QC Batch:

82163

Date Analyzed:

2011-06-13

Analyzed By: AR

Prep Batch: 69605

QC Preparation: 2011-06-07

Prepared By: AR.

		1	LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride		i	96.5	mg/Kg	1	100	< 3.85	96	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	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			104	mg/Kg	1	100	< 3.85	104	85 - 115	8	20

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

Spiked Sample: 268066 Matrix Spike (MS-1)

QC Batch:

81910

Prep Batch: 69547

Date Analyzed:

2011-06-03

QC Preparation: 2011-06-03

Analyzed By: ME

Prepared By: ME

			MS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	C	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$
Benzene		2	1.80	mg/Kg	1	2.00	< 0.0118	90	80.5 - 112
Toluene		2	1.98	mg/Kg	1	2.00	< 0.00600	99	82.4 - 113
Ethylbenzene		2	1.76	mg/Kg	1	2.00	< 0.00850	88	83.9 - 114
Xylene		2	5.24	mg/Kg	1	6.00	< 0.00613	87	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	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		2	2.02	mg/Kg	1	2.00	< 0.0118	101	80.5 - 112	12	20
Toluene		2	2.18	mg/Kg	1	2.00	< 0.00600	109	82.4 - 113	10	20
Ethylbenzene		2	1.95	mg/Kg	1	2.00	< 0.00850	98	83.9 - 114	10	20
Xylene		2	5.82	mg/Kg	1	6.00	< 0.00613	97	84 - 114	10	20

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 26 of 33 Eddy Co., NM

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	${ m Rec.} \ { m Limit}$
Trifluorotoluene (TFT)	1.98	2.04	mg/Kg	1	2	99	102	41.3 - 117
4-Bromofluorobenzene (4-BFB)	1.96	2.01	mg/Kg	1	2	98	100	35.5 - 129

Matrix Spike (MS-1)

Spiked Sample: 268056

QC Batch:

81911

Date Analyzed:

2011-06-03

Analyzed By: ME

Prep Batch: 69547

QC Preparation: 2011-06-03

Prepared By: ME

Param	F	$\mathbf{c}^{[}$	MS Result	Units	Dil.	$egin{array}{c}  ext{Spike} \  ext{Amount} \end{array}$	Matrix Result	Rec.	$egin{array}{c} { m Rec.} \\ { m Limit} \end{array}$
GRO		2	27.3	nıg/Kg	1	20.0	11.2884	80	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	$\mathbf{F}$	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		2	24.6	mg/Kg	1	20.0	11.2884	66	61.8 - 114	10	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)	2.70	2.81	mg/Kg	1	2	135	140	50 - 162
4-Bromoffuorobenzene (4-BFB)	2.45	2.58	mg/Kg	1	2	122	129	50 - 162

Matrix Spike (MS-1) Spiked Sample: 268054

QC Batch:

82021

Date Analyzed:

2011-06-08

Analyzed By: AR.

Prep Batch: 69605

QC Preparation: 2011-06-07

Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	Ç	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
Chloride		!	18000	mg/Kg	100	10000	9490	85	80 - 120

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			19000	mg/Kg	100	10000	9490	95	80 - 120	5	20

114-6400919

Work Order: 11060239

COG/Dodd Federal Unit Water Flood

Page Number: 27 of 33

Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 268064

F

QC Batch:

82022

Date Analyzed:

2011-06-08 QC Preparation: 2011-06-07 Analyzed By: AR

Prepared By:

Prep Batch: 69605

MS

Spike Units Dil.

Matrix

Rec.

Param Chloride

Result F C 11800

mg/Kg 100

Amount Result 10000 2060

Rec. Limit 97

80 - 120

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

Param		
C(1.1 · 1.	 	_

**MSD** Result

Spike Dil. Amount Matrix Result

Rec. Rec.

RPD

Chloride

 $\mathbf{C}$ Units 12500 mg/Kg

100 10000 2060 104

Limit 80 - 120

**RPD** Limit 6 20

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

Matrix Spike (MS-1)

QC Batch: 82023 Spiked Sample: 268074

Date Analyzed:

2011-06-08

Analyzed By: AR

Prep Batch:

69605

QC Preparation:

2011-06-07

Prepared By: AR

P

			MS
'aram	F	$^{\mathrm{C}}$	Resul
9. Laniela			1.4000

Spike Matrix

Rec.

102

Rec.

Chloride

14600 mg/Kg 100

Units

Dil. Amount 10000

Result 4920

Rec. Limit

97 80 - 120

3

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

Param	
Chloride	

**MSD**  $\mathbf{C}$ Result

Spike Dil. Units Amount 100 mg/Kg 10000

Matrix Result

4920

Rec.

Limit

80 - 120

RPD RPDLimit

20

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

15100

Matrix Spike (MS-1)

Spiked Sample: 267519

F

 $\mathbf{F}$ 

QC Batch:

82132

Date Analyzed:

Units

2011-06-10

Analyzed By: CM

Prep Batch:

MS

Result

Prepared By:

69730

QC Preparation:

2011-06-10

Rec.

86

CM

Param

DRO

Dil.

Spike

Amount

Matrix

Result

Rec.

Limit

70 - 130

Report Date: June 14, 2011 114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 28 of 33 Eddy Co., NM

Param	F	С	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	${ m Rec.} \ { m Limit}$	RPD	$rac{ ext{RPD}}{ ext{Limit}}$
DRO		1	367	mg/Kg	1	250	148	88	70 - 130	1	20
Percent recovery is bas	sed on the spike	resu	lt. RPD	is based o	n the s	pike and sp	oike duplic	ate res	ult.		
Percent recovery is bas	sed on the spike M		lt. 'RPD : MSI		n the s	pike and sp	oike duplic Spike	ate res M		D	Rec.
Percent recovery is bas Surrogate	•	IS		)	n the s nits	pike and sp Dil.	-		IS MS		Rec.

Matrix Spike (MS-1)

Spiked Sample: 268080

QC Batch: 82163Prep Batch: 69605

Date Analyzed:

2011 - 06 - 13

QC Preparation: 2011-06-07

Analyzed By: AR

Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride		1	10600	mg/Kg	100	10000	989	96	80 - 120

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

			MSD			$\operatorname{Spike}$	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10900	mg/Kg	100	10000	989	99	80 - 120	3	20

114-6400919

Work Order: 11060239

COG/Dodd Federal Unit Water Flood

Page Number: 29 of 33

Eddy Co., NM

# Calibration Standards

Standard (CCV-1)

QC Batch: 81910

Date Analyzed: 2011-06-03

Analyzed By: ME

Param	$\operatorname{Flag}$	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/Kg	0.100	0.101	101	80 - 120	2011-06-03
Toluene		2	mg/Kg	0.100	0.106	106	80 - 120	2011-06-03
Ethylbenzene		2	mg/Kg	0.100	0.0904	90	80 - 120	2011-06-03
Xylene		2	mg/Kg	0.300	0.270	90	80 - 120	2011-06-03

Standard (CCV-2)

QC Batch: 81910

Date Analyzed: 2011-06-03

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/Kg	0.100	0.0988	99	80 - 120	2011-06-03
Toluene		2	mg/Kg	0.100	0.104	104	80 - 120	2011-06-03
Ethylbenzene		2	mg/Kg	0.100	0.0861	86	80 - 120	2011-06-03
Xylene		2	mg/Kg	0.300	0.259	86	80 - 120	2011-06-03

Standard (CCV-1)

QC Batch: 81911

Date Analyzed: 2011-06-03

Analyzed By: ME

			ľ	CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		2	mg/Kg	1.00	1.02	102	80 - 120	2011-06-03

Standard (CCV-2)

QC Batch: 81911

Date Analyzed: 2011-06-03

Analyzed By: ME

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 30 of 33 Eddy Co., NM

ħ	771	<b>a</b> .	<b></b>	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	$\operatorname{Flag}$	Cert	$\operatorname{Units}$	Conc.	$\operatorname{Conc}$ .	Recovery	$\operatorname{Limits}$	Analyzed
GRO		2	mg/Kg	1.00	1.16	116	80 - 120	2011-06-03

Standard (ICV-1)

QC Batch: 82021

Date Analyzed: 2011-06-08

Analyzed By: AR

				ICVs	ICVs	ICVs	Percent	
				${f True}$	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.1	99	85 - 115	2011-06-08

Standard (CCV-1)

QC Batch: 82021

Date Analyzed: 2011-06-08

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride	- 1-0		mg/Kg	100	101	101	85 - 115	2011-06-08

Standard (ICV-1)

QC Batch: 82022

Date Analyzed: 2011-06-08

Analyzed By: AR

				<b>ICVs</b>	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	97.7	98	85 - 115	2011-06-08

Standard (CCV-1)

QC Batch: 82022

Date Analyzed: 2011-06-08

Analyzed By: AR.

Report Date: J 114-6400919	June 14, 2011			Work Order Oodd Federal	: 11060239 Unit Water	Flood		mber: 31 of 33 Eddy Co., NM
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-06-08
Standard (IC	V-1)		:					
QC Batch: 82	023		Date	Analyzed: 2	2011-06-08		Analy	zed By: AR
Param	Flag	Cert	! Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	$\begin{array}{c} \text{Date} \\ \text{Analyzed} \end{array}$
Chloride	1 100		mg/Kg	100	98.0	98	85 - 115	2011-06-08
Standard (CC QC Batch: 82	•	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	zed By: AR  Date  Analyzed
Chloride		<u></u>	mig/Kg	100	102	102	85 - 115	2011-06-08
Standard (CC	CV-2)							
QC Batch: 82	132		Date A	Analyzed: 2	2011-06-10		Analy	zed By: CM
			1	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
<b>D</b>	171	<b>a</b> .	77 · .					
Param DRO	Flag	Cert	Units mg/Kg	Conc. 250	Conc. 277	Recovery 111	Limits 80 - 120	Analyzed 2011-06-10

Date Analyzed: 2011-06-10

Analyzed By: CM

Standard (CCV-3)

QC Batch: 82132

Work Order: 11060239 Page Number: 32 of 33 Report Date: June 14, 2011 Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood CCVs CCVsCCVsPercent True Found Percent Recovery Date  $\operatorname{Cert}$ Units Conc. Limits Analyzed Param Flag Conc. Recovery DRO 250 275 110 80 - 120 2011-06-10 mg/Kg 1 Standard (ICV-1) Date Analyzed: 2011-06-13 Analyzed By: AR QC Batch: 82163 **ICVs ICVs** ICVsPercent True Found Percent Recovery Date Conc. Param Flag  $\operatorname{Cert}$ Units Conc. Recovery Limits Analyzed 2011-06-13 Chloride mg/Kg 100 102 102 85 - 115 Standard (CCV-1)

Date Analyzed: 2011-06-13

CCVs

Found

Conc.

97.9

**CCVs** 

True

Conc.

100

CCVs

Percent

Recovery

98

Analyzed By: AR

Date

Analyzed

2011-06-13

Percent Recovery

Limits

85 - 115

QC Batch: 82163

Param

Chloride

Flag

Cert

Units

mg/Kg

114-6400919

Work Order: 11060239 COG/Dodd Federal Unit Water Flood Page Number: 33 of 33 Eddy Co., NM

# **Appendix**

# **Laboratory Certifications**

	Certifying	Certification	Laboratory
$^{\rm C}$	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704219-11-TX	Lubbock
2	NELAP	T104704392-10-TX	Midland

# Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

### Attachments

The scanned attachments will follow this page.

