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

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

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

## HOBBS OCD

Form C-141 Revised August 8, 2011

FFR 1 2 2014 Subjinit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

RECEIVED

			Rele	ease Notific	ation	and Co	rrective A	ctio	n			
						OPERA'	ГOR		☐ Initia	al Report	$\boxtimes$	Final Repo
Name of Co						Contact Bru						
Address PC							No. (432) 631-6	982				
Facility Na	me H Corr	igan Battery		***		Facility Typ	e Tank Battery		•			
Surface Ow	ner Priscil	la Brunson l	Moody	Mineral C	)wner					.30-625		
				LOCA	TIOI	OF RE	LEASE Non	RVRES	21 MEST	. H COR	ile (U	io ha.
Unit Letter	Section	Township	Range	Feet from the		South Line	Feet from the 1,524 ft	East/	West Line FEL	County	_	
G	4	228	37E	1,351 ft		FNL		Lea				
	<del>}</del>		Latitude	32°25'27.77	)"N	Longitude	103°9'51.60	51"W_				
				NAT	URE	OF RELI	EASE					
Type of Rele	ase Produ	iced Water				Volume of Release 120 barrels Volume Recovered 110 barrels						
Source of Re	lease Produ	iced Water Ta	ınk			Date and H 5/10/13	lour of Occurrent	e	Date and 5/10/13	Hour of Dis	covery	
Was Immedia	ate Notice C					If YES, To			10/10/15			
			Yes [	No Not Re	equired		ng, NMOCD					
By Whom? X Was a Water							lour 5/10/13 lume Impacting	ho Wa	torgourge			
was a water	course Reac		Yes 🛛	No		11 1153, VC	itune impacung	шс на	icicourse.			
If a Watercourse was Impacted, Describe Fully.*								DTU	J= 115	-1		
caused the rele	ase of 120 ba samples were	rrels of produce taken to a com	ed water. Va mercial lab	Taken.* The pro- action trucks were coratory for analysis.	called to	the site and rec	overed a total of 11	0 barrel	s. The site wa	s field sample	ed at the	surface and
personnel arriv RECS personn- standards. Gas were below reg yards of contar tested for chlor detect. A total chloride value backfilled and surface sample and the center returned chloric samples for bot center augur per	ed at the site et sampled the soline Range of pulatory stand on innated soil wides and orga of 48 yards contoured to field data an point between the soline	beginning on Ne release in 5 p Organics (GRO lards except for yas taken to a N unic vapors. The of caliche was in g. Clean, impo- the surrounding d requested that on the tanks were ow regulatory s ts were non-det yalues below re	May 10th, 20 daces and to be cardings repeated to the cardings of the cardinal state of	en.* A total of 9, 13. Apache had alrook the samples to a ctumed non-detect the had a DRO readin proved facility for d as then taken to a c the site to serve as b was imported to the inside the battery, sughest points within reed for depth. Repruting at 2 ft bgs. The amples for the sout	eady rem commerce except fo g of 5,71 isposal. ommerci ackfill. e site by inface sau the batter esentativ ne catter heast aug	oved the contained the contained aboratory of the 4, which it of the contained aboratory and a sample of the Apache to service the contained aboratory and a samples were taked by be augured to e samples were augur point return point returns.	minated gravel in the for analysis. All 5 eturned a value of reclease area outside etwas completed, and retuned a chloride imported caliche version and field tested to determine the depetaken to a commer under chloride valued values below regular.	ne batter samples 1,070 m the bat 6 point e value was take pasture for chlor th of co- rcial lab- les belorgulatory	y and replace returned chlo g/kg. Diesed letery was scrap bottom compe of 63.7 mg/kg in to a comme area. The leadides. On July intaminants. To oratory for an w regulatory s standards at 2	d it with clear ride readings Range Organi beed down 6 in osite of the ro and GRO arcial laborato, ase road and p 1 x, 2013, Ni the southeast alandards at 3.2.5 ft bgs. Discourse of the road and p 2 the southeast alandards at 3.2.5 ft bgs.	in imporable version above reconstruction of the construction of t	ted gravel. egulatory )) readings total of 48 taken and field values of non- eturned a trea were reviewed the of the battery augur point . GRO oles for the
regulations al public health should their o	l operators a or the envir operations ha nment. In a	are required to onnient. The ave failed to a ddition, NMO	report an acceptance dequately CD accept	is true and comp d/or file certain ne e of a C-141 repo investigate and re tance of a C-141	elease no rt by the emediate	otifications ar NMOCD ma contamination	nd perform correct arked as "Final R on that pose a threat the operator of	tive ac eport" eat to g respons	tions for rele does not reli ground water sibility for co	eases which eve the oper , surface wa	may er ator of ter, hu	danger Liability man health
Signature: Bruce Baker  Printed Name: Bruce Baker  Approved by Environmental Spe						X		DIVISM	SKI Sciolia	O		
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2						الما حمل م	- 1		_	CTUIL	
Title: Environ	Title: Environmental Tech					Approval Date: 2   V2   U   Expiration Date:						
	E-mail Address: larry.baker@apachecorp.com  Date: 1 - 29 - 14 Phone: (432) 631-6982						Approval:			Attached VRP-1	□ V~ V3	3-2993
* Attach Addit				(TJL) UJ1-UJ0Z						<u>'</u>	, , .	

JUN \$ 8 2014 NESAD 1416848234 K



HOBBS OCD

FEB 1 2 2014

RECEIVED

# **APACHE CORPORATION**

P.O.Box 1849 Eunice, NM 88231 Phone 575.394.3159

# H Corrigan Battery

(1RP-11-13-2993)

# **Termination Request**

NMOCD -DIST 1 2/12/14

Release Date: May 5<sup>th</sup>, 2013

Unit Letter G, Section 4, Township 22S, Range 37E

## Rice Environmental Consulting & Safety

P.O. Box 2948, Hobbs, NM 88241 Phone 575.393.2967

January 29th, 2014

#### **Geoffrey Leking**

New Mexico Energy, Minerals, & Natural Resources Oil Conservation Division, Environmental Bureau – District 1 1625 N. French Dr. Hobbs, NM 88240-9273

> RE: Termination Request Apache Corporation – H Corrigan Battery (1RP-11-13-2993) UL/G sec. 4 T22S R37E

Mr. Leking:

Apache Corporation (Apache) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site.

## **Background and Previous Work**

The site is located approximately 1 mile southwest of Eunice, New Mexico at UL/G sec. 4 T22S R37E. Groundwater at this site will likely be encountered at a depth of approximately 81 +/- feet.

On May 5<sup>th</sup>, 2013, Apache discovered a release of produced water at the H Corrigan Battery. The produced water tank was hit by lightning, which caused the release of 120 barrels over 9,504 square feet of battery lease pad and pasture land. Vacuum trucks were called to the site and recovered 110 barrels of produced water. NMOCD was notified of the release on May 10<sup>th</sup>, 2013 and an initial C-141 was submitted to NMOCD on May 28<sup>th</sup>, 2013 for their approval (Appendix A).

RECS personnel arrived at the site beginning on May 10<sup>th</sup>, 2013. Apache had already removed the contaminated gravel in the battery and replaced it with clean, imported gravel. RECS personnel sampled the release in 5 places and took the samples to a commercial laboratory for analysis (Figure 1). All 5 samples returned chloride readings above regulatory standards. Gasoline Range Organics (GRO) readings returned non-detect except for Pt. 4, which returned a value of 1,070 mg/kg. Diesel Range Organics (DRO) readings were below regulatory standards except for Pt. 4, which had a DRO reading of 5,710 mg/kg (Appendix B).

The release area outside the battery was scraped down 6 inches. A total of 48 yards of contaminated soil was taken to a NMOCD approved facility for disposal. Once the scrape was completed, a 6 point bottom composite of the road was taken and field tested for chlorides and organic vapors. The sample was then taken to a commercial laboratory and retuned a chloride value of 63.7 mg/kg and GRO and DRO values of non-detect. A total of 48 yards of caliche was imported to the site to serve as backfill. A sample of the

imported caliche was taken to a commercial laboratory and returned a chloride value of 73.5 mg/kg. Clean, imported top soil was imported to the site by Apache to serve as backfill for the pasture area. The lease road and pasture area were backfilled and contoured to the surrounding location.

Inside the battery, surface samples were taken and field tested for chlorides. On July 1<sup>st</sup>, 2013, NMOCD reviewed the surface sample field data and requested that the two highest points within the battery be augured to determine the depth of contaminants. The southeast corner of the battery and the center point between the tanks were hand augured for depth. Representative samples were taken to a commercial laboratory for analysis. The southeast augur point returned chloride values below regulatory standards starting at 2 ft bgs. The center augur point returned chloride values below regulatory standards at 3.5 ft bgs. GRO samples for both augur points were non-detect. DRO samples for the southeast augur point returned values below regulatory standards at 2.5 ft bgs. DRO samples for the center augur point returned values below regulatory standards at 3.5 ft bgs.

Photo documentation of all activities can be found in Appendix C.

The lease road and pasture were scraped to remove all contaminated soil and then backfilled with clean, imported soil. The battery shows a precipitous decline in chloride and TPH values. Given the depth to groundwater, the remaining constituents will not impact groundwater at this site and will be remediated during facility abandonment. Therefore, Apache requests 'remediation termination' and closure for the site. The final C-141 can be found in Appendix D.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-2967 or me if you have any questions or wish to discuss the site.

Sincerely,

Lara Weinheimer

Project Scientist

**RECS** 

(575) 441-0431

#### Attachments:

Figure 1 – Initial Sampling Data

Figure 2 – Excavation Sampling Data

Appendix A – Initial C-141

Appendix B – Laboratory Analyses

Appendix C – Photo Documentation

Appendix D - Final C-141

Figures

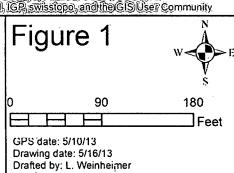
RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

# Initial Sampling Data

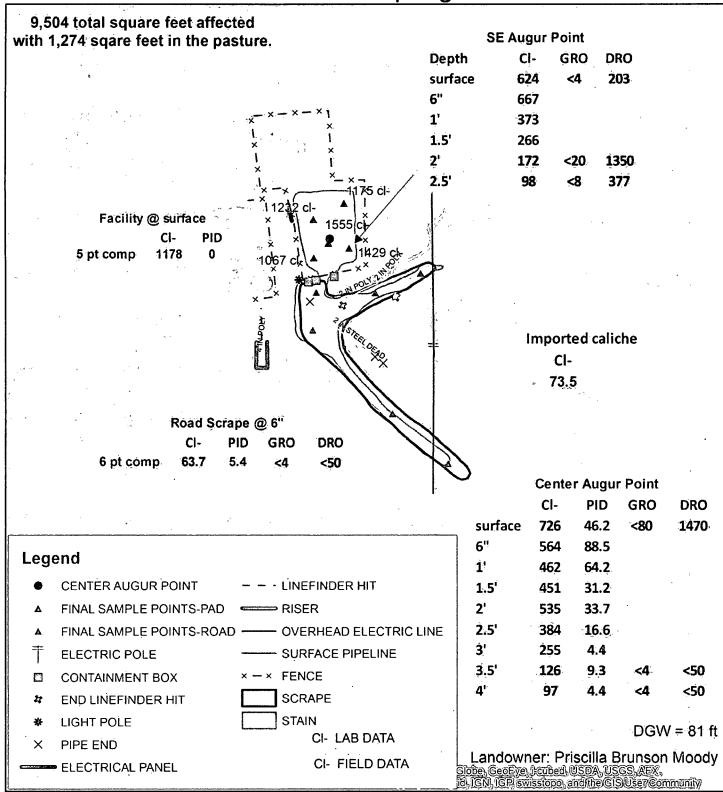
9,504 total square feet affected with 1,274 sqare feet in the pasture. **PT.5 DRO** LAB CI- GRO SURFACE SAMPLE 1220 <10 100 **PT.4** LAB CI- GRO **DRO SURFACE SAMPLE 1730** 5710 PT.2 LAB CI- GRO **DRO** PT.3 LAB CI- GRO **DRO** SURFACE SAMPLE 816 <10 279 SURFACE SAMPLE 608 <10 348 Pt. 1 PT.1 LAB CI- GRO **DRO** SURFACE SAMPLE 656 337 Legend **ELECTRIC POLE** - - - LINEFINDER HIT CONTAINMENT BOX - RISER OVERHEAD ELECTRIC LINE 22 END LINEFINDER HIT — # LIGHT POLE SURFACE PIPELINE PIPE END × - × - FENCE DGW = 81 ft SAMPLE POINTS STAIN Landowner: Priscilla Brunson Moody > ELECTRICAL PANEL lobe, GeoEye, houbed, USDA, USGS, ÅEX, J. IGN, IGP, swisstope, and the GISUser Community. Figure 1 APACHE H CORRIGAN **BATTERY AD** (1RP-11-13-2993)



LEGALS: UL/G sec. 4 T-22-S R-37-E LEA COUNTY, NM



## **Excavation Sampling Data**





## APACHE H CORRIGAN BATTERY AD (1RP-11-13-2993)

LEGALS: UL/G sec. 4 T-22-S R-37-E LEA COUNTY, NM

# Figure 2 0 90 180 GPS date: 7/31/13 Drawing date: 8/21/13 Drafted by: L. Weinheimer



RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

\* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 8840
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 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

	•		RREIG	ease Notific	eatior	and Co	rrective A	ction					
			-			OPERAT	ror	í	Initia	al Report	Final Report		
Name of C	ompany A	pache Corpo	oration			Contact Trammell, De Valle							
Address P	O Box 184	9, Eunice, N	M 88231				No. <b>(</b> 575) 393-7						
Facility Na	me H Cor	rigan Battery	<u>'</u>			Facility Typ	e Tank Battery	у					
Surface Ov	vner Prisc	illa Brunson	Moody	Mineral C	Owner				Lease N	Vo.			
				LOCA	ATIOI	N OF REI	LEASE						
Unit Letter	Section	Township	Range	Feet from the	North/	South Line	Feet from the	East/W	est Line	County			
G	4	22S	37E	1,351 ft	F	FNL	1,524 ft	F	EL	Lea			
		•	Latitude	32°25'27.779	<u>N"N</u>	Longitude_	103°9'51.661	1"W					
				NAT	URE	OF RELI	EASE						
Type of Rele	ease Produ	iced Water				<del></del>	Release 120 barr	rels	Volume I	Recovered 1	10 barrels		
Source of R	elease Proc	luced Water T	ank			Date and F 5/10/13	lour of Occurrenc	e	Date and	Hour of Disc	covery 5/10/13		
Was Immed	iate Notice (	Given?				If YES, To	Whom?						
1		$\boxtimes$	Yes _	No 🔲 Not R	equired	Geoff Leki	ng, NMOCD						
By Whom?							lour 5/10/13						
Was a Water	rcourse Read	_	Yes 🛭	l Na		If YES, Vo	lume Impacting t	he Water	course.				
f													
If a Waterco	ourse was Im	pacted, Descr	ibe Fully.*	k			•						
The produce Vacuum true to a commer Describe Are	ed water tan cks were cal cial laborate ea Affected	led to the site ory for analysi and Cleanup A	rigan Tan and recove s. Action Tak	k Battery was hit ered a total of 110	) barrels.	The site wa					of produced water. samples were taken		
regulations a public health should their or the enviro	all operators n or the envi operations h onment. In a	are required t ronment. The nave failed to	o report ar acceptant adequately OCD accep	is true and comp ad/or file certain rece of a C-141 repo investigate and retained transce of a C-141	elease no ort by the emediate	otifications a notifications me notifications notifications notification	nd perform correct arked as "Final R on that pose a thre	etive action eport" do eat to gro	ons for rel bes not rel ound water	eases which in the control of the co	may endanger rator of liability ter, human health		
Signature: Da Va Qa Zhammo Q)  Printed Name: Trammell, De Valle  Approved by District Super Davis Davi								DIVISIO JeRM Specialist	NO N				
Title: Prod	luction Fore	man				Approval Dat	e:	E	xpiration	Date:			
E-mail Addr	ess: deval	le.trammell@	apachecor	p.com	Conditions of Approval:								
Date:	Date: Phone: (575) 393-7106												