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

			Ċ	X	L	XC	#: Nobo	239																				_		
An	aıv	sis					est of Cha		tody	R	2	CC	rc	1								P/	٩GE		1		٠.		3	
							7					_			$\dashv$					(Circ				EQU Met			)			
						E	TETRA 1910 N. Big S Midland, Texa (432) 682-4559 •	Spring St.								5 (Ext. to C35)		d Cr Pb Hg Se	פר אי									DS		
CLIENT NAM	NE:						SITE MANAGER	i: aru L		ERS	T		SER'	VATIVE		1X100		Ba Cd	ag O		7/624	0/625						, pH, TDS		
PROJECT N	0.:	<del></del>		PRO	JE(	CT ·/	NAME:			CONTAIN	ξ.	T			١,	MOD.> TX1005		s Ag As	s Ag As	/olatiles	2940/89B	. Vol. 827	808	8	ن	Air)	(so)	s/Cation		
LAB I.D. NUMBER	DATE	TIM	E	MATRIX	COMP		Doubl Federal Uni Eddy Co., SAMPLE	ンベ E IDENTIFICATION		NUMBER OF CONTAINERS	FILTERED (Y/N)	HNO3	(3)	NONE	DTEY SOOTE	TPH X B015	PAH 8270	RCRA Metal	TCLP Volatif	TCLP Semi Volatiles	RCI	GC.MS Sem	PCB's 8080/608	Pest, 808/608	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations,		
<i>a</i> 68053	5/31			3	,		AU-1 0-1			1			X		,7	(X								7						
054						$\prod$	AH-1 1-151						$\prod$																$\coprod$	
055				$\prod$		$\prod$	A4-1 1.5'-2'																		igsqcut					
65%				$\prod$		$\parallel$	AH-Z 0-1			/					þ	( N													$\coprod$	
057						$\prod$	AH-Z 1-1.5'						$\parallel /$													L	Ц			
୦୬୪						$\prod$	AH-Z Z'-ZIS	<i>'</i>					$\coprod$																$\coprod$	
७५९				$\perp$			AH-Z 3-3.5																		$\parallel$				$\coprod$	
0,00						$\prod$	A14-Z 41-4.																	Ц					$\coprod$	
061						4	AH-2 51.50	5					1/														$\coprod$	$\perp$	$\perp \downarrow$	
90	*			*	1	7	AH-Z 6'-C			4			4	1										K	7	Ĺ				
RELINQUISMED	BY:#6igna	Lure) L					Date: 4-2-// Time: 1230	RECEIVED BY: (Signature)	·			Date Time					_			(Print			7/-	F			ime: _	_3 /	<b>3</b> 1/パ	
RELINQUISHED	BY: (Signa	eture)					Date:	RECEIVED BY: (Signature)				Date Time						MPLE		PED B		rcie) IUS					BILL #	#:		
RELINQUISHED	BY: (Signa	ture)					Date:	RECEIVED BY: (Signature)				Date Time	:				_			CONTA		IPS ERSO	N:			ОТІ	HER: _	uits by		
RECEIVING LAE ADDRESS: CITY:	ORATORY Hend		rc L T		Z PHO	ONE	ZIP:	RECEIVED BY: (Signature)		Š	E:	۱۲٬۰	3°0		-{	3~		TI	l't	To	. Va :	чE					Auti	SH Cha horized Yes	d:	No
SAMPLE COND	HW MOIT		ED:				REMARKS: If total TPH exc	erds 1,000 mg/Kg	, ru-deep	)er:	Sar	-plr	5 /	Tt exce		t	50	(XC)	ids /ke		-5 1	lkg		50				<u>:                                    </u>	4	<u></u> -
3m0	Pleas	e fill out	all c	opie OO	:s :\	- L	aboratory retains Yellow	copy - Return Orginal	copy to Tetra	а Те	ch -	Pro	jećt	Manag	er r	etaiı	ıs P	ink (	ору	- A	ccou	ıntin	g re	ceive	es G	iold	copy	у.		)

Town 10 27/10 0850

~WO#: 11060239 Analysis Request of Chain of Custody Record Z PAGE: ANALYSIS REQUEST (Circle or Specify Method No.) TETRA TECH 8 8 (Ext. to C35) 1910 N. Big Spring St. РЬ Нв 운 Midland, Texas 79705 2 (432) 682-4559 • Fax (432) 682-3946 5 ≽ 3 GC.MS Semi. Vol. 8270/625 CLIENT NAME: SITE MANAGER: **PRESERVATIVE** 8 COG Ike Tovarez **METHOD** PROJECT NO .: PROJECT NAME: COG | Dodd Edval Unit Water Flow FILTERED (Y/N) 114-6400919 Eddy Co. NM LAB I.D. MATRIX COMP. DATE TIME GRAB SAMPLE IDENTIFICATION NONE HNO3 NUMBER 호 SE ZON 5/31 7-75 *2*66063 AH- 7 81-85 AH-2 064 9'-95 A4.2 06 0-1 Olobo AH-3 1-15 0107 AH-3 2-2.5 Xdo AH-3 3-3,5 069 AH-3 4-4,5 9 AH-3 6-5.5 071 AH-3 RELINQUISHED BY: Signatur RECEIVED BY: (Signature) SAMPLED BY: (Print & Initial) Time: SAMPLE SHIPPED BY: (Circle) Date: RECEIVED BY: (Signature) RELINQUISHED BY: (Signature) OTHER: HAND DELIVERED RELINQUISHED BY: (Signature) RECEIVED BY: (Signature) Date: TETRA TECH CONTACT PERSON: Time: Truck RECEIVING LABORATORY: RECEIVED BY: (Signature) Ike Tavarte RUSH Charges

Flease fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

The 17th accreds 1,000 mg/kg run derper samp

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

The 15th of 15th accreds 1,000 mg/kg run derper samp

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

12:30

If BINZIME exceeds 10 mg/kg or total

Towns: To 27/2100

REMARKS:

SAMPLE CONDITION WHEN RECEIVED:

	4	<b>.</b>	(	<u>X</u>	Ų	<u>)</u> (	かりのに、一手に	239			_			_				_												
An	al	VS	is F	łе	d	Ш	est of Cha	ain of Cust	vbot	B	e	CO	rc	4	Ţ								PAG	E:	ق	3		<u></u>	3	
				_	_		<b>3</b>								$\dashv$					(Circ				REC			(o.)			
							Midland, Tex	Spring St.								6 (Ext. to C35)			Vr Pa ng se			,, o,						SQ		
CLIENT NAM	ME:	 !					SITE MANAGE	ER: Evacuz		NE RS			SER\	/ATIVE		TX1005	1	Ba Cd	Pa Cd			60/624	82/0/625					ns, pH, 1		
PROJECT N 114- 64		719		PR		ECT (O	NAME:	Unit Water Flood	(	CONTAI	(Ž)							ls Ag As	ils Ag Ar	Volatiles		8240/82	7. Vol. 8.	8 8			(Air)	ıs/Catio		
LAB I.D. NUMBER	DA Zo:		TIME	MATRIX	COMP	GRAB		LE IDENTIFICATION		NUMBER OF CONTAINERS	FILTERED (Y/N)	HNO3	ICE	NONE		BIEX 80206	PAH 8270	RCRA Metals Ag A	TCLP Metals Ag As Ba	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8	Pest. 808/6	Chlorida	Gamma Sp	Alpha Beta (Air)	Major Anions/Cations, pH, TDS		
266073	5/	31		5		K	AH-3 7-7,5	/		ľ			χ												X					
074						$\parallel$	AH-3 8-815			$\prod$			Ц												$\parallel$	Ц	$\perp$			
045				Ц			AH-3 9-95	<b>,</b>					<u> </u>			_			$\perp$						$\parallel$			$oldsymbol{\perp}$	$\coprod$	$\bot \!\!\! \bot$
र्जि				Ш		1	AH-4 0-1									X)	(						_	_	$\coprod$		$\perp$	$oldsymbol{\perp}$	$\coprod$	$\bot \bot$
077				Ц		$\parallel$	A4-4 1-1.5						Ц									_	$\perp$		$\coprod$	Ц		$\perp$	$\coprod$	$\downarrow \downarrow$
७२४				Ш			AH-4 2-25	<u></u>			_		$\coprod$			$\perp$	_	ig	$\perp$					_	Ц		$\downarrow$	$oldsymbol{\perp}$	igg	$\perp \! \! \! \! \! \perp$
079				Ш			Background 1's	-1.5		$\prod$	$\perp$	_	$\coprod$			$\downarrow$							_	1	$\prod$		$\downarrow$	$\downarrow$	$\coprod$	$\downarrow \downarrow$
080	7	7		4		V	Back ground 3	3.5		*	_	_	V			1				$\perp$		$\perp$	_ _	_	V	4	1	_	$\coprod$	$\downarrow \downarrow$
					L	L	,					$oldsymbol{\perp}$	<u> </u>		_	1							$\downarrow$	_	1			$\bot$	$\coprod$	4
RELINQUISINE	BY: (\$	gnatur	211.				Date: <u>6-2-1/</u> Time:	RECEIVED BY: (Signature)				Date:								: (Print				7/-	TF		Date Time		5/31	<u> </u>
RELINQUISHED RELINQUISHED							Date:  Time:  Date:	RECEIVED BY: (Signature)  RECEIVED BY: (Signature)				Date: Time. Date:					-c	FEDE HAND	DELI	VEREC	<u> </u>	BUS UPS					AIRBIL OTHEI	R:		
RECEIVING LAE ADDRESS: CITY: M CONTACT: SAMPLE COND	mon	when	STATE:			PHON	REMARKS: EL total TPH	DATE: 6.2.11  PRECEIVED BY: (Signature)  PRECEIVED BY: (Signature)  PRECEIVED BY: (Signature)  PRECEIVED BY: (Signature)	ky run de	-در،	er s	12	1.78°		ĺΧο	end	TE)	4X-	I /	CONT.	70.	-y	Jica Jica di	₹ { { { { { { { { { { { { { { { { { { {	) r   er	34	n 7:	ent Yes Ins	Charge: ized:	s No
700c			TA "	goo.	,ies	100	Laboratory retains Yellov	w copy - Return Orginal o	opy to letra	а Ге	ch -	Pro	ject	wana	ger	reta	ıns I	-≀nk	сору	- 4	,ccc	ount	ing	rece	orve	s Go	ia cc	ъру.		ن

Tem: TR 21/01/0 LS 71473616

# Summary Report

Ike Tavarez Tetra Tech

1910 N. Big Spring Street Midland, TX 79705 Report Date: October 6, 2011

Work Order: 11092631

Project Location: Eddy Co., NM

Project Name: C

COG/Dodd Federal Unit Water Flood

Project Number: 114-6400919

		1	Date	$\operatorname{Time}$	Date
Sample	Description	$\operatorname{Matrix}$	$\operatorname{Taken}$	Taken	Received
278367	BH-1 0-1'	soil	2011-09-23	00:00	2011-09-26
278368	BH-1 3'	soil	2011-09-23	00:00	2011-09-26
278369	BH-1 5'	soil	2011-09-23	00:00	2011-09-26
278370	BH-1 7'	soil	2011-09-23	00:00	2011-09-26
278371	BH-1 10'	soil	2011-09-23	00:00	2011-09-26
278372	BH-1 15'	soil	2011-09-23	00:00	2011-09-26
278373	BH-1 20'	soil	2011-09-23	00:00	2011-09-26
278374	BH-1 25'	soil	2011-09-23	00:00	2011-09-26
278375	BH-1 30'	soil	2011-09-23	00:00	2011-09-26
278376	BH-1 40'	soil	2011-09-23	00:00	2011-09-26
278377	BH-1 50'	soil	2011-09-23	00:00	2011-09-26
278378	BH-1 60'	soil	2011-09-23	00:00	2011-09-26
278381	BH-2 0-1'	soil	2011-09-23	00:00	2011-09-26
278382	BH-2 3'	soil	2011-09-23	00:00	2011-09-26
278383	BH-2 5'	soil	2011-09-23	00:00	2011-09-26
278384	BH-2 7'	soil	2011-09-23	00:00	2011-09-26
278385	BH-2 10'	soil	2011-09-23	00:00	2011-09-26
278386	BH-2 15'	soil	2011-09-23	00:00	2011-09-26
278387	BH-2 20'	soil	2011-09-23	00:00	2011-09-26
278388	BH-2 25'	soil	2011-09-23	00:00	2011-09-26
278389	BH-2 30'	soil	2011-09-23	00:00	2011-09-26
278390	BH-2 40'	soil	2011-09-23	00:00	2011-09-26
278391	BH-2 50'	soil	2011-09-23	00:00	2011-09-26
278392	BH-2 60'	soil	2011-09-23	00:00	2011-09-26
278397	BH-3 10'	soil	2011-09-23	00:00	2011-09-26
278398	BH-3 15'	soil	2011-09-23	00:00	2011-09-26
278399	BH-3 20'	soil	2011-09-23	00:00	2011-09-26
278400	BH-3 25'	soil	2011-09-23	00:00	2011-09-26
278401	BH-3 30'	soil	2011-09-23	00:00	2011-09-26
278402	BH-3 40'	soil	2011-09-23	00:00	2011-09-26

Report Date:	October 6, 2011	Work	Order: 11092631	Pag	ge Number: 2 of 6
Sample 278403	Description BH-3 50'	Matrix soil	Date Taken 2011-09-23	Time Taken 00:00	Date Received 2011-09-26
278404	BH-3 60'	soil	2011-09-23	00:00	2011-09-26
Sample, 276	3367 - BH-1 0-1'				
Param	Flag		Result	Units	RL
Chloride	Flag		3570	mg/Kg	4
Sample: 278	3368 - BH-1 3'				
Param	Flag		Result	Units	RL
Chloride			3650	mg/Kg	4
Sample: 278	369 - BH-1 5'	 			
Param	Flag		Result	Units	RL
Chloride		l I	6140	mg/Kg	4
Sample: 278	370 - BH-1 7'				
Param	Flag		Result	Units	RL
Chloride			3110	mg/Kg	4
Sample: 278	371 - BH-1 10'				
Param	Flag		Result	Units	RL
Chloride			3640	mg/Kg	4
Sample: 278	372 - BH-1 15'				
Param	$\mathbf{Flag}$	1	Result	Units	RL
Chloride			2780	mg/Kg	4
Committee 070	979 DII 1 001				
sample: 278	373 - BH-1 20'				continued

Report Date: Octob	per 6, 2011	Work Order: 11092631	Page	Number: 3 of 6
sample 278373 cont	$inued \dots$			
Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride		2170	mg/Kg	4
Sample: 278374 -	· BH-1 25'			
Param	Flag	Result	Units	RL
Chloride		4910	mg/Kg	4
Sample: 278375 -	· BH-1 30'			
Param	Flag	Result	Units	RL
Chloride		1150	mg/Kg	4
Sample: 278376 -	ВН-1 40'	1		
Param	Flag	Result	Units	RL
Chloride		952	mg/Kg	4
Sample: 278377 -	· BH-1 50'			
Param	Flag	Result	Units	RL
Chloride		849	mg/Kg	4
Sample: 278378 -	· BH-1 60'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 278381 -	· BH-2 0-1'	1		
Param	Flag	Result	Units	RL
Chloride		5150	mg/Kg	4

Sample: 278382 - BH-2 3'

Report Date: Octo	ber 6, 2011	Work Order: 11092631	Page I	Number: 4 of 6
Param	Flag	Result	Units	m RL
Chloride		7250	nig/Kg	4
Sample: 278383	- BH-2 5'			
Param	Flag	Result	Units	RL
Chloride		1410	mg/Kg	4
Sample: 278384 -	- BH-2 7'			
Param	Flag	Result	Units	RL
Chloride		4510	mg/Kg	4
Sample: 278385 -	- BH-2 10'			
Param	Flag	Result	Units	RL
Chloride		1920	mg/Kg	4
Sample: 278386 -	- BH-2 15'			
Param	Flag	Result	Units	RL
Chloride		1490	mg/Kg	4
Sample: 278387 -	- BH-2 20'			
Param	Flag	Result	Units	RL
Chloride		1490	mg/Kg	4
Sample: 278388 -	- BH-2 25'			
Param	Flag	Result	Units	RL
Chloride		1050	mg/Kg	4
Sample: 278389 -	· BH-2 30'			
Param	Flag	Result	Units	RL
Chloride		236	mg/Kg	4

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.

	ber 6, 2011	Work Order: 11092631	Page N	Number: 5 of 6
Sample: 278390	- BH-2 40'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 278391	- BH-2 50'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 278392	- BH-2 60'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Param Chloride	Flag	Result 1900	Units mg/Kg	RL 4
Cinoride				
Sample: 278398	- BH-3 15'			
Sample: 278398				RL
	- BH-3 15' Flag	Result 3730	Units mg/Kg	RL 4
Sample: 278398 • Param	Flag	Result	Units	
Sample: 278398 Param Chloride	Flag	Result	Units	
Sample: 278398 Param Chloride Sample: 278399	Flag - BH-3 20'	Result <b>3730</b>	Units mg/Kg	4
Sample: 278398 Param Chloride Sample: 278399 Param	Flag - BH-3 20' Flag	Result 3730  Result	Units mg/Kg Units	4 RL
Sample: 278398 Param Chloride  Sample: 278399 Param Chloride  Sample: 278400	Flag - BH-3 20' Flag	Result 3730  Result 2740	Units mg/Kg Units mg/Kg	RL 4
Sample: 278398 Param Chloride  Sample: 278399 Param Chloride	Flag - BH-3 20' Flag	Result 3730  Result	Units mg/Kg Units	4 RL
Sample: 278398 Param Chloride  Sample: 278399 Param Chloride  Sample: 278400 Param	Flag - BH-3 20' Flag - BH-3 25' Flag	Result 3730  Result 2740  Result	Units mg/Kg  Units mg/Kg  Units	RL 4 RL
Sample: 278398  Param Chloride  Sample: 278399  Param Chloride  Sample: 278400  Param Chloride	Flag - BH-3 20' Flag - BH-3 25' Flag	Result 3730  Result 2740  Result	Units mg/Kg  Units mg/Kg  Units	RL 4 RL

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: October 6, 2011		Work Order: 11092631	Pa	ge Number: 6 of 6
Sample: 278402	- BH-3 40'			
Param	Flag	Result	Units	RL
Chloride	**************************************	<200	mg/Kg	4
Sample: 278403	- BH-3 50'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 278404	- BH-3 60'	: :		
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E

5002 Basin Street, Suite A1 6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

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

888 • 568 • 3443

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

FAX 915 • 585 • 4944 FAX 432 - 689 - 6313

E-Mail: lab@traceanalysis.com

### Certifications

NELAP DoD LELAP Kansas Oklahoma ISO 17025 HUB NCTRCA  $\mathbf{DBE}$ 

## Analytical and Quality Control Report

Ike Tavarez

Tetra Tech

1910 N. Big Spring Street

Midland, TX, 79705

Report Date:

October 6, 2011

Work Order:

11092631

Project Location: Eddy Co., NM

Project Name:

COG/Dodd Federal Unit Water Flood

Project Number:

114-6400919

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
278367	BH-1 0-1'	soil	2011-09-23	00:00	2011-09-26
278368	BH-1 3'	soil	2011-09-23	00:00	2011-09-26
278369	BH-1 5'	soil	2011-09-23	00:00	2011-09-26
278370	BH-1 7'	soil	2011-09-23	00:00	2011-09-26
278371	BH-1 10'	soil	2011-09-23	00:00	2011-09-26
278372	BH-1 15'	soil	2011-09-23	00:00	2011-09-26
278373	BH-1 20'	soil	2011-09-23	00:00	2011-09-26
278374	BH-1 25'	soil	2011-09-23	00:00	2011-09-26
278375	BH-1 30'	soil	2011-09-23	00:00	2011-09-26
278376	BH-1 40'	soil	2011-09-23	00:00	2011-09-26
278377	BH-1 50'	soil	2011-09-23	00:00	2011-09-26
278378	BH-1 60'	soil	2011-09-23	00:00	2011-09-26
278381	BH-2 0-1'	soil	2011-09-23	00:00	2011-09-26
278382	BH-2 3'	soil	2011-09-23	00:00	2011-09-26
278383	BH-2 5'	soil	2011-09-23	00:00	2011-09-26
278384	BH-2 7'	soil	2011-09-23	00:00	2011-09-26
278385	BH-2 10'	soil	2011-09-23	00:00	2011-09-26
278386	BH-2 15'	soil	2011-09-23	00:00	2011-09-26

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
278387	BH-2 20'	soil	2011-09-23	00:00	2011-09-26
278388	BH-2 25'	soil	2011-09-23	00:00	2011-09-26
278389	BH-2 30'	soil	2011-09-23	00:00	2011-09-26
278390	BH-2 40'	soil	2011-09-23	00:00	2011-09-26
278391	BH-2 50'	soil	2011-09-23	00:00	2011-09-26
278392	BH-2 60'	soil	2011-09-23	00:00	2011-09-26
278397	BH-3 10'	soil	2011-09-23	00:00	2011-09-26
278398	BH-3 15'	soil	2011-09-23	00:00	2011-09-26
278399	BH-3 20'	soil	2011-09-23	00:00	2011-09-26
278400	BH-3 25'	soil	2011-09-23	00:00	2011-09-26
278401	BH-3 30°	soil	2011-09-23	00:00	2011-09-26
278402	BH-3 40'	soil	2011-09-23	00:00	2011-09-26
278403	BH-3 50'	soil	2011-09-23	00:00	2011-09-26
278404	BH-3 60'	soil	2011-09-23	00:00	2011-09-26

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 25 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

# Report Contents

Case Narrative	
Analytical Report	<b>1</b>
Sample 278367 (BH-1 0-1')	4
	· · · · · · · · · · · · · · · · · · ·
	·
	· 
Sample 278374 (BH-1 25')	J
Sample 278375 (BH-1 30')	1
	· · · · · · · · · · · · · · · · · · ·
Sample 278382 (BH-2 3')	
Sample 278382 (BH-2 5')	1
	<u> </u>
	<u> </u>
	j
Cample 270303 (DH 2 40)	i i
Comple 270090 (DH 2 KO)	j
Cample 270301 (DH 2 60)	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
Sample 278401 (BH-3 30')	
Sample 278402 (BH-3 40)	
Sample 278404 (BH-3 60°)	1
Method Blanks	
	:
	· · · · · · · · · · · · · · · · · · ·
«C Datch 63270 - Method Diank (1)	<b></b>
Laboratory Control Spikes	i
	1

QC Batch 85274 - LCS (1)	·	 	18
QC Batch 85275 - LCS (1)		 	19
QC Batch 85276 - LCS (1)			
QC Batch 85272 - MS (1)	A. Committee of the com		
QC Batch 85273 - MS (1)			
QC Batch 85274 - MS (1)			
QC Batch 85275 - MS (1)			
QC Batch 85276 - MS (1)			
QC Balch 60270 - MB (1)		 	20
Calibration Standards			22
QC Batch 85272 - ICV (1)		 	22
QC Batch 85272 - CCV (1)		 	22
QC Batch 85273 - ICV (1)			
QC Batch 85273 - CCV (1)			
QC Batch 85274 - ICV (1)			
QC Batch 85274 - CCV (1)			
QC Batch 85275 - ICV (1)			_
QC Batch 85275 - CCV (1)			
QC Batch 85276 - ICV (1)			
QC Batch 85276 - CCV (1)		 	24
Appendix	1		25
Laboratory Certifications			
Standard Flags			
Attachments		 	20

# Case Narrative

Samples for project COG/Dodd Federal Unit Water Flood were received by TraceAnalysis, Inc. on 2011-09-26 and assigned to work order 11092631. Samples for work order 11092631 were received intact at a temperature of 1.3 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	72370	2011-10-03 at 09:30	85272	2011-10-04 at 16:25
Chloride (Titration)	SM 4500-Cl B	72370	2011-10-03 at 09:30	85273	2011-10-04 at 16:26
Chloride (Titration)	SM 4500-Cl B	72370	2011-10-03 at 09:30	85274	2011-10-04 at 16:27
Chloride (Titration)	SM 4500-Cl B	72370	2011-10-03 at 09:30	85275	2011-10-04 at 16:51
Chloride (Titration)	$\mathrm{SM}\ 4500\text{-}\mathrm{Cl}\ \mathrm{B}$	72370	2011-10-03 at 09:30	85276	2011-10-04 at 16:52

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 11092631 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.

Report Date: October 6, 2011

114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 6 of 25 Eddy Co., NM

Prep Method: N/A

AR.

AR

## **Analytical Report**

Sample: 278367 - BH-1 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 85272 Prep Batch:

72370

Analytical Method:

Sample Preparation:

Date Analyzed:

SM 4500-Cl B

2011-10-04

Analyzed By: 2011-10-03 Prepared By:

RL

Flag Cert Result Units Dilution RLParameter 3570 4.00 Chloride mg/Kg 100

Sample: 278368 - BH-1 3'

Laboratory:

Midland

Chloride (Titration) Analysis: QC Batch: 85272

Prep Batch: 72370

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-10-04

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

Sample Preparation: 2011-10-03

RL

Parameter Flag Cert Result Units Dilution RLChloride 3650 mg/Kg 100 4.00

Sample: 278369 - BH-1 5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 85272 Prep Batch: 72370 Analytical Method:

Sample Preparation:

Date Analyzed:

SM 4500-Cl B 2011-10-04

2011-10-03

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

RL

Cert Result Units Dilution RLParameter Flag Chloride 6140 mg/Kg 100 4.00 Report Date: October 6, 2011 114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 7 of 25

Eddy Co., NM

Sample: 278370 - BH-1 7'

Laboratory: Midland Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

85272

Date Analyzed:

2011-10-04

Analyzed By: AR

Prep Batch:

72370

Sample Preparation:

2011-10-03

Prepared By: AR

RL

Parameter Chloride

Cert Flag

Result 3110

Units mg/Kg Dilution

100

RL4.00

Sample: 278371 - BH-1 10'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

AR

QC Batch:

85272

Date Analyzed:

2011-10-04

Analyzed By:

Prep Batch:

72370

Sample Preparation:

2011-10-03

Prepared By: AR

RL

Units

Parameter Chloride

Cert

Result 3640

mg/Kg

Dilution 100

RL4.00

Sample: 278372 - BH-1 15'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

85272

Date Analyzed:

2011-10-04

Analyzed By: AR

Prep Batch:

72370

Sample Preparation:

Prepared By:

2011-10-03

AR.