Appendix B Laboratory Analyses



May 16, 2013

STEVEN FLEMING

APACHE - EUNICE

P. O. BOX 1849

**EUNICE, NM 88231** 

RE: CORRIGAN BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 05/14/13 8:25.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at <a href="https://www.tceq.texas.gov/field/qa/lab">www.tceq.texas.gov/field/qa/lab</a> accred certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2

Haloacetic Acids (HAA-5)

Method EPA 524.2

Total Trihalomethanes (TTHM)

Method EPA 524.4

Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

Celey D. Keene

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager



#### Analytical Results For:

APACHE - EUNICE STEVEN FLEMING P. O. BOX 1849 **EUNICE NM. 88231** Fax To: 394-2425

Received:

05/14/2013

Sampling Date: Sampling Type: 05/10/2013

Reported:

05/16/2013

Soil

Project Name:

CORRIGAN BATTERY

Sampling Condition:

Cool & Intact

Project Number:

NONE GIVEN

116%

63.6-154

Project Location:

NOT GIVEN

Sample Received By:

Jodi Henson

## Sample ID: PT. 1 SURFACE SAMPLE (H301142-01)

Chloride, SM4500CI-B	mg	/kg	Analyze	d By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	656	16.0	05/14/2013	ND	432	108	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS			•		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC .	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/14/2013	ND	211	106	200	1.96	
DRO >C10-C28	337	10.0	05/14/2013	ND	208	104	200	1.47	
Surrogate: 1-Chlorooctane	108	% 65.2-14	0		-				
Surrogate: 1-Chlorooctadecane	113	% 63.6-15	4						

## Sample ID: PT. 2 SURFACE SAMPLE (H301142-02)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: DW				<del></del>	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	816	16.0	05/14/2013	ND	432	108	400	0.00	
TPH 8015M	mg	/kg	Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/14/2013	ND	211	106	200	1.96	
DRO >C10-C28	279	10.0	05/14/2013	ND	208	· 104	200 -	1.47	
Surrogate: 1-Chlorooctane		% 65.2-14	10						

#### Cardinal Laboratories

Surrogate: I-Chlorooctadecane

\*=Accredited Analyte

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Celeg & Keine



#### Analytical Results For:

APACHE - EUNICE STEVEN FLEMING P. O. BOX 1849 **EUNICE NM, 88231** 394-2425 Fax To:

Received:

05/14/2013

Sampling Date: Sampling Type: 05/10/2013

Reported:

05/16/2013

Soil

Project Name:

**CORRIGAN BATTERY** 

Sampling Condition:

Cool & Intact

Project Number:

NONE GIVEN

Sample Received By:

Jodi Henson

Project Location:

NOT GIVEN

#### Sample ID: PT. 3 SURFACE SAMPLE (H301142-03)

Chloride, SM4500CI-B	mg	/kg	Analyze	d By: DW			·		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	608	16.0	05/14/2013	ND	432	108	400	0.00	
TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/14/2013	ND	211	106	200	1.96	,
DRO >C10-C28	348	10.0	05/14/2013	ND	208	104	200	1.47	
Surrogate: 1-Chloroctane	112	% 65.2-14	10					•	

Surrogate: 1-Chlorooctane

65.2-140

Surrogate: 1-Chlorooctadecane

116%

63.6-154

#### Sample ID: PT. 4 SURFACE SAMPLE (H301142-04)

Chloride, SM4500CI-B	mg	/kg	Analyze	d By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1730	16.0	05/14/2013	ND	432	108	400	0.00		
TPH 8015M	mg/kg		Analyzed By: MS			<u> </u>			S-06	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	1070	50.0	05/14/2013	ND	211	106	200	1.96		
DRO >C10-C28	5710	50.0	05/14/2013	ND	208	104	200	1.47		

Surrogate: 1-Chlorooctadecane

195 %

63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene



#### Analytical Results For:

APACHE - EUNICE STEVEN FLEMING P. O. BOX 1849 EUNICE NM, 88231 Fax To: 394-2425

Received: Reported: 05/14/2013

05/16/2013

Project Name:

CORRIGAN BATTERY

Project Number: Project Location:

NONE GIVEN

Sampling Date:

05/10/2013

Sampling Type:

Soil

Sampling Condition:

Cool & Intact

Sample Received By:

Jodi Henson

## Sample ID: PT. 5 SURFACE SAMPLE (H301142-05)

Chloride, SM4500CI-B	mg	/kg	Analyze	d By: DW		•			
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1220	16.0	05/14/2013	ND	432	108	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/14/2013	ND	211	106	200	1.96	
DRO >C10-C28	100	10.0	05/14/2013	ND	208	104	200	1.47	
Surrogate: 1-Chloroactane	108	% 65.2-14	0						
Surrogate: 1-Chlorooctadecane	112	% 63.6-15	4				•		

Cardinal Laboratories \*=Accredited Analyte

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Celeg D. Keene



#### **Notes and Definitions**

S-06 The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or

matrix interference's.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

\*\* Samples not received at proper temperature of 6°C or below.

\*\*\* Insufficient time to reach temperature.

Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories \*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celeg D. Keine



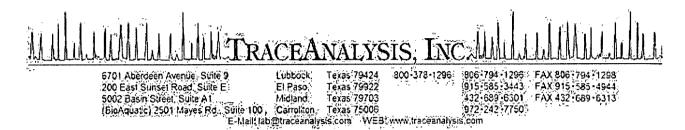
#### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (575) 393-2326 FAX (575) 393-2476

	(575) 393-2326 FAX	(575) 393-247	3								٠.		•									
Company Name	APACHE C	ORP.						BI	LL TO						ANA	LYSIS	RE	QUE	ST.			
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<sup>†</sup> Cardinal cannot accept verbal changes. Please fax written changes to (575) 393 326



## Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

## Analytical and Quality Control Report

Steven Fleming Apache Corp. - Midland 303 Veterans Airpark Lane Suite #3000 Midland, TX, 79705

Report Date: June 14, 2013

Work Order: 13060508

Project Name: Apache H Corrigan Battery AD, NM Project Number: Apache H Corrigan Battery AD, NM

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

			Date	1 mie	Date
Sample	Description	Matrix	Taken	Taken	Received
331032	6 pt. Comp. outside Facility	soil	2013-06-03	11:00	2013-06-05
331033	Imported Caliche	soil	2013-06-03	12:25	2013-06-05

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 13 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	3
Analytical Report	4
Sample 331032 (6 pt. Comp. outside Facility)	4
Sample 331033 (Imported Caliche)	5
Method Blanks	6
QC Batch 102056 - Method Blank (1)	6
QC Batch 102190 - Method Blank (1)	6
QC Batch 102265 - Method Blank (1)	6
Laboratory Control Spikes	7
QC Batch 102190 - LCS (1)	7
QC Batch 102265 - LCS (1)	7
QC Batch 102056 - MS (1)	8
QC Batch 102190 - MS (1)	8
QC Batch 102265 - MS (1)	8
Calibration Standards	10
QC Batch 102056 - ICV (1)	10
QC Batch 102056 - CCV (1)	10
QC Batch 102190 - CCV (1)	10
QC Batch 102190 - CCV (2)	10
QC Batch 102190 - CCV (3)	10
QC Batch 102265 - CCV (1)	11
QC Batch 102265 - CCV (2)	11
QC Batch 102265 - CCV (3)	11
Appendix	12
Report Definitions	12
Laboratory Certifications	12
Standard Flags	12
Attachmenta	10

## Case Narrative

Samples for project Apache H Corrigan Battery AD, NM were received by TraceAnalysis, Inc. on 2013-06-05 and assigned to work order 13060508. Samples for work order 13060508 were received intact at a temperature of 2.1 C.

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

		Prep	$\operatorname{Prep}$	QC	. Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	86466	2013-06-06 at 08:00	102056	2013-06-06 at 12:00
TPH DRO - NEW	S 8015 D	86642	2013-06-12 at 14:30	102265	2013-06-12 at 21:30
TPH GRO	S 8015 D	86577	2013-06-11 at 15:03	102190	22013-06-11 at 15:03

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 13060508 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.

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 4 of 13.

## Analytical Report

Sample: 331032 - 6 pt. Comp. outside Facility

Laboratory:

Lubbock

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

102056

Analytical Method: Date Analyzed:

SM 4500-Cl B 2013-06-06

Prep Method: N/A Analyzed By:

GS

86466

Sample Preparation:

2013-06-06

Prepared By:

GS

RL

Units Parameter Cert Result Dilution RLFlag Chloride 63.7 mg/Kg 5.00

Sample: 331032 - 6 pt. Comp. outside Facility

Laboratory:

Lubbock

Analysis:

TPH DRO - NEW

Analytical Method:

S 8015 D

Prep Method: N/A

QC Batch:

102265

Date Analyzed:

2013-06-12

Units

Analyzed By: CM

Prep Batch: 86642

Sample Preparation: 2013-06-12

Prepared By:

Dilution

DS

RL

Parameter Cert Flag

RLResult

 $\overline{\mathrm{DRO}}$ < 50.0 mg/Kg 50.0 U Spike Percent Recovery

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

Sample: 331032 - 6 pt. Comp. outside Facility

Laboratory:

Lubbock

Analysis:

TPH GRO

Analytical Method:

S 8015 D

Prep Method: S 5035

QC Batch: 102190 Prep Batch:

86577

Date Analyzed: Sample Preparation:

22013-06-11 2013-06-11

Analyzed By: JS Prepared By: JS

RLParameter Result Units Dilution RLFlag Cert GRO < 4.00 4.00 mg/Kg

Spike Percent Recovery Dilution Cert Amount Surrogate Flag Result Units Recovery Limits 69.6 - 124 Trifluorotoluene (TFT) 2.27 2.00 114 mg/Kg

continued ...

Report Date: June 14, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 5 of 13

 $sample\ continued\ \dots$ 

						Бріке	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
4-Bromofluorobenzene (4-BFB)			2.35	mg/Kg	1	2.00	118	77.7 - 120

## Sample: 331033 - Imported Caliche

Laboratory: Lubbock Analysis:

QC Batch:

Prep Batch: 86466

Chloride (Titration)

102056

Analytical Method: Date Analyzed:

2013-06-06 2013-06-06

SM 4500-Cl B

Prep Method: N/A Analyzed By:

GSPrepared By: GS

ВŢ

			1717			
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	RL
Chloride			73.5	mg/Kg	1	5.00

Sample Preparation:

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 6 of 13

## Method Blanks

Method Blank (1)

QC Batch: 102056

QC Batch:

102056

Date Analyzed:

2013-06-06

Analyzed By: GS

Prep Batch: 86466

Parameter

Chloride

Cert

Prepared By:

QC Preparation:

2013-06-06

MDL

Result < 3.05

RLUnits mg/Kg

5

Method Blank (1)

QC Batch: 102190

Flag

QC Batch:

102190

Date Analyzed:

22013-06-11

Analyzed By: JS

Prep Batch: 86577

QC Preparation:

2013-06-11

Prepared By: JS

		MDL -								
Parameter	$\mathbf{F}$ lag	$\operatorname{Cert}$	Result	Units	RL					
GRO		1	< 0.230	mg/Kg	4					

•						Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	1	2.00	100	69.6 - 124
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	77.7 - 120

Method Blank (1)

QC Batch: 102265

QC Batch: 102265

Prep Batch: 86642

Date Analyzed:

QC Preparation:

2013-06-12

2013-06-12

Analyzed By: CM

Prepared By: CM

MDL

Units RLParameter Flag Cert Result DRO < 5.22 mg/Kg 50

						Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Cert	Result	Units	Dilution	${ m Amount}$	Recovery	Limits
n-Tricosane			101	mg/Kg	1	100	101	70 - 130

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 7 of 13

## **Laboratory Control Spikes**

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

QC Batch:

102190

Date Analyzed:

22013-06-11

Analyzed By: JS

Prep Batch: 86577

QC Preparation: 2013-06-11

Prepared By: JS

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1	15.6	${ m mg/Kg}$	1	20.0	< 0.230	78	66.9 - 120

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.	$\mathbf{Limit}$	RPD	Limit
GRO		1	16.2	mg/Kg	1	20.0	< 0.230	81	66.9 - 120	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.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.85	1.86	mg/Kg	1	2.00	92	93	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.01	2.07	mg/Kg	1	2.00	100	104	77.7 - 120

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

QC Batch:

102265

Prep Batch: 86642

Date Analyzed:

2013-06-12

QC Preparation: 2013-06-12

Analyzed By: CM .

Prepared By: CM

			LCS			$\operatorname{Spike}$	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	${ m Amount}$	Result	Rec.	$\operatorname{Limit}$
DRO		1	312	mg/Kg	1	250	< 5.22	125	70 - 130

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.	Limit	RPD	Limit
DRO		1	324	mg/Kg	1	250	< 5.22	130	70 - 130	4	20

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

	LCS	LCSD			$_{ m Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	$\operatorname{Limit}$
n-Tricosane	95.2	99.9	mg/Kg	1	100	95	100	70 - 130

Report Date: June 14, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 8 of 13

Matrix Spike (MS-1)

Spiked Sample: 331033

QC Batch:

102056

Date Analyzed:

2013-06-06

Analyzed By: GS

Prep Batch: 86466

QC Preparation: 2013-06-06

Prepared By: GS

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
Chloride			534	${ m mg/Kg}$	1	500	73.5	92	63.6 - 131

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.	$\operatorname{Limit}$	RPD	Limit
Chloride			529	mg/Kg	1	500	73.5	91	63.6 - 131	1	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: 331472

QC Batch:

102190

Date Analyzed:

22013-06-11

Analyzed By: JS

Prep Batch: 86577

QC Preparation: 2013-06-11

Prepared By: JS

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	$\operatorname{Units}$	Dil.	${ m Amount}$	Result	Rec.	$\operatorname{Limit}$
GRO		1	18.4	mg/Kg	1	20.0	0.278	91	38.8 - 120

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	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$
GRO		1	18.0	mg/Kg	1	20.0	0.278	89	38.8 - 120	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.13	2.00	mg/Kg	1	2	106	100	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.37	2.29	${ m mg/Kg}$	1	2	118	114	77.7 - 120

Matrix Spike (MS-1)

Prep Batch: 86642

Spiked Sample: 331032

QC Batch:

102265

Date Analyzed:

2013-06-12

QC Preparation: 2013-06-12

Analyzed By: CM

Prepared By: CM

Report Date: June 14, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 9 of 13

Param	F	С 1	MS Result	Units	Dil.	Spike Amount		atrix sult I	Rec.	Rec.
DRO		1	292	mg/Kg	1	250	88	8.1	82	70 - 130
Percent recovery is based on the spik	e resu	lt. RPD MSD	is based o	n the sp	oike and sp Spike	oike duplica Matrix	ate resu	ılt. Rec.		RPD
Param F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	1	294	mg/Kg	1	250	88.1	.82	70 - 130	1	20
Percent recovery is based on the spik	e resu	lt. RPD	is based o	n the sr	oike and sr	ike duplica	ate resu	ılt		

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	${ m Amount}$	Rec.	Rec.	$_{ m Limit}$
n-Tricosane	98.4	98.2	mg/Kg	1	100	98	98	70 - 130

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 10 of 13

## Calibration Standards

## Standard (ICV-1)

QC Batch: 102056

Date Analyzed: 2013-06-06

Analyzed By: GS

				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2013-06-06

## Standard (CCV-1)

QC Batch: 102056

Date Analyzed: 2013-06-06

Analyzed By: GS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-06-06

## Standard (CCV-1)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

	•			CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.996	· 100	80 - 120	22013-06-11

#### Standard (CCV-2)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent .	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.975	98	80 - 120	22013-06-11

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 11 of 13

Standard (CCV-3)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.941	94	80 - 120	22013-06-11

Standard (CCV-1)

QC Batch: 102265

Date Analyzed: 2013-06-12

Analyzed By: CM

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	244	98	80 - 120	2013-06-12

Standard (CCV-2)

QC Batch: 102265

Date Analyzed: 2013-06-12

Analyzed By: CM

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	239	96	80 - 120	2013-06-12

Standard (CCV-3)

QC Batch: 102265

Date Analyzed: 2013-06-12

Analyzed By: CM

Work Order: 13060508 Apache H Corrigan Battery AD, NM

Page Number: 12 of 13

## Appendix

## Report Definitions

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
1	NELAP	T104704219-13-9	Lubbock

## Standard Flags

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

## Attachments

Work Order: 13060508 Apache H Corrigan Battery AD, NM Page Number: 13 of 13

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

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## Certifications

 $\operatorname{DoD}$  LELAP NCTRCA DBENELAP Kansas Oklahoma ISO 17025

## Analytical and Quality Control Report

Steven Fleming Apache Corp.-Midland 303 Veterans Airpark Lane Suite #3000 Midland, TX, 79705

Report Date: June 24, 2013

Work Order:

13060727

Project Name:

Apache H Corrigan Battery AD, NM Project Number: Apache H Corrigan Battery AD, NM

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

			Date	$\operatorname{Time}$	$\operatorname{Date}$
Sample	Description	Matrix	Taken	Taken	Received
331476	Southeast Corner Surface	soil	2013-06-03	12:00	2013-06-07
331477	Southeast Corner @ 2'	soil	2013-06-03	12:05	2013-06-07
331478	Southeast Corner @ 2.5'	soil	2013-06-03	12:10	2013-06-07

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 22 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 Sample 331476 (Southeast Corner Surface) Sample 331477 (Southeast Corner @2'). Sample 331478 (Southeast Corner @2.5').	5 5 6 7
· · · · · · · · · · · · · · · · · · ·	9 9 9 10
QC Batch 102189 - LCS (1) QC Batch 102190 - LCS (1) QC Batch 102265 - LCS (1) QC Batch 102417 - LCS (1) QC Batch 102552 - LCS (1) QC Batch 102189 - xMS (1) QC Batch 102190 - MS (1) QC Batch 102265 - MS (1) QC Batch 102417 - MS (1)	11 11 12 13 13 14 14
QC Batch 102189 - CCV (1) QC Batch 102189 - CCV (2) QC Batch 102189 - CCV (3) QC Batch 102190 - CCV (1) QC Batch 102190 - CCV (2) QC Batch 102190 - CCV (3) QC Batch 102190 - CCV (3) QC Batch 102265 - CCV (1) QC Batch 102265 - CCV (2) QC Batch 102265 - CCV (2) QC Batch 102417 - CCV (1) QC Batch 102417 - CCV (1) QC Batch 102552 - ICV (1)	17 17 17 18 18 18 19 19
Report Definitions	21 21 21 21

Attachments	 	 	 	22
Attachments	 	 	 	22

## Case Narrative

Samples for project Apache H Corrigan Battery AD, NM were received by TraceAnalysis, Inc. on 2013-06-07 and assigned to work order 13060727. Samples for work order 13060727 were received intact at a temperature of 6.6 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	86577	2013-06-11 at 15:03	102189	22013-06-11 at 15:03
Chloride (Titration)	SM 4500-Cl B	86871	2013-06-21 at 10:00	102552	2013-06-24 at 09:00
TPH DRO - NEW	S 8015 D	86642	2013-06-12 at 14:30	102265	2013-06-12 at 21:30
TPH DRO - NEW	S 8015 D	86754	2013-06-17 at 16:00	102417	2013-06-18 at 22:30
TPH GRO	S 8015 D	86577	2013-06-11 at 15:03	102190	22013-06-11 at $15:03$

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 13060727 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.

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 5 of 22

## Analytical Report

Sample: 331476 - Southeast Corner Surface

Laboratory:

Prep Batch:

Lubbock

Analysis:

Chloride (Titration)

QC Batch:

102552

86871

Analytical Method: Date Analyzed:

SM 4500-Cl B 2013-06-24

Prep Method: N/A

Analyzed By: GSGS

Sample Preparation:

2013-06-21

Prepared By:

			. RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			624	m mg/Kg	1	5.00

Sample: 331476 - Southeast Corner Surface

Laboratory:

Lubbock

Analysis:

DRO

TPH DRO - NEW

Analytical Method:

S 8015 D

Prep Method: N/A Analyzed By:

CM

QC Batch: 102265 Prep Batch: 86642

Date Analyzed: Sample Preparation: 2013-06-12 2013-06-12

mg/Kg

Prepared By: DS

Parameter Flag Cert

RLResult Units

Dilution RL50.0

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			123	mg/Kg	1	100	123	70 - 130

203

Sample: 331476 - Southeast Corner Surface

Laboratory:

Prep Batch:

Lubbock

86577

Analysis: QC Batch: 102190

TPH GRO

Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D

22013-06-11 2013-06-11

Prep Method: S 5035 Analyzed By: JS

JS

Prepared By:

RLParameter Flag Cert Result Units Dilution RLGRO < 4.00 mg/Kg 4.00

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.80	m mg/Kg	1	2.00	90	69.6 - 124

continued ...