Flag

Parameter

Flag

Cert Result

RL

Chloride

2780

Units mg/Kg

Dilution

100

RL4.00

Sample: 278373 - BH-1 20'

Laboratory:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

Analysis: QC Batch: Prep Batch:

72370

85273

Date Analyzed: Sample Preparation:

2011-10-04 2011-10-03

Analyzed By:

AR. Prepared By: AR

Report Date 114-6400919	Report Date: October 6, 2011 114-6400919		rk Order: 110 Federal Univ	Page Number: 8 of 2 Eddy Co., N		
Parameter	Flag	! Cert	RL Result	$_{ m Units}$	Dilution	RL
Chloride	Flag	Cert	2170	mg/Kg	100	4.00
	Manager Manage					<u>,                                    </u>
Sample: 27	8374 - BH-1 25'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85273 72370	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			RL			
Parameter Chloride	Flag	Cert	Result 4910	Units nig/Kg	Dilution 100	$\frac{RL}{4.00}$
		ř				
Sample: 27 Laboratory: Analysis: QC Batch:	8375 - BH-1 30' Midland Chloride (Titration) 85273	Date An		SM 4500-Cl B 2011-10-04	Prep Method: Analyzed By:	N/A AR
Sample: 27 Laboratory: Analysis:	Midland Chloride (Titration)	Date An	alyzed: Preparation:			
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85273 72370	Date An Sample I	alyzed: Preparation: RL	2011-10-04 2011-10-03	Analyzed By: Prepared By:	AR AR
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85273	Date An	alyzed: Preparation: RL Result	2011-10-04 2011-10-03 Units	Analyzed By: Prepared By: Dilution	AR AR RL
Sample: 27. Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 85273 72370	Date An Sample I	alyzed: Preparation: RL	2011-10-04 2011-10-03	Analyzed By: Prepared By:	AR AR
Sample: 27. Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 85273 72370 Flag	Date An Sample I	alyzed: Preparation: RL Result	2011-10-04 2011-10-03 Units	Analyzed By: Prepared By: Dilution	AR AR RL
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride  Sample: 27 Laboratory: Analysis:	Midland Chloride (Titration) 85273 72370  Flag  8376 - BH-1 40'  Midland Chloride (Titration)	Date An Sample I	alyzed: Preparation: RL Result 1150	2011-10-04 2011-10-03 Units mg/Kg  SM 4500-Cl B	Analyzed By: Prepared By:  Dilution  100  Prep Method:	AR AR RL 4.00
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride  Sample: 27 Laboratory:	Midland Chloride (Titration) 85273 72370  Flag  8376 - BH-1 40' Midland	Date An Sample I Cert  Analytic Date An	alyzed: Preparation: RL Result 1150  al Method: alyzed: Preparation:	2011-10-04 2011-10-03 Units mg/Kg	Analyzed By: Prepared By:  Dilution  100	AR AR RL 4.00
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride  Sample: 27 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 85273 72370  Flag  8376 - BH-1 40'  Midland Chloride (Titration) 85273	Date An Sample I Cert  Analytic Date An	alyzed: Preparation: RL Result 1150  al Method: alyzed:	2011-10-04 2011-10-03 Units mg/Kg  SM 4500-Cl B 2011-10-04	Analyzed By: Prepared By:  Dilution  100  Prep Method: Analyzed By:	AR AR RL 4.00

Work Order: 11092631 Page Number: 9 of 25 Report Date: October 6, 2011 114-6400919 COG/Dodd Federal Unit Water Flood Eddy Co., NM Sample: 278377 - BH-1 50' Laboratory: Midland Prep Method: N/A Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Analyzed By: QC Batch: 85273 Date Analyzed: 2011-10-04 ARPrep Batch: 72370 Sample Preparation: 2011-10-03 Prepared By: AR RLParameter Cert Result Units Dilution RLFlag Chloride 849 mg/Kg 50 4.00 Sample: 278378 - BH-1 60' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A 2011-10-04 Analyzed By: QC Batch: 85273 Date Analyzed: ARPrep Batch: 72370 Sample Preparation: 2011-10-03 Prepared By: AR RLCert Dilution RLParameter Flag Result Units Chloride < 200  $\overline{50}$ 4.00 mg/Kg Sample: 278381 - BH-2 0-1' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 85273 Date Analyzed: 2011-10-04 Analyzed By: ARPrep Batch: 72370 Sample Preparation: 2011-10-03 Prepared By: ARRLDilution RLParameter Flag Cert Result Units Chloride 5150 mg/Kg 100 4.00

Analytical Method:

Sample Preparation:

Date Analyzed:

SM 4500-Cl B

2011-10-04

2011-10-03

Prep Method:

Analyzed By:

Prepared By:

N/A

AR

AR

Sample: 278382 - BH-2 3'

Midland

85273

72370

Chloride (Titration)

Laboratory:

Prep Batch:

Analysis: QC Batch:

Report Date: October 6, 2011 114-6400919		Work Order: 11092631 COG/Dodd Federal Unit Water Flood			Page Number: 10 of 25 Eddy Co., NM		
Parameter	Flag	Cert	RL Result	Units	Dilution	RL	
Chloride			7250	mg/Kg	100	4.00	
Sample: 27	'8383 - BH-2 5'						
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR	
Damasmatan	Flor	Cont	RL	Ilmita	Dibution	DI	
Parameter Chloride	Flag	Cert	Result 1410	Units mg/Kg	Dilution 100	$\frac{RL}{4.00}$	
	8384 - RH-2 7'						
	8384 - BH-2 7' Midland Chloride (Titration) 85274 72370	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR	
Sample: 27 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 85274	Date An	alyzed:	2011-10-04	Analyzed By:	AR	
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274	Date An	alyzed: Preparation: RL Result	2011-10-04 2011-10-03 Units	Analyzed By: Prepared By: Dilution	AR. AR.	
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Date An Sample l	alyzed: Preparation: RL	2011-10-04 2011-10-03	Analyzed By: Prepared By:	AR. AR.	
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 85274 72370	Date An Sample l	alyzed: Preparation: RL Result	2011-10-04 2011-10-03 Units	Analyzed By: Prepared By: Dilution	AR. AR.	
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration) 85274 72370 Flag	Date An Sample I Cert Analytic Date An	alyzed: Preparation: RL Result 4510  al Method: alyzed: Preparation:	2011-10-04 2011-10-03 Units	Analyzed By: Prepared By: Dilution	AR. AR.	
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride  Sample: 27 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 85274 72370  Flag  8385 - BH-2 10'  Midland Chloride (Titration) 85274	Date An Sample I Cert Analytic Date An	alyzed: Preparation: RL Result 4510  al Method: alyzed:	2011-10-04 2011-10-03 Units mg/Kg  SM 4500-Cl B 2011-10-04	Analyzed By: Prepared By:  Dilution  100  Prep Method: Analyzed By:	AR. AR.  RL  4.00	

		•				
Report Date 114-6400919	:: October 6, 2011	Work Orde COG/Dodd Federa			Page Number: 1 Eddy Co	
Sample: 27	'8386 - BH-2 15'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Analytical Met Date Analyzed: Sample Prepara	:	SM 4500-CI B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Parameter Chloride	Flag		RL Result 1490	Units mg/Kg	Dilution 100	RL 4.00
_	8387 - BH-2 20'	:				
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Analytical Met Date Analyzed Sample Prepara	:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Parameter	Flag	; Cert F	RL Result	Units	Dilution	RL
Chloride			1490	mg/Kg	100	4.00
Sample: 27	8388 - BH-2 25'	:				
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Analytical Met Date Analyzed: Sample Prepara	:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1050	mg/Kg	100	4.00
Sample: 27	8389 - BH-2 30'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Analytical Met Date Analyzed: Sample Prepara		SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR

Report Date: October 6, 2011 114-6400919			Work Order: 11092631 COG/Dodd Federal Unit Water Flood			2 of 25 o., NM
Parameter Chloride	Flag	Cert	RL Result	Units mg/Kg	Dilution 50	RL 4.00
Chloride			230	шу/ку	50	4.00
Sample: 27	'8390 - BH-2 40'	· !				
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Date A	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
D	T)	<b>G</b> .	RL	T7 */	Dilect	Dī
Parameter Chloride	Flag	Cert	Result <200	Units mg/Kg	Dilution 50	$\frac{\text{RL}}{4.00}$
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Date Ar	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			RL			
Parameter Chloride	Flag u	Cert	Result <200	Units mg/Kg	Dilution 50	$\frac{RL}{4.00}$
Sample: 27	'8302 - BH-2 60'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85274 72370	Date Ar	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Analysis: QC Batch:	Midland Chloride (Titration) 85274	Date Ar	nalyzed:	2011-10-04	Analyzed By:	AR.
Analysis: QC Batch:	Midland Chloride (Titration) 85274	Date Ar	nalyzed: Preparation:	2011-10-04	Analyzed By:	AR.

i

Report Date: October 6, 2011 114-6400919			Work Order: 11092631 COG/Dodd Federal Unit Water Flood		Page Number: 13 of Eddy Co., N		
Sample: 27	'8397 - BH-3 10'	1					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85275 72370	Analytical Method: Date Analyzed: Sample Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/ AI AI		
		RL					
Parameter Chloride	Flag	Cert Result 1900	Units mg/Kg	Dilution 100	4.		
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	78398 - BH-3 15'  Midland Chloride (Titration) 85275 72370	Analytical Method: Date Analyzed: Sample Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N/ AI AI		
Parameter	Flag	RL Cert Result	Units	Dilution	I		
Chloride		3730	mg/Kg	100	4.		
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	78399 - BH-3 20' Midland Chloride (Titration) 85275 72370	Analytical Method: Date Analyzed: Sample Preparation:	SM 4500-Cl B 2011-10-04 2011-10-03	Prep Method: Analyzed By: Prepared By:	N, Al Al		
Parameter Chloride	Flag	$ \begin{array}{cc} & & \text{RL} \\ & \text{Cert} & \text{Result} \end{array} $	Units	Dilution	1		
C11. 1		2740	mg/Kg	100	4.		

Report Date 114-6400919	: October 6, 2011		Work Order: 11092631 COG/Dodd Federal Unit Water Flood		Page Number: 1- Eddy Co	
Parameter Chloride	Flag		RL esult	Units	Dilution	RL
Cnioride			1160	mg/Kg	100	4.00
Sample: 27	8401 - BH-3 30'	;				
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85275 72370	Analytical Meth Date Analyzed: Sample Prepara	20	И 4500-С1 В 11-10-04 11-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
		1	RL			
Parameter Chloride	Flag	Cert R	esult 203	Units mg/Kg	Dilution 50	$\frac{RL}{4.00}$
Sample: 27 Laboratory: Analysis: QC Batch: Prep Batch:	8402 - BH-3 40'  Midland Chloride (Titration) 85275 72370	Analytical Meth Date Analyzed: Sample Prepara	20	I 4500-Cl B 11-10-04 11-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR AR
2.10p =		,	RL		<b> </b>	
Parameter	Flag	Cert R	esult	Units	Dilution	RL
C11 1 1.		1	<000	mg/Kg	50	4.00
Chloride			<200	9, 0	00	4.00
	8403 - BH-3 50'		<200	<u> </u>		4.00
	8403 - BH-3 50'  Midland Chloride (Titration) 85276 72370	Analytical Meth Date Analyzed: Sample Prepara	od: SN 20'	4 4500-Cl B 11-10-04 11-10-03	Prep Method: Analyzed By: Prepared By:	
Sample: 27 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 85276	Analytical Meth Date Analyzed: Sample Prepara	od: SM 20 tion: 20	4 4500-Cl B 11-10-04 11-10-03	Prep Method: Analyzed By: Prepared By:	N/A AR
Sample: 27 Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 85276	Analytical Meth Date Analyzed: Sample Prepara Cert R	od: SM 20' tion: 20'	И 4500-СІ В 11-10-04	Prep Method: Analyzed By:	N/A AR

Report Date: October 6, 2011 Work Order: 11092631 Page Number: 15 of 25 114-6400919 i COG/Dodd Federal Unit Water Flood Eddy Co., NM Sample: 278404 - BH-3 60' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 85276 Date Analyzed: 2011-10-04 Analyzed By: ARPrep Batch: 72370 Sample Preparation: 2011-10-03 Prepared By: ARRLParameter Flag  $\operatorname{Cert}$ Result Units Dilution RL $\overline{\text{Chloride}}$ <200 50 4.00 mg/Kg U

Report Date: October 6, 2011

114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 16 of 25 Eddy Co., NM

### Method Blanks

Method Blank (1)

QC Batch: 85272

QC Batch: Prep Batch:

85272 72370

Date Analyzed:

2011-10-04

Analyzed By: AR

QC Preparation:

2011-10-03

Prepared By:

MDL

Parameter Flag Chloride

Cert Result < 3.85

RLUnits mg/Kg 4

Method Blank (1)

QC Batch: 85273

QC Batch: 85273 Prep Batch: 72370

Date Analyzed: QC Preparation:

Cert

2011-10-04 2011-10-03

MDL

Result

< 3.85

 $< 3.8\overline{5}$ 

Analyzed By: AR. Prepared By: AR

Parameter Flag Chloride

Units RL

4

Method Blank (1)

QC Batch: 85274

QC Batch: Prep Batch: 72370

85274

Date Analyzed:

2011-10-04

Analyzed By: AR

QC Preparation: 2011-10-03 Prepared By: AR.

Parameter Flag Chloride

MDL Cert Result

Units RL

mg/Kg

mg/Kg

Method Blank (1)

QC Batch: 85275

QC Batch: 85275 Prep Batch: 72370

Date Analyzed: QC Preparation: 2011-10-04 2011-10-03

Analyzed By: AR. Prepared By: AR

Report Date: October 6, 2011 114-6400919		ler: 11092631 ral Unit Water Flood	Page Number: 17 of 25 Eddy Co., NM		
Parameter Fla Chloride	g Cert	MDL Result <3.85	Units	RL 4	
Ollowing		<b>VO.00</b>	mg/Kg		
Method Blank (1) QC Batch: 8527	6				
QC Batch: 85276	Date Analyzed:	2011-10-04	Analyzed By:	AR	
Prep Batch: 72370	QC Preparation:	2011-10-03	Prepared By:	AR	
	1 1	MDL			
Parameter Fla	g   Cert	Result	Units	RL	
Chloride		< 3.85	mg/Kg	4	

Report Date: October 6, 2011 114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 18 of 25 Eddy Co., NM

# Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:

Date Analyzed:

2011-10-04

Analyzed By: AR

Prep Batch: 72370

QC Preparation: 2011-10-03

Prepared By: AR.

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
Chloride			95.1	mg/Kg	1	100	< 3.85	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	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$\mathbf{Limit}$
Chloride			103	mg/Kg	1	100	< 3.85	103	85 - 115	8	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: 72370

Date Analyzed:

2011-10-04 QC Preparation: 2011-10-03 Analyzed By: AR Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			96.1	mg/Kg	1	100	<3.85	96	85 - 115

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

Param	E.	C	LCSD	Units	Dil.	Spike	Matrix Result	Rec.	Rec. Limit	RPD	RPD
1 at alli	Г	C	Result	Omes	DII.	Amount	nesun	nec.		RED	Limit
Chloride			103	mg/Kg	1	100	< 3.85	103	85 - 115	7	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: 85274 Prep Batch: 72370 Date Analyzed: 2011-10-04 QC Preparation: 2011-10-03

Analyzed By: AR Prepared By: AR

Report Date: October 6, 2011 114-6400919			COG	Work C /Dodd Fed	Page Number: 19 of 2 Eddy Co., NA						
Param		F	C	LCS Result	Units	Dil.	Spike Amount		t Rec		Rec.
Chloride			<u> </u>	95.8	mg/Kg	1	100	<3.85	96		85 - 115
Percent recovery is based on the	ne spike	result.	. RPD	is based o	on the sp	oike and sp	oike duplica	ate result.			
Param	F		LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec. I	Rec. Jimit	RPD	RPD Limit
Chloride			105	mg/Kg	1	100	< 3.85	105 85	- 115	9	20
Percent recovery is based on the Laboratory Control Spike			RPD	is based c	n me st	orke and sj	оке дириса	ite resuit.			
QC Batch: 85275	(DOS-1)	,	Date	· Analyzed	: 201	1-10-04			Analyz	ed By	/: AR
Prep Batch: 72370			1	Preparatio		1-10-03			Prepar		
Param Chloride		F	C	LCS Result	Units mg/Kg	Dil.	Spike Amount 100	Matrix Result	Rec		Rec. Limit 85 - 118
Percent recovery is based on th	no eniko	rocult	RPD			ika and er				-	
referre recovery is based on a	ie spike		İ	is based b	ur ene st	_	-				
D.	Б		LCSD	77 **	Du	Spike	Matrix		Rec.	חחח	RPD
Param Chloride	F	C	Result 105	Units mg/Kg	Dil.	Amount 100	Result <3.85		imit - 115	$\frac{\text{RPD}}{8}$	Limit 20
Percent recovery is based on th									- 110		
<b>Laboratory Control Spike (</b> QC Batch: 85276 Prep Batch: 72370	-	ļ	Date	· Analyzed Preparatio	: 201	1-10-04 1-10-03	•		Analyz Prepar		
Param ·		F ¦	C .	LCS Result	Units	Dil.	Spike Amount	Matrix Result			Rec. Limit
Chloride		<del></del>			mg/Kg	1	100	< 3.85			35 - 115
Percent recovery is based on th	ie spike i	result.	RPD			ike and sp	ike duplica	te result.			
*	-	į	LCSD		-	Spike	Matrix		Rec.		RPD
Param	F	i	Result	Units	Dil.	Amount	Result			RPD	Limit
Chloride			102	mg/Kg	1	100	<3.85		- 115	6	20
Percent recovery is based on the	ne spike i	result.	RPD		n the sp	ike and sp	ike duplica	te result.			

114-6400919		COG	/Dodd I		Eddy Co., NM					
Matrix Spike (MS-1)	Spiked Sample	: 278372								
QC Batch: 85272		Date	Analyz	ed: 20	011-10-04			Anal	yzed By	: AR
Prep Batch: 72370			Preparat		011-10-03				ared By	
•		!	•					·		
		 	MS			Spike	Mat	rix	F	Rec.
Param	F		esult	Units	Dil.	Amount	Res			imit
Chloride		15	2800	mg/Kg	100	10000	278	80 100	79.4	- 120.6
Percent recovery is based	on the spike resu	ılt. RPD	is based	l on the	spike and	spike dup	licate re	sult.		
		MSD			Spike	Matrix		Rec.		RPD
Param	F C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		13500	mg/Kg	100	10000	2780	107	79.4 - 120.6	5	20
Percent recovery is based	on the spike resu	ılt. RPD	is based	l on the	spike and	spike dup	licate re	sult.		
		:								
		t .								
Matrix Spike (MS-1)	Spiked Sample	: 278382								
QC Batch: 85273		Dota	Analyz	od. 30	011-10-04			Anal	yzed By	: AR
Prep Batch: 72370			Preparat		)11-10-04				ared By	
1101 2010		1 400 4	Lopustin		,11 10 00			* * * * * * * * * * * * * * * * * * * *		
			V4G			Cniles	Mot		т	) on
Param	न	ì	MS esult	Units	Dil	Spike Amount	Mat			Rec.
	F	C R	esult	Units mg/Kg	Dil.	Amount	Res	ult Rec.	L	imit
Chloride		C R	esult 7100	mg/Kg	100	Amount 10000	725	ult Rec. 50 98	L	imit
Chloride		C Red	esult 7100	mg/Kg	100 spike and	Amount 10000 spike dup	725	ult Rec. 50 98 sult.	L	imit - 120.6
Chloride Percent recovery is based	on the spike resu	C Ro 1' nlt RPD MSD	esult 7100 is based	mg/Kg l on the	100 spike and Spike	Amount 10000 spike dup Matrix	Res 725 licate re	ult Rec. 50 98 sult.	79.4	imit - 120.6 RPD
Chloride Percent recovery is based Param		C Roult RPD MSD Result	esult 7100 is based Units	mg/Kg l on the Dil.	100 spike and Spike Amount	Amount 10000 spike dup Matrix Result	Res 725 licate re Rec.	ult Rec. 50 98 sult. Rec. Limit	79.4 RPD	imit - 120.6 RPD Limit
Chloride Percent recovery is based Param Chloride	on the spike resu	C R I' ult RPD MSD Result 17700	esult 7100 is based Units mg/Kg	mg/Kg I on the Dil. 100	spike and Spike Amount 10000	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6	79.4	imit - 120.6 RPD
Chloride Percent recovery is based Param Chloride	on the spike resu	C R I' ult RPD MSD Result 17700	esult 7100 is based Units mg/Kg	mg/Kg I on the Dil. 100	spike and Spike Amount 10000	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6	79.4 RPD	imit - 120.6 RPD Limit
Param Chloride Percent recovery is based Param Chloride Percent recovery is based	on the spike resu	C R I' ult RPD MSD Result 17700	esult 7100 is based Units mg/Kg	mg/Kg I on the Dil. 100	spike and Spike Amount 10000	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6	79.4 RPD	imit - 120.6  RPD Limit
Chloride Percent recovery is based Param Chloride	on the spike resu	C R I' ult RPD MSD Result 17700	esult 7100 is based Units mg/Kg	mg/Kg I on the Dil. 100	spike and Spike Amount 10000	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6	79.4 RPD	imit - 120.6 RPD Limit
Chloride Percent recovery is based Param Chloride Percent recovery is based	on the spike resu	C R. I'ult RPD MSD Result 17700	esult 7100 is based Units mg/Kg	mg/Kg I on the Dil. 100	spike and Spike Amount 10000	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6	79.4 RPD	imit - 120.6 RPD Limit
Chloride Percent recovery is based Param Chloride Percent recovery is based Matrix Spike (MS-1)	on the spike resu	C R. 1' 1' 1' 1' 1' 1' 1' 1' 1' 1' 1' 1' 1'	esult 7100 is based Units mg/Kg is based	mg/Kg d on the  Dil.  100 d on the	spike and Spike Amount 10000 spike and	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.	RPD 3	imit - 120.6 RPD Limit 20
Chloride Percent recovery is based Param Chloride Percent recovery is based  Matrix Spike (MS-1) QC Batch: 85274	on the spike resu	C R. 1' ult RPD MSD Result 17700 ult RPD	esult 7100 is based Units mg/Kg is based	mg/Kg I on the Dil. 100 I on the	spike and Spike Amount 10000 spike and	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.  Anal	L 79.4 RPD 3	RPD Limit 20
Chloride Percent recovery is based Param Chloride Percent recovery is based  Matrix Spike (MS-1)  QC Batch: 85274	on the spike resu	C R. 1' ult RPD MSD Result 17700 ult RPD	esult 7100 is based Units mg/Kg is based	mg/Kg I on the Dil. 100 I on the	spike and Spike Amount 10000 spike and	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.  Anal	RPD 3	RPD Limit 20
Chloride Percent recovery is based Param Chloride Percent recovery is based  Matrix Spike (MS-1) QC Batch: 85274	on the spike resu	C R. 1' ult RPD MSD Result 17700 ult RPD	esult 7100 is based Units mg/Kg is based	mg/Kg I on the Dil. 100 I on the	spike and Spike Amount 10000 spike and	Amount 10000 spike dup Matrix Result 7250	Res 725 licate res Rec. 104	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.  Anal	L 79.4 RPD 3	RPD Limit 20
Chloride Percent recovery is based Param Chloride Percent recovery is based  Matrix Spike (MS-1) QC Batch: 85274	on the spike resurrence on the spike resurrence Spiked Sample	C R. I't RPD MSD Result 17700 alt RPD  278392 Date QC F	esult 7100 is based Units mg/Kg is based Analyze Preparat	mg/Kg I on the Dil. 100 I on the	spike and Spike Amount 10000 spike and	Amount 10000 spike dup Matrix Result 7250 spike dup	Res 728 licate res Rec. 104 licate res	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.  Anal; Prepare	L 79.4 RPD 3	RPD Limit 20
Chloride Percent recovery is based Param Chloride Percent recovery is based  Matrix Spike (MS-1) QC Batch: 85274	on the spike resu	C R. I'ult RPD MSD Result 17700 alt RPD Date QC F	esult 7100 is based Units mg/Kg is based Analyze Preparat MS esult	mg/Kg I on the Dil. 100 I on the	spike and Spike Amount 10000 spike and 011-10-04 011-10-03 Dil.	Amount 10000 spike dupi Matrix Result 7250 spike dupi	Res 728 licate res Rec. 104 licate res	ult Rec. 50 98 sult.  Rec. Limit 79.4 - 120.6 sult.  Analy Preparents	RPD 3	RPD Limit 20

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

Work Order: 11092631

Page Number: 20 of 25

Report Date: October 6, 2011

Report Date: October 6, 2011

114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 21 of 25

Eddy Co., NM

			$\dot{ ext{MSD}}$			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10800	mg/Kg	100	10000	<385	108	79.4 - 120.6	7	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: 278402