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 6 of 22

$sample\ continued\ \dots$								
•						$_{ m Spike}$	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
4-Bromofluorobenzene (4-BFB)			2.25	mø/Kø	1	2.00	112	77.7 - 120

## Sample: 331477 - Southeast Corner @ 2'

Laboratory: Lubbock

Analysis:

BTEX 102189

Analytical Method: Date Analyzed:

S 8021B 22013-06-11 Prep Method: S 5035 Analyzed By:

JS

QC Batch: Prep Batch: 86577

Sample Preparation: 2013-06-11

Prepared By: JS

				RL	•		
Parameter		$\operatorname{Flag}$	Cert	Result	Units	Dilution	RL
Benzene	I	U	1	< 0.100	mg/Kg	5	0.0200
Toluene		U	1	< 0.100	${ m mg/Kg}$	5	0.0200
Ethylbenzene		U	1	< 0.100	m mg/Kg	5	0.0200
Xylene		U	1	< 0.100	mg/Kg	5	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	$egin{array}{c}  ext{Recovery} \  ext{Limits} \end{array}$
Trifluorotoluene (TFT)			1.70	mg/Kg	5	2.00	85	69.6 - 120
4-Bromofluorobenzene (4-BFB)			2.18	mg/Kg	5	2.00	109	69.2 - 120

## Sample: 331477 - Southeast Corner @ 2'

Laboratory:

Lubbock

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch: 86871

102552

Date Analyzed: Sample Preparation:

2013-06-24 2013-06-21

Analyzed By: GSPrepared By: GS

		RL							
Parameter	$\operatorname{Flag}$	Cert	Result	$\operatorname{Units}$	Dilution	RL			
Chloride			172	ıng/Kg	5	5.00			

#### Sample: 331477 - Southeast Corner @ 2'

Laboratory: Lubbock

Analysis:

TPH DRO - NEW 102417

Analytical Method: Date Analyzed:

S 8015 D 2013-06-18 Prep Method: N/A Analyzed By: DSPrepared By: DS

QC Batch: Prep Batch: 86754

Sample Preparation: 2013-06-17

Work Order: 13060727 Apache H Corrigan Battery AD, NM

					RL ·				
Parameter		$\operatorname{Flag}$	$\operatorname{Cert}$	Re	sult	$\operatorname{Units}$	Dilution	RL	
DRO	-			1	350	mg/Kg	1	50.0	
	-					Spike	Percent	Recovery	
Surrogate	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits	
n-Tricosane			231	mg/Kg	1	100	231	35.2 - 240	

#### Sample: 331477 - Southeast Corner @ 2'

Laboratory: Lubbock

Analysis: TPH GRO Analytical Method:

S 8015 D 22013-06-11 Prep Method: S 5035

Page Number: 7 of 22

QC Batch: Prep Batch: 86577

102190

Date Analyzed: Sample Preparation: 2013-06-11 Analyzed By: JSPrepared By: JS

RLFlag Cert Result Units Dilution RLParameter < 20.0 mg/Kg 4.00 GRO

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	$\mathbf{Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			1.61	mg/Kg	5	2.00	80	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.00	$\mathrm{mg}/\mathrm{Kg}$	5	2.00	100	77.7 - 120

#### Sample: 331478 - Southeast Corner @ 2.5'

Laboratory: Lubbock

Analysis: BTEX QC Batch: 102189 Prep Batch: 86577

Analytical Method: S 8021B Date Analyzed: 22013-06-11 Sample Preparation: 2013-06-11

Prep Method: S 5035 Analyzed By: JSPrepared By: JS

RLUnits Dilution Parameter Flag Cert Result RLBenzene < 0.0400 mg/Kg 2 0.0200 U < 0.0400 mg/Kg2 0.0200 Toluene U Ethylbenzene < 0.0400 mg/Kg2 0.0200U mg/Kg2 < 0.0400 0.0200Xylene

						$\operatorname{Spike}$	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.82	ıng/Kg	2	2.00	91	69.6 - 120
4-Bromofluorobenzene (4-BFB)			2.08	${ m mg/Kg}$	2	2.00	104	69.2 - 120

Report Date: June 24, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 8 of 22

Sample: 331478 - Southeast Corner @ 2.5'

Laboratory:

Lubbock

Analysis: Chloride (Titration)

QC Batch: 102552 Prep Batch: 86871

Analytical Method: Date Analyzed:

SM 4500-Cl B 2013-06-24

Prep Method: N/A Analyzed By: GS-GS

Sample Preparation:

2013-06-21

Prepared By:

RL

Result Dilution Parameter Flag Cert Units RLChloride 98.0 mg/Kg 5.00

Sample: 331478 - Southeast Corner @ 2.5'

Laboratory:

Lubbock

Analysis:

TPH DRO - NEW

QC Batch: 102417 Prep Batch: 86754

Analytical Method:

Date Analyzed:

Sample Preparation:

S 8015 D 2013-06-18 2013-06-17 Prep Method: Analyzed By:

N/A DS Prepared By: DS

RL

50.0

RLFlag Cert Result Units Dilution Parameter  $\overline{\mathrm{DRO}}$ 377 mg/Kg

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			158	mg/Kg	1	100	158	35.2 - 240

Sample: 331478 - Southeast Corner @ 2.5'

Laboratory:

Lubbock

Analysis: TPH GRO QC Batch: 102190 Prep Batch: 86577

Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D 22013-06-11 2013-06-11

Prep Method: S 5035

Analyzed By: JSPrepared By: JS

RLFlag Cert Result Units Dilution RLParameter < 8.00 4.00 GRO mg/Kg

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.81	mg/Kg	2	2.00	90	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.12	mg/Kg	2	2.00	106	77.7 - 120

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 9 of 22

# Method Blanks

Method Blank (1)

QC Batch: 102189

QC Batch:

102189

Prep Batch: 86577

Date Analyzed: QC Preparation: 2013-06-11

22013-06-11

Analyzed By: JS

Prepared By: JS

			$\mathrm{MDL}$		
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	RL
Benzene		1	< 0.00473	mg/Kg	0.02
Toluene		1	< 0.00416	$\mathrm{mg/Kg}$	0.02
Ethylbenzene		1	< 0.00511	$\mathrm{mg}/\mathrm{Kg}$	0.02
Xylene		1	0.00930	mg/Kg	0.02

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1	2.00	98	69.6 - 120
4-Bromofluorobenzene (4-BFB)			2.05	mg/Kg	1	2.00	102	69.2 - 120

Method Blank (1)

QC Batch: 102190

QC Batch: Prep Batch: 86577

102190

Date Analyzed: 22013-06-11 QC Preparation: 2013-06-11

Analyzed By: JS Prepared By: JS

MDL

Parameter Flag Cert Result Units RLGRO < 0.230 mg/Kg

						$\operatorname{Spike}$	Percent	Recovery
Surrogate	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	1	2.00	100	69.6 - 124
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	_ 1	2.00	99	77.7 - 120

Method Blank (1)

QC Batch: 102265

QC Batch: Prep Batch: 86642

102265

Date Analyzed:

2013 - 06 - 12

QC Preparation: 2013-06-12

Analyzed By: CM Prepared By: CM

Report Date: June 24, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 10 of 22

Parameter		Fla	ng	Cert	MDL Result		Units	RL	
DRO				1	< 5.22		${ m mg/Kg}$	50	
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
n-Tricosane			101	mg/Kg	1	100	101	70 - 130	

Method Blank (1)

QC Batch: 102417

QC Batch: 102417Prep Batch: 86754

Date Analyzed:

2013-06-18 QC Preparation: 2013-06-17

Analyzed By: DS Prepared By: DS

RL

MDL Units Cert Result Parameter Flag <15.3 mg/Kg DRO

						Spike	Percent -	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	$_{ m Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane			105	mg/Kg	1	100	105	35.2 - 240

Method Blank (1)

QC Batch: 102552.