QC Batch: 85275 Prep Batch: 72370 Date Analyzed: QC Preparation:

2011-10-04 2011-10-03 Analyzed By: AR Prepared By: AR

MSSpike Rec. Matrix Param F Ċ Result Units Dil. Amount Result Rec. Limit <385 Chloride 10200 mg/Kg 100 10000 102 79.4 - 120.6

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

MSD RPD Spike Matrix Rec. Param  $^{\rm C}$ Result Units Dil. Amount Result Rec. Limit RPD Limit 10700 100 10000 <385 107 79.4 - 120.6 Chloride mg/Kg 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: 278404

QC Batch: 85276 Prep Batch: 72370 Date Analyzed: 2011-10-04 QC Preparation: 2011-10-03

Analyzed By: AR Prepared By: AR

MS Spike Matrix Rec. Amount Param F Result Units Dil. Result Limit C Rec. 10200 10000 <385 79.4 - 120.6 Chloride mg/Kg 100 102

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

MSD Spike Matrix Rec. RPD F  $\mathbf{C}$ Dil. Result Param Result Units Amount Rec. Limit RPD Limit Chloride 10800 100 10000 <385 108 79.4 - 120.6 20 mg/Kg 6

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

Report Date: October 6, 2011

114-6400919

Work Order: 11092631 COG/Dodd Federal Unit Water Flood Page Number: 22 of 25

Eddy Co., NM

# Calibration Standards

Standard	(ICV-	1)
----------	-------	----

QC Batch: 85272

Date Analyzed: 2011-10-04

Analyzed By: AR

			!	ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Cert	units	Conc.	$\operatorname{Conc.}$	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-10-04

#### Standard (CCV-1)

QC Batch: 85272

Date Analyzed: 2011-10-04

Analyzed By: AR

			1	CCVs	CCVs	CCVs	Percent	
			i	$\operatorname{True}$	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Cert	$ u$ ni $\mathbf{t}$ s	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			nig/Kg	100	98.6	99	85 - 115	2011-10-04

#### Standard (ICV-1)

QC Batch: 85273

Date Analyzed: 2011-10-04

Analyzed By: AR

			!	TOW.	TCW.	TON.	D	
			l	ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	$\dot{ ext{Units}}$	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	98.8	99	85 - 115	2011-10-04

#### Standard (CCV-1)

QC Batch: 85273

Date Analyzed: 2011-10-04

Analyzed By: AR

			4	CCVs	CCVs	CCVs	Percent	
			:	True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			nig/Kg	100	101	101	85 - 115	2011-10-04

Report Date: Oc 114-6400919	ctober 6, 201	1	COG/I		er: 11092631 al Unit Water	· Flood		mber: 23 of 25 Eddy Co., NM
Standard (ICV	<b>7-1</b> )							
QC Batch: 852	74		Date A	nalyzed:	2011-10-04		Analy	zed By: AR
Param Chloride	Flag	Cert	Units mg/Kg	ICVs True Conc.	ICVs Found Conc. 99.5	ICVs Percent Recovery 100	Percent Recovery Limits 85 - 115	Date Analyzed 2011-10-04
Standard (CCV	•		Data A	polygod	2011-10-04		Analy	god Byy AD
QC Batch: 8527	74		Date A	v			Anaiy	zed By: AR
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride	1 100		mg/Kg	100	101	101	85 - 115	2011-10-04
Standard (ICV QC Batch: 8527 Param Chloride	ŕ	Cert	Date A Units mg/Kg	ICVs True Conc.	2011-10-04 ICVs Found Conc. 101	ICVs Percent Recovery 101	Analy Percent Recovery Limits 85 - 115	Date Analyzed 2011-10-04
Standard (CCV QC Batch: 8527	•		Date A	.nalyzed:	2011-10-04		Analy	zed By: AR
			1	CCVs	CCVs	CCVs	Percent	
D	TV.	<b>a</b> .	 	True	Found	Percent	Recovery	Date
Param Chloride	Flag	Cert	Units mg/Kg	Conc. 100	Conc. 99.5	Recovery 100	Limits 85 - 115	Analyzed 2011-10-04
Standard (ICV QC Batch: 8527	•				2011-10-04		Analy	zed By: AR

Report Date: October 6, 2011 Page Number: 24 of 25 Work Order: 11092631 Eddy Co., NM 114-6400919 COG/Dodd Federal Unit Water Flood **ICVs ICVs** ICVsPercent True Found Percent Recovery Date Param Flag Cert Units Limits Analyzed Conc. Conc. Recovery

100

99.7

100

Standard (CCV-1)

Chloride

QC Batch: 85276

Date Analyzed: 2011-10-04

mg/Kg

Analyzed By: AR

2011-10-04

85 - 115

CCVsCCVsCCVsPercent Percent True Found Recovery Date Param Flag Cert Units Conc. Conc. Recovery Limits Analyzed 85 - 115 2011-10-04 Chloride mg/Kg 100 100 100

Page Number: 25 of 25 Eddy Co., NM

# **Appendix**

### **Laboratory Certifications**

	Certifying	Certification	Laboratory
$\mathbf{C}$	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
_	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

### Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
  - U The analyte is not detected above the SDL

#### Attachments

The scanned attachments will follow this page.

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

WO #: 11092631 Analysis Request of Chain of Custody Record PAGE: ANALYSIS REQUEST (Circle or Specify Method No.) TETRA TECH (Ext. to C35) S S 1910 N. Big Spring St. 운 운 Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946 TX1005 CLIENT NAME: SITE MANAGER: PRESERVATIVE COG Ike Tavarez **METHOD** PROJECT NAME: TPH 8015 MOD. PROJECT NO.: Dodd Federal Water Flood 114-6400919 FILTERED ( HCL HNO3 Eddy Co., NM MATRIX COMP. GRAB LAB I.D. DATE TIME SAMPLE IDENTIFICATION NUMBER 2011 9/23 178367 BH-1 368 369 370 10' 37 25' 30' 374 40 Date: 9/26/# SAMPLED BY: (Print & Initial) Date: 9/26/11 Time:

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

RECEIVED BY: (Signature)

RECEIVED BY: (Signature)

Date:

Time:

Date:

Time.

SAMPLE SHIPPED BY: (Circle)

TETRA TECH CONTACT PERSON:

Ike Taxarez

HAND DELIVERED

AIRBILL#

Results by:

RUSH Charges

OTHER:

Date:

Time:

Date:

REMARKS:

TRAVE

RELINQUISHED BY: (Signature)

RELINQUISHED BY: (Signature)

SAMPLE CONDITION WHEN RECEIVED:

RECEIVING LABORATORY:

CONTACT:

Wo#: 11092631

Analysis Request of Ch	PAGE: 2 OF: 4	
	ANALYSIS REQUEST (Circle or Specify Method No.)	
TETRA 1910 N. Big Midland, Te. (432) 682-4559	Spring St.	5 (Ext. to C35) d Cr Pb Hg Se d Vr Pd Hg Se TDS
CLIENT NAME: SITE MANAGI	Tawez PRESERVATIV	As Ba Cd Cr As Ba Cd Vr As Ba Cd Vr B260/624 B270/625 ions, pH, TDS
PROJECT NO.: PROJECT NAME:  119-6-100919 Doctor Federal W	Inter Flood	8021B 8015 MOD. 270 Metals Ag As Metals Ag As Metals Ag As Metals Ag Berni Volatiles Semi Volatiles Semi Vol. 8240/826 Semi Vol. 827 8080/608 a Spec. Beta (Air) Asbestos) Anions/Cation
LAB I.D. DATE TIME WAILBING SAMP	Taure Preservative METHOD  Valer Flood  Co., NM  LE IDENTIFICATION  NONE  LICE   BTEX 8021B TPH 8015 MOD. TX10 PAH 8270 RCRA Metals Ag As Ba C TCLP Volatiles TCLP Volatiles TCLP Semi Volatiles RCI GC.MS Vol. 8240/8260/624 GC.MS Semi. Vol. 8270/629 PCB's 8080/608 Poct's 8080/608 PCB's 8080/608	
278377 9/23 S X BH-1 50'	I- X -	
378 / / / 60'		
379 70'		
380 80'		
381 BH-2 0-1		
382 \ \ \ \ \ \ 3'		
383 \ \ \ \ \ \ 5'		
384 7'		
385 / 10'		
386////////////////////////////////////		
RELINOUSAED BY: (Signature)  Date: 1700   17	RECEIVED BY (Signature)  Date: 1/0/	SAMPLED BY: (Print & Initial) Find Date: 9/25/11
RELINQUISHED BY: (Signature)  Date: Time:	PRECEIVED BY: (Signature)  Date:  Time:	SAMPLE SHIPPED BY: (Circle)  FEDEX BUS  HAND DELIVERED USS  OTHER:
RELINQUISHED BY: (Signature)  Date: Time:	RECEIVED BY: (Signature)  Date:  Time:	TETRA TECH CONTACT PERSON: Results by:
RECEIVING LABORATORY: TRACE ADDRESS: CITY: MIDCAMS STATE: TX ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature)  DATE:	Ike Taxave 2  RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: REMARKS:		

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

WO#: 11092631

Analysis Request of Chain of Custody Record										PA	GE:		3		OF:		4				
7 and year of the						-				(				S RE			No.)				
1910 N. Big Midland, Te							5 (Ext. to C35)	Cr Pb Ha	Vr Pd									SU			
CLIENT NAME: SITE MANAGE THE	ER: SHAWERS			SER	VATIVE IOD		TX1005	Ba Cd	Ba			60/624	8270/625					40			
	Water Flood	(N)				_	. MOD	Is Ag As	9	sel	Volatiles	8240/82	i. Vol. 8	809/	g	ပ္ထ	(Air)	stos)			
	Water Flood  Co., NM  PLE IDENTIFICATION  SHAME  ON THE PROOF OF THE P	FILTERED (	HNO3	ICE	NONE	BTEX 8021B	TPH 8015	RCRA Metals	TCLP Metals Ag	TCLP Volatiles	TCLP Semi Volatiles	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8	PCB's 8080/6	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos) Maior Anions/Catlons			
278387 9/23 S X BH-2 20'	·			X											X						
388 / / 1 25															X						
389 30'	1														$ \rangle$						
390 40'	[1]			$\prod$											χ						
391 \ 50'															X						
392 60'	1														$ \rangle$						
393 \ BH-3 0-1	1																				
394 / 3'	1																				
395 / 5'	I.																				
396 // // // 7:	1				6																
RELINQUISHED BY: (Signature)  Date: 1/25/11  Time: L*100	RECEIVED BY Signature)		Date: Time:		02.001 15.11		_];	SAMP	LED E	3Y: (P	rint &	Initial)	1	\in	1		Dat Tîm	e:	7/20	5/11	
RELINQUISHED BY: (Signature)  Date:  Time:	BY: (Signature)		Date: Time:		·		_	SAMP		IIPPE	D BY:	(Circl					AIRBI	-			
RELINQUISHED BY: (Signature)  Date:	RECEIVED BY: (Signature)		Date:				_ {		D DE		NTAC	UP					THE	R: Result	o hu:		=
RECEIVING LABORATORY: TRACE	RECEIVED BY: (Signature)		Time:		<u> </u>									•			L		Charg		
ADDRESS: CITY: MIDLAWO STATE: TX ZIP: CONTACT: PHONE:	DATE: TIME	 IE:					_	1	Ke	7	avo	vc=	۳				ľ	luthoi Ye:	ized:	les No	,
SAMPLE CONDITION WHEN RECEIVED: REMARKS:  13 Cintact Please fill out all copies - Laboratory retains Yello	w copy - Return Orginal copy to Take Tec	ch -	Proi	ect i	Manan	er m	taine	Pink	COT	OV -	Acc	cour	tine	rec	eives	Go	d cr	DOV.			