QC Batch: Prep Batch: 86871

102552

Date Analyzed:

QC Preparation:

2013-06-24 2013-06-21 Analyzed By: GS

Prepared By: GS

			$\mathrm{MDL}$		
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	RL
Chloride			< 3.05	mg/Kg	5

Work Order: 13060727 Apache H Corrigan Battery AD, NM

# Laboratory Control Spikes

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

QC Batch:

Prep Batch: 86577

Date Analyzed:

22013-06-11

Analyzed By: JS

QC Preparation: 2013-06-11

Prepared By: JS

Page Number: 11 of 22

Param	F	С	LCS Result	Units	Dil.	$rac{ ext{Spike}}{ ext{Amount}}$	Matrix Result	Rec.	Rec. Limit
Benzene	<del></del>	1	1.90	mg/Kg	1	2.00	< 0.00473	95	74.6 - 120
Toluene		1	1.98	mg/Kg	1	2.00	< 0.00416	99	77.1 - 120
Ethylbenzene		1	2.10	mg/Kg	1	2.00	< 0.00511	105	75 - 120
Xylene		1	6.22	mg/Kg	1	6.00	0.0093	104	77 - 120

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.	$\operatorname{Limit}$	RPD	Limit
Benzene		1	1.75	mg/Kg	1	2.00	< 0.00473	88	74.6 - 120	8	20
Toluene		1	1.82	mg/Kg	1.	2.00	< 0.00416	91	77.1 - 120	8	20
Ethylbenzene		1	1.92	mg/Kg	1	2.00	< 0.00511	96	75 - 120	9	20
Xylene		1	5.69	mg/Kg	1	6.00	0.0093	95	77 - 120	9	20

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

Surrogate	$rac{ ext{LCS}}{ ext{Result}}$	LCSD Result	Units	Dil.	${ m Spike} \ { m Amount}$	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.09	1.91	mg/Kg	1	2.00	104	96	69.6 - 120
4-Bromofluorobenzene (4-BFB)	2.20	2.02	mg/Kg	1	2.00	110	101	69.2 - 120

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

QC Batch: Prep Batch: 86577

102190

Date Analyzed:

22013-06-11 QC Preparation: 2013-06-11

Analyzed By: JS Prepared By: JS

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1	15.6	$\mathrm{mg/Kg}$	1	20.0	< 0.230	78	66.9 - 120

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

 $continued \dots$ 

DRO

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 12 of 22

control spikes continued ... LCSD Spike Rec. **RPD** Matrix F С Result Units Dil. Amount Result Rec. Limit RPD Limit Param LCSD RPD Spike Matrix Rec.  $\mathbf{C}$ Param F Result Units Dil. Amount Result Rec. Limit RPD Limit GRO 20.0 < 0.230 66.9 - 120 16.2 mg/Kg 81 20 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. LCSD LCS LCSD Rec. LCS Spike Surrogate Result Result Units Dil. Amount Rec. Rec. Limit 2.00 69.6 - 124 Trifluorotoluene (TFT) 1.85 1.86 mg/Kg 92 93 2.00 100 104 77.7 - 1204-Bromofluorobenzene (4-BFB) 2.01 2.07 mg/Kg Laboratory Control Spike (LCS-1) Analyzed By: CM QC Batch: 102265 Date Analyzed: 2013-06-12 2013-06-12 Prepared By: Prep Batch: 86642 QC Preparation: CMLCS Spike Matrix Rec. Param  $\mathbf{C}$ Result Units Dil. Amount Result Rec. Limit DRO 312 mg/Kg 250 < 5.22 125 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  $\mathbf{C}$ Result Units Dil. Amount Result Rec. Limit RPD Limit  $\overline{\text{DRO}}$ 130 324 mg/Kg 250  $<5.\overline{22}$ 70 - 130 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 Limit Result Result Units Dil. Amount Rec. Rec. n-Tricosane 95.2 99.9 mg/Kg 100 95 100 70 - 130 Laboratory Control Spike (LCS-1) Analyzed By: DS QC Batch: 102417 Date Analyzed: 2013-06-18 Prep Batch: 86754 2013-06-17 Prepared By: DS QC Preparation: LCS Rec. Spike Matrix Dil. Limit Param Result Units Amount Result Rec.

250

mg/Kg

250

<15.3

100

64.8 - 138

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 13 of 22

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

				LCSD			Spike	Matrix		Rec.		RPD
Param		$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount .	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$
DRO			1	245	mg/Kg	1	250	<15.3	98	64.8 - 138	2	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	98.5	97.0	mg/Kg	1	100	98	97	35.2 - 240

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

QC Batch:

102552

Date Analyzed:

2013-06-24

Analyzed By: GS

Prep Batch: 86871

QC Preparation: 2013-06-21

Prepared By:

			LCS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
Chloride			100	mg/Kg	ĺ	100	< 3.05	100	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	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	Limit
Chloride			100	mg/Kg	1	100	< 3.05	100	85 - 115	0	20

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

Matrix Spike (xMS-1) Spiked Sample: 331472

QC Batch: 102189

Date Analyzed:

22013-06-11

Analyzed By: JS

Prep Batch: 86577

QC Preparation: 2013-06-11

Prepared By: JS

Rec. MS Spike Matrix Param F С Units Dil. Amount Result Rec. Limit Result 68.8 - 120 2.00 94 < 0.00473 Benzene 1.88 mg/Kg 71.8 - 122 2.0099 Toluene 1.98 mg/Kg 1 0.006375 - 130 Ethylbenzene 2.14 mg/Kg1 2.00 0.0058 107 6.00 0.0205 105 75.4 - 129Xylene 6.31 mg/Kg

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

 $continued \dots$ 

Work Order: 13060727 Apache H Corrigan Battery AD, NM

matrix spikes continued . . . RPD **MSD** Spike Matrix Rec. С Ďil. Amount Result Limit RPD Limit F Result Units Rec. Param MSD RPD Spike Matrix Rec. F Dil. Result Limit RPD Limit Param  $\mathbf{C}$ Result Units Amount Rec. 2.00 68.8 - 120 20 Benzene 1.97 mg/Kg < 0.00473 98 5 20 Toluene 2.05 mg/Kg 1 2.00 0.0063102 71.8 - 1224 20 Ethylbenzene 2.17 mg/Kg 1 2.00 0.0058 108 75 - 1301 mg/Kg 6.00 0.0205106 75.4 - 129 2 20 Xylene 6.41 1

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.99	2.11	mg/Kg	1	2	100	106	69.6 - 120
4-Bromofluorobenzene (4-BFB)	2.20	2.29	mg/Kg	1	2	110	114	69.2 - 120

Matrix Spike (MS-1) Spiked Sample: 331472

QC Batch: 102190 Prep Batch: 86577

Date Analyzed:

22013-06-11 QC Preparation: 2013-06-11

Analyzed By: JS Prepared By:

Page Number: 14 of 22

			MS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit ·
GRO		1	18.4	mg/Kg	1	20.0	0.278	91	38.8 - 120

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	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		1	18.0	mg/Kg	1	20.0	0.278	89	38.8 - 120	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	$\operatorname{Limit}$
Trifluorotoluene (TFT)	2.13	2.00	mg/Kg	1	2	106	100	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.37	2.29	${ m mg/Kg}$	1	2	118	114	77.7 - 120

Matrix Spike (MS-1) Spiked Sample: 331032

102265 QC Batch: Prep Batch: 86642

Date Analyzed: QC Preparation: 2013-06-12

2013-06-12

Analyzed By: CM Prepared By: CM

Report Date: June 24, 2013

Chloride

Apache H Corrigan Battery AD, NM

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 15 of 22

MSSpike Matrix Rec. F Param  $\mathbf{C}$ Result Units Dil. Amount Result Rec. Limit 70 - 130 DRO 292 mg/Kg 250 88.1 82 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. RPD **MSD** Spike Matrix Rec. Param F  $\mathbf{C}$ Units Dil. Rec. Limit **RPD** Result Amount Result Limit DRO 250 88.1 82 70 - 130 20 294 mg/Kg Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. MS MSD MS MSD Rec. Spike Dil. Rec. Limit Surrogate Result Result Units Amount Rec. 70 - 130 n-Tricosane 98.4 98.2 mg/Kg 100 98 98 1 Matrix Spike (MS-1) Spiked Sample: 331478 QC Batch: 102417 Date Analyzed: 2013-06-18 Analyzed By: DS 2013-06-17 Prep Batch: 86754 QC Preparation: Prepared By: DS MS Spike Matrix Rec. F Param  $\mathbf{C}$ Result Units Dil. Amount Result Rec. Limit DRO 789 mg/Kg 250 377 165 15.5 - 174 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. RPD **MSD** Spike Matrix Rec.  $\mathbf{F}$  $\mathbf{C}$ Dil. Result RPD Param Result Units Amount Rec. Limit Limit DRO 707 mg/Kg 250 377 132 15.5 - 17420 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. MS MSD MS **MSD** Rec. Spike Dil. Rec. Limit Surrogate Result Result Units Amount Rec. 35.2 - 240 n-Tricosane 166 189 mg/Kg 1 100 166 189 Matrix Spike (MS-1) Spiked Sample: 331478 QC Batch: 2013-06-24 Analyzed By: 102552 Date Analyzed: GS Prep Batch: 2013-06-21 Prepared By: GS 86871 QC Preparation: MS Spike Matrix Rec. Rec. Param F  $\mathbf{C}$ Result Units Dil. Amount Result Limit

491

mg/Kg

5

500

98

79

63.6 - 131

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 16 of 22

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
Chloride			467	mg/Kg	5	500	98	74	63.6 - 131	5	20 ·

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

Work Order: 13060727 Apache H Corrigan Battery AD, NM

# Calibration Standards

#### Standard (CCV-1)

QC Batch: 102189

Date Analyzed: 22013-06-11

Analyzed By: JS

Page Number: 17 of 22

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene	. 9	1	mg/kg	0.100	0.100	100	80 - 120	. 22013-06-11
Toluene		1	mg/kg	0.100	0.0958	96	80 - 120	22013-06-11
Ethylbenzene		1	mg/kg	0.100	0.0974	97	80 - 120	22013-06-11
Xylene		1	mg/kg	0.300	0.287	96	80 - 120	22013-06-11

### Standard (CCV-2)

QC Batch: 102189

Date Analyzed: 22013-06-11

Analyzed By: JS

•				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.104	104	80 - 120	22013-06-11
Toluene		1	mg/kg	0.100	0.101	101	80 - 120	22013-06-11
Ethylbenzene		1	mg/kg	0.100	0.101	101	80 - 120	22013-06-11
Xylene		1	mg/kg	0.300	0.295	98	80 - 120	22013-06-11

#### Standard (CCV-3)

QC Batch: 102189

Date Analyzed: 22013-06-11

Analyzed By: JS

				CCVs	CCVs	$\mathrm{CCVs}$	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.0976	98	80 - 120	22013-06-11
Toluene		1	mg/kg	0.100	0.0940	94	80 - 120	22013-06-11
Ethylbenzene		1	mg/kg	0.100	0.0947	95	80 - 120	22013-06-11
Xylene		1	mg/kg	0.300	0.277	92	80 - 120	22013-06-11

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 18 of 22

Standard (CCV-1)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

	•			CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.996	100	80 - 120	22013-06-11

Standard (CCV-2)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.975	98	80 - 120	22013-06-11

Standard (CCV-3)

QC Batch: 102190

Date Analyzed: 22013-06-11

Analyzed By: JS

				CCVs	CCVs	CCVs	Percent	
				$\operatorname{True}$	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.941	94	80 - 120	22013-06-11

Standard (CCV-1)

QC Batch: 102265

Date Analyzed: 2013-06-12

Analyzed By: CM

				CCVs	$\operatorname{CCVs}$	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
.DRO		1	mg/Kg	250	244	98	80 - 120	2013-06-12

Standard (CCV-2)

QC Batch: 102265

Date Analyzed: 2013-06-12

Analyzed By: CM

Work Order: 13060727 Apache H Corrigan Battery AD, NM

.3060727 Page Number: 19 of 22

			•					
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	239	96	80 - 120	2013-06-12

#### Standard (CCV-3)

QC Batch: 102265 .

Date Analyzed: 2013-06-12

Analyzed By: CM

			•	CCVs	CCVs	CCVs .	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	$\operatorname{Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	235	94	80 - 120	2013-06-12

#### Standard (CCV-1)

QC Batch: 102417

Date Analyzed: 2013-06-18

Analyzed By: DS

				CCVs	CCVs	CCVs	Percent	-
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	$_{\_}$ Limits	Analyzed
DRO		1	mg/Kg	250	223	89	80 - 120	2013-06-18

#### Standard (CCV-2)

QC Batch: 102417

Date Analyzed: 2013-06-18

Analyzed By: DS

				CCVs	CCVs	$_{ m CCVs}$	Percent	_
				True	Found	Percent	Recovery	$\operatorname{Date}$
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	219	88	80 - 120	2013-06-18

#### Standard (ICV-1)

QC Batch: 102552

Date Analyzed: 2013-06-24

Analyzed By: GS

Report Date: June 24, 2013

Apache H Corrigan Battery AD, NM

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 20 of 22

				ICVs True	ICVs Found	$rac{ ext{ICVs}}{ ext{Percent}}$	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-06-24

Standard (CCV-1)

QC Batch: 102552

Date Analyzed: 2013-06-24

Analyzed By: GS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$\operatorname{Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			${ m mg/Kg}$	100	100	100	85 - 115	2013-06-24

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 21 of 22

# **Appendix**

### Report Definitions

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

### **Laboratory Certifications**

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

### Standard Flags

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

#### Result Comments

Work Order: 13060727 Apache H Corrigan Battery AD, NM Page Number: 22 of 22

- 1 Sample dilution due to hydrocarbons.
- 2 Dilution due to turbidity.
- 3 Sample dilution due to hydrocarbons.
- 4 Dilution due to turbidity.

### Attachments

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

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### Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

# Analytical and Quality Control Report

Steven Fleming Apache Corp.-Midland 303 Veterans Airpark Lane Suite #3000 Midland, TX, 79705

Report Date: August 20, 2013

Work Order: 13080506

Project Location: Apache H. Corrigan Lease Battery
Project Number: Apache H. Corrigan Lease Battery

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

			Date	1 ime	Date
Sample	Description	Matrix	Taken	Taken	Received
337506	Center Point Surface	soil	2013-07-31	13:50