Analysis Request of Chain of Custody Record PAGE: OF: **ANALYSIS REQUEST** (Circle or Specify Method No.) TETRA TECH 8 8 (Ext. to C35) 1910 N. Big Spring St. Pb Hg Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946 ঠ ַּ TX1005 B SITE MANAGER: CLIENT NAME: PRESERVATIVE Ba Ike Taxarez METHOD TCLP Metals Ag As TPH 8015 MOD. PROJECT NAME: PROJECT NO .: NUMBER OF CONT FILTERED (Y/N) HCL HNO3 Oold Federal Water Flood 114-6400919 LAB I.D. COMP. GRAB IOE NONE DATE TIME SAMPLE IDENTIFICATION NUMBER 2011 10' BH-3 278397 15 398 20' 399 400 401 402 40' 50' 403 60' 404 RELINQUISHED BY: (Signature SAMPLED BY: (Print & Initial) Date: -9/26/1/ RELINQUISHED BY: (Signature

SAMPLE SHIPPED BY: (Circle) ECEDIED BY: (Signature) Date: AIRBILL #: Time: AND DELIVERED OTHER: RELINQUISHED BY: (Signature) RECEIVED BY: (Signature) Date: TETRA TECH CONTACT PERSON: Results by: RECEIVING LABORATORY: \_ RECEIVED BY: (Signature) RUSH Charges IKC Tawer CITY: MIDLAND STATE: 77 ZIP: DATE: TIME: No SAMPLE CONDITION WHEN RECEIVED: REMARKS Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Work Order: 12041320 Report Date: April 18, 2012

# Summary Report

Ike Tavarez

Tetra Tech

1910 N. Big Spring Street

Midland, TX 79705

Report Date: April 18, 2012

Page Number: 1 of 3

Work Order: 12041320

Project Location: Eddy Co., NM

Project Name:

COG/Dodd Federal Unit Water Flood

Project Number: 114-6400919

			Date	$_{ m Time}$	Date
Sample	Description	Matrix	Taken	$\mathbf{Taken}$	Received
294206	CS-1 Sidewall (AH-4)	soil	2012-04-03	00:00	2012-04-13
294207	CS-2 Sidewall (AH-4)	soil	2012-04-03	00:00	2012-04-13
294208	CS-3 Sidewall (AH-4)	soil	2012-04-02	00:00	2012-04-13
294209	CS-4 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294210	CS-5 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294211	CS-6 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294212	CS-7 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294213	CS-8 Sidewall (AH-2)	soil	2012-04-03	00:00	2012-04-13
294214	CS-9 Sidewall (AH-2)	soil	2012-04-02	00:00	2012-04-13
294215	CS-10 Sidewall (AH-2)	soil	2012-04-02	00:00	2012-04-13
294216	CS-13 Sidewall (AH-1)	soil	2012-04-03	00:00	2012-04-13
294217	CS-14 Sidewall (AH-1)	soil	2012-04-03	00:00	2012-04-13
294218	CS-11 Sidewall (AH-1)	soil	2012-04-02	00:00	2012-04-13
294219	CS-12 Sidewall (AH-1)	soil	2012-04-02	00:00	2012-04-13

Sample: 294206 - CS-1 Sidewall (AH-4)

Param	Flag	Result	$\operatorname{Units}$	RL
Chloride		<200	mg/Kg	4

Sample: 294207 - CS-2 Sidewall (AH-4)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Report Date: Apr	ril 18, 2012	Work Order: 12041320	Page î	Number: 2 of 3
Sample: 294208	8 - CS-3 Sidewall (AH-4)			
Param	$\operatorname{Flag}$	Result	Units	RL
Chloride		14300	mg/Kg	4
Sample: 294209	9 - CS-4 Sidewall (AH-3)			
Param	Flag	Result	Units	RL
Chloride		546	mg/Kg	4
Sample: 294210	0 - CS-5 Sidewall (AH-3)			
Param	Flag	Result	Units	RL
Chloride		565	mg/Kg	4
Sample: 294211	1 - CS-6 Sidewall (AH-3)			
Param	Flag	Result	Units	RL
Chloride		682	mg/Kg	4
Sample: 294212	2 - CS-7 Sidewall (AH-3)			
Param	Flag	Result	Units	RL
Chloride		26500	mg/Kg	4
Sample: 294213	3 - CS-8 Sidewall (AH-2)			
Sample: 294213 Param	3 - CS-8 Sidewall (AH-2)	Result	Units	RL
		. Result 585	Units mg/Kg	RL 4
Param Chloride				
Param Chloride Sample: 294214	Flag 4 - CS-9 Sidewall (AH-2)	585	nıg/Kg	4
Param Chloride	Flag			
Param Chloride  Sample: 294214  Param Chloride	Flag 4 - CS-9 Sidewall (AH-2)	585 Result	mg/Kg Units	4 RL
Param Chloride  Sample: 294214  Param Chloride	Flag 4 - CS-9 Sidewall (AH-2) Flag	585 Result	mg/Kg Units	4 RL

Report Date: Apri	l 18, 2012	Work Order: 12041320	Page I	Page Number: 3 of 3	
Sample: 294216	- CS-13 Sidewall (AH	-1)			
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4	
Sample: 294217	- CS-14 Sidewall (AH	-1)			
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4	
Sample: 294218	- CS-11 Sidewall (AH	-1)			
Param	Flag	Result	Units	RL	
Chloride		15200	mg/Kg	4	
Sample: 294219	- CS-12 Sidewall (AH	-1)			
Param	Flag	Result	Units	RL	
Chloride		24600	mg/Kg	4	



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

Texas 79424 Lubbock. Texas 79922 El Paso. Midland. Texas 79703 800-378-1298 806-794-1296 915-585-3443 432 - 689 - 6301 FAX 808 - 794 - 1298 FAX 915 -585 -4944 FAX 432 - 689 - 6313

(BioAquatic) 2501 Mayes Rd., Suite 100

Carrolton. Texas 75006 972-242-7750

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

### Certifications

HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

### Analytical and Quality Control Report

Ike Tavarez

Tetra Tech

1910 N. Big Spring Street

Midland, TX, 79705

Report Date: April 18, 2012

Work Order: 12041320

Project Location: Eddy Co., NM

Project Name: COG/Dodd Federal Unit Water Flood

114-6400919 Project Number:

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

210102000 010	tile illing took response and quality	<b>.</b>	Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
294206	CS-1 Sidewall (AH-4)	soil	2012-04-03	00:00	2012-04-13
294207	CS-2 Sidewall (AH-4)	soil	2012-04-03	00:00	2012-04-13
294208	CS-3 Sidewall (AH-4)	soil	2012-04-02	00:00	2012-04-13
294209	CS-4 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294210	CS-5 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294211	CS-6 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294212	CS-7 Sidewall (AH-3)	soil	2012-04-02	00:00	2012-04-13
294213	CS-8 Sidewall (AH-2)	soil	2012-04-03	00:00	2012-04-13
294214	CS-9 Sidewall (AH-2)	soil	2012-04-02	00:00	2012-04-13
294215	CS-10 Sidewall (AH-2)	soil	2012-04-02	00:00	2012-04-13
294216	CS-13 Sidewall (AH-1)	soil	2012-04-03	00:00	2012-04-13
294217	CS-14 Sidewall (AH-1)	soil	2012-04-03	00:00	2012-04-13
294218	CS-11 Sidewall (AH-1)	soil	2012-04-02	00:00	2012-04-13
294219	CS-12 Sidewall (AH-1)	soil	2012-04-02	00:00	2012-04-13

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 14 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

# Report Contents

Case Narrative	4
Analytical Report	5
Sample 294206 (CS-1 Sidewall (AH-4))	Ę
Sample 294207 (CS-2 Sidewall (AH-4))	Ę
Sample 294208 (CS-3 Sidewall (AH-4))	Ę.
Sample 294209 (CS-4 Sidewall (AH-3))	Ę
Sample 294210 (CS-5 Sidewall (AH-3))	€
Sample 294211 (CS-6 Sidewall (AH-3))	6
Sample 294212 (CS-7 Sidewall (AH-3))	$\epsilon$
Sample 294213 (CS-8 Sidewall (AH-2))	7
Sample 294214 (CS-9 Sidewall (AH-2))	7
Sample 294215 (CS-10 Sidewall (AH-2))	7
Sample 294216 (CS-13 Sidewall (AH-1))	7
Sample 294217 (CS-14 Sidewall (AH-1))	
Sample 294218 (CS-11 Sidewall (AH-1))	8
Sample 294219 (CS-12 Sidewall (AH-1))	
Method Blanks	10
QC Batch 90251 - Method Blank (1)	10
QC Batch 90252 - Method Blank (1)	
Laboratory Control Spikes	11
QC Batch 90251 - LCS (1)	11
QC Batch 90252 - LCS (1)	
QC Batch 90251 - MS (1)	
QC Batch 90252 - MS (1)	
Calibration Standards	13
QC Batch 90251 - ICV (1)	
QC Batch 90251 - CCV (1)	
QC Batch 90252 - ICV (1)	
QC Batch 90252 - CCV (1)	13
Appendix	14
Report Definitions	14
Laboratory Certifications	
Standard Flags	14
Attachments	14

### Case Narrative

Samples for project COG/Dodd Federal Unit Water Flood were received by TraceAnalysis, Inc. on 2012-04-13 and assigned to work order 12041320. Samples for work order 12041320 were received intact at a temperature of 12.1 C. Samples were received on ice.

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

		$\operatorname{Prep}$	$\operatorname{Prep}$	$_{ m QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	76585	2012-04-13 at 12:07	90251	2012-04-16 at 12:08
Chloride (Titration)	SM 4500-Cl B	76585	2012-04-13 at 12:07	90252	2012-04-16 at 12:09

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 12041320 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.

114-6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 5 of 14 Eddy Co., NM

## **Analytical Report**

Sample: 294206 - CS-1 Sidewall (AH-4)

Laboratory: Midland

Prep Batch:

Chloride (Titration) Analysis: QC Batch: 90251 76585

SM 4500-Cl B Analytical Method: Date Analyzed: 2012-04-16 Sample Preparation: 2012-04-13

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

RLDilution RLFlag Cert Result Units Parameter 4.00 Chloride <200 mg/Kg 50 Ų

Sample: 294207 - CS-2 Sidewall (AH-4)

Laboratory: Midland

Prep Batch:

Chloride (Titration) Analysis: QC Batch: 90251 76585

Analytical Method: SM 4500-Cl B Date Analyzed: 2012-04-16 Sample Preparation: 2012-04-13

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

RLRLDilution Parameter Flag Cert Result Units 4.00 50 Chloride <200 mg/Kg

Sample: 294208 - CS-3 Sidewall (AH-4)

Laboratory: Midland

Chloride (Titration) Analysis: QC Batch: 90251 Prep Batch: 76585

Analytical Method: SM 4500-Cl B Date Analyzed: 2012-04-16 Sample Preparation: 2012-04-13

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

RLDilution RLParameter Flag Cert Result Units Chloride 14300 100 4.00 mg/Kg

114-6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 6 of 14

Eddy Co., NM

Sample: 294209 - CS-4 Sidewall (AH-3)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: 90251 Prep Batch: 76585 Date Analyzed: Sample Preparation:

2012-04-16 2012-04-13

Analyzed By: ARPrepared By: AR

RL

Parameter Chloride

Flag Cert Result Units 546 mg/Kg Dilution RL50 4.00

Sample: 294210 - CS-5 Sidewall (AH-3)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-04-16

Prep Method: N/A

QC Batch: Prep Batch: 90251

Sample Preparation: 2012-04-13 Analyzed By: AR

76585

Prepared By:

50

AR

Parameter Chloride

RLFlag Cert Result 565

Units mg/Kg Dilution

RL4.00

RL

4.00

Sample: 294211 - CS-6 Sidewall (AH-3)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

90251 76585 Date Analyzed: Sample Preparation:

2012-04-16 2012-04-13

Analyzed By: AR.

Cert

Prepared By: AR.

Parameter Chloride

Flag

RLResult  $\overline{682}$ 

Units mg/Kg

Dilution

50

Sample: 294212 - CS-7 Sidewall (AH-3)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B

Prep Method: N/A Analyzed By:

QC Batch: Prep Batch:

90251 76585

Sample Preparation:

2012-04-16 2012-04-13

AR. Prepared By: AR

Report Date 114-6400919	e: April 18, 2012		k Order: 1204 Federal Unit		Page Number: 7 of 14 Eddy Co., NM			
Parameter	Flag	Cert	RL Result	Units	Dilution	RL		
Chloride			26500	mg/Kg	100	4.00		
Sample: 29 Laboratory: Analysis:	4213 - CS-8 Sidewall (AH- Midland Chloride (Titration)	,	cal Method:	SM 4500-Cl B	Prep Method:	N/A		
QC Batch:	90251	Date Ar		2012-04-16	Analyzed By:	AR		
Prep Batch:	76585	Sample	Preparation:	2012-04-13	Prepared By:	AR		
			RL					
Parameter	Flag	Cert	Result	Units	Dilution	RL		
Chloride			585	mg/Kg	50	4.00		
Sample: 29 Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 90252 76585	Analytic Date Ar	Preparation:	SM 4500-Cl B 2012-04-16 2012-04-13	Prep Method: Analyzed By: Prepared By:	N/A AR AR		
Parameter	Flag	Cert	RL Result	Tinita	Dilution	ĎΙ		
Chloride	riag	Cert	7450	Units mg/Kg	100	$\frac{RL}{4.00}$		
Sample: 29 Laboratory: Analysis: QC Batch: Prep Batch:	<b>4215 - CS-10 Sidewall (AF</b> Midland Chloride (Titration) 90252 76585	Analytic Date An	cal Method: nalyzed: Preparation: RL	SM 4500-Cl B 2012-04-16 2012-04-13	Prep Method: Analyzed By: Prepared By:	N/A AR AR		
Parameter	Flag	Cert	Result	Units	Dilution	RL		
Chloride	······································		604	mg/Kg	50	4.00		

 $\frac{\dot{P}arameter}{Chloride}$ 

50

Unitsmg/Kg

604

4.00

114-6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 8 of 14

Eddy Co., NM

Sample: 294216 - CS-13 Sidewall (AH-1)

Laboratory:

Midland

Chloride (Titration) Analysis:

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

90252

Date Analyzed:

Cert

Cert

2012-04-16

Analyzed By: AR

Prep Batch:

76585

Sample Preparation:

2012-04-13

Prepared By: AR

RL

Parameter Flag Chloride υ

Result <200

Units mg/Kg Dilution 50

RL4.00

Sample: 294217 - CS-14 Sidewall (AH-1)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

90252

Date Analyzed:

2012-04-16

Analyzed By: AR

Prep Batch:

76585

Sample Preparation: 2012-04-13 Prepared By: AR

RL

Parameter Flag Chloride U

Result <200

Units mg/Kg

Dilution 50

RL4.00

Sample: 294218 - CS-11 Sidewall (AH-1)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

90252 76585 Date Analyzed: Sample Preparation:

2012-04-16 2012-04-13 Analyzed By: AR. AR.

Prepared By:

RL

Parameter Flag Cert Result Units Dilution RLChloride 15200 mg/Kg 100 4.00

Sample: 294219 - CS-12 Sidewall (AH-1)

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By:

QC Batch:

76585

90252

Date Analyzed:

2012-04-16

AR.

Prep Batch:

Sample Preparation:

2012-04-13

Prepared By:

AR

Report Date: April 18, 2012 114-6400919

Work Order: 12041320

COG/Dodd Federal Unit Water Flood

Page Number: 9 of 14 Eddy Co., NM

		į	RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			24600	mg/Kg	100	4.00

114-6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 10 of 14

Eddy Co., NM

## Method Blanks

Method Blank (1)

QC Batch: 90251

QC Batch: Prep Batch:

90251 76585

2012-04-16

Date Analyzed: QC Preparation: 2012-04-13 Analyzed By: AR

Prepared By: AR

Parameter Chloride

Flag

Cert

MDL Result < 3.85

Units mg/Kg RL4

Method Blank (1)

QC Batch: 90252

QC Batch: Prep Batch: 76585

90252

Date Analyzed: QC Preparation:

2012-04-16 2012-04-13 Analyzed By: AR.

Prepared By: AR.

Parameter Chloride

Flag

Cert

MDL Result < 3.85

Units mg/Kg RL4

114-6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 11 of 14

Eddy Co., NM

# Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:

90251

Date Analyzed:

2012-04-16

Analyzed By: AR

Prep Batch: 76585

QC Preparation: 2012-04-13

Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride			99.0	ıng/Kg	1	100	< 3.85	99	85 - 115

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

			LCSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	F	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			100	mg/Kg	1	100	< 3.85	100	85 - 115	1	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:

90252 Prep Batch: 76585 Date Analyzed:

2012-04-16

Analyzed By: AR.

Prepared By: AR

		,	LCS			Spike	Matrix		Rec.
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride		i	98.4	nıg/Kg	1	100	< 3.85	98	85 - 115

QC Preparation: 2012-04-13

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			100	mg/Kg	1	100	< 3.85	100	85 - 115	2	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: 294213

QC Batch: Prep Batch: 76585

Date Analyzed: 2012-04-16 QC Preparation: 2012-04-13 Analyzed By: AR Prepared By: AR

114-6400919

Work Order: 12041320

COG/Dodd Federal Unit Water Flood

Page Number: 12 of 14

Eddy Co., NM

Param	F	Ċ	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10200	mg/Kg	100	10000	585	96	79.4 - 120.6

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

			MSD			$\operatorname{Spike}$	Matrix		Rec.		RPD
Param	$\mathbf{F}$	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$_{ m Limit}$
Chloride			10400	mg/Kg	100	10000	585	98	79.4 - 120.6	2	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: 294219

QC Batch: 90252

Date Analyzed:

2012-04-16

Analyzed By: AR Prepared By: AR

Prep Batch: 76585

QC Preparation:

2012-04-13

		;	MS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$\mathbf{C}_{t}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride		i	33700	mg/Kg	100	10000	24600	91	79.4 - 120.6

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

			MSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	$\mathbf{F}$	C	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$	RPD	$_{ m Limit}$
Chloride			34200	mg/Kg	100	10000	24600	96	79.4 - 120.6	2	20

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

114 - 6400919

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 13 of 14

Eddy Co., NM

## Calibration Standards

Standard (	(ICV-1)
------------	---------

QC Batch: 90251

Date Analyzed: 2012-04-16

Analyzed By: AR

				ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		•	mg/Kg	100	99.9	100	85 - 115	2012-04-16

#### Standard (CCV-1)

QC Batch: 90251

Date Analyzed: 2012-04-16

Analyzed By: AR

			1 1 1	CCVs	CCVs	CCVs	Percent	
			I .	True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2012-04-16

#### Standard (ICV-1)

QC Batch: 90252

Date Analyzed: 2012-04-16

Analyzed By: AR.

			Į.	ICVs	<b>ICVs</b>	<b>ICVs</b>	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-04-16

#### Standard (CCV-1)

QC Batch: 90252

Date Analyzed: 2012-04-16

Analyzed By: AR

			:	CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2012-04-16

Work Order: 12041320 COG/Dodd Federal Unit Water Flood Page Number: 14 of 14

Eddy Co., NM

Appendix

114-6400919

### Report Definitions

Report Date: April 18, 2012

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

### **Laboratory Certifications**

	Certifying	Certification	Laboratory
$\mathbf{C}$	Authority	Number	Location
_	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

### Standard Flags

F	Description
Τ.	Describeron

- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

#### Attachments

The scanned attachments will follow this page.

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

Analysis Request of Chain of Custody Record -							PAGE: OF: 2  ANALYSIS REQUEST																								
												(Cii				RE-	-		Vo.)												
TETRA TECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946									5 (Ext. to C35)	Cr Pb	Vr Pd Hg									SOL											
CLIENT NAI	NE:	(	O G				SITE MANAGI Ike T	R: Ovarez		NERS			SER	VATI HOD	VE		TX1005	ag	Ba Cd			60/624	270/625					ns, pH,			
PROJECT N	10.: 40d	919	7	PR	OJI	ECT D	NAME:		Flood	CONTAI	<u>R</u>						MOD.	s Ag As	s Ag As	Volatiles		8240/82	ii. Vol. 8:	809		ပ္ထဲ	(Air)	tos, s/Cation			
LAB I.D. NUMBER	DAT	l		MATRIX	COMP.	GRAB	SAMP	PNIT WOTER ! COUNTY) LE IDENTIFICATION		NUMBER OF CONTAINERS	FILTERED (Y/N)	HNO3	IQE	NONE		BTEX 8021B	TPH 8015 PAH 8270	RCRA Metals Ag	TCLP Metals Ag	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Sem	PCB's 8080/608 Pest, 808/608	Chloride	<b>Gamma Spec.</b>	Alpha Beta (Air)	PLM (ASDestos) Major Anions/Cations, pH, TDS			
274206	4/3/	2		S		X	CS-1 Sidewal	<i>y</i>	(AH-4)	1			X												X						
267	4/3/	2		S	- 1		CS-2 Sidewo		A 4-4	1			χ												X						
208	4/2/1	ı		S			CS-3 sidewo		AH-4	ı			X												X						
209				s	- 1		CS-4 sidewa		(AH-78)3	j			X							$oldsymbol{\perp}$					X						
210				5			CS-5 sidewa		(AH-3)	1			X							_					X						
211				5	l		CS-6 Sidewa		(AH-3)			L	X												X					Ш	
212	w			5		״	CS-7 sidewo	)	(AH-3)	1			X				$\perp$								X						
213	4/3/	2		5		χ	CS-8 sideme	1/	(AH-2)				X									Ц			X		┙				
見日	4/2	In		5		X	CS-9 Sidena	<u> </u>	(AH-2)				X												X						
215	•			s		X	CS-10, Sidew	011 000	(AH-2)	1			X	بريا						L					X			ليل	141		
RELINGUISHED				<u>U</u>			Time: 500	RECEIVED BY: (Signature)				Date Time		₩.	\$ <i>l</i> ç÷	-	s	Brit	D BY	Serior Se	che Che	itial) ave	ح	B	05		Date Tim	e: na	20		
RELINGUISHIED BY: (Shipature)  Date: 4 A 6 1 C RE-EIVED BY: (Shipature)  Time: 1 C P IV							13	1/2			FEDE				BUS					URBIL OTHER	_			-							
RELINQUISAEO BY (Signature)  Date:											DELIV			UPS PERS				_		esults	by:		ᅴ								
RECEIVING LABORATORY: RECEIVED BY: (Signature)  ADDRESS:										th	æ	Tov	/Q-T <	1					Ā	USH C	harae	s	$\dashv$								
CITY:									.										I <sup>A</sup>	uthoriz Yes	ed: ¯	No									
SAMPLE CONDITION WHEN RECEIVED: REMARKS:  2. Valant alters Midland																															
	Plea	se f	ill out all d	copi	es	- L	aboratory retains Yellov	v copy - Return Orgin	al copy to Tetr	a Tec	h -	Pro	ject	Mana	ager	reta	ins F	ink (	ору	- A	ccc	ounti	ing i	rece	ives	Goi	d co	ру.			أست

Analysis Request of Chain of Custody Record								PAGE: 2 OF: 2												
								ANALYSIS REQUEST (Circle or Specify Method No.)												
TETRATECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946						1 1	TX1005 (Ext. to C35)	Ö	Pd Hg									TDS		
LIENT NAME: COG SITE MANAGER:  The Tavalet  PRESERVATIVE METHOD									As Ba C			260/624	270/625					ns, pH,		
PROJECT NO.: PROJECT NAME: 114-6400919 Dodd Federal Unit Water Flood (Edd) County)	CONTA	П				_	8015 MOD.		8	Volatile	0	8240/82	ni. Vol. 8	809/		96.	stos)	ns/Catlo		
LAB I.D. DATE TIME XX BY SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS FILTERED (Y/N)	HCL	HNO3	ICE NONE		,~,	TPH 801	RCRA Metals Ag	TCLP Metals Ag	TCLP Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Sen	PCB's 8080/608 Pest. 808/608	Chloride	Gamma Sp	PLM (Asbestos)	Major Anions/Catlons, pH, TDS		
216 4/3/n 5 X CS-13 sidewall (AH-1)	1			χ											X					
218 J S X CS-14 Sidewall (AH-1)				x L	$oldsymbol{\perp}$						$oldsymbol{\perp}$	Ц	$\perp$	1	X			Ц		
218 1/2 3 X CS-11 sidewall (AH-1)	Ш														X	_	$\perp$	Ш	$\perp$	
219 V2 S X CS-12 s: down11 (AH-1)	Ш												$\perp$		X		$\perp$		$\perp$	
																			$\perp$	
				$\perp$						1							_			
							$\perp$					Ц						Ц		
											$oldsymbol{\perp}$	Ш						Ц		
RELINQUISMED BY: JBignatura Date: 4/6/12 RECEIVED BY: (Signature)			ite:	4	<i>F 1</i>	Z			ED BY	400	200						Date:		( to	
RELINIOUSHED BY: (Signature)  Date: 4/0/11 RECEPTED BY: (Signature)  RELINIOUSHED BY: (Signature)  Date: 4/0/11 RECEPTED BY: (Signature)  Time: 102 P		Tii Da	ne:		इंग्री अर्	<u></u>	S	AMPL FEDE	E SHII X	PPED	<i>Бс)</i> Ву: (	Circle BUS	)			Al	<i>Time:</i> RBILL	#:	40	
RELINGUISHED BY: (Signature)  Date: RECEIVED BY: (Signature)  Time: Time:							-   Ti	ETRA	TECH	CON	TACT	PERS					Re	suits b	y:	
ECEIVING LABORATORY: RECEIVED BY: (Signature)  DDRESS: ITY: STATE: ZIP:							-	L	ke Ta	<b>√</b> ¢^	ez						RU	JSH Cr thorize Yes	arges d:	No
CONTACT: PHONE: DATE: TIME:  SAMPLE CONDITION WHEN RECEIVED: REMARKS:										, -	Acc	ount	ina :	recei	ives	Gold	Cor			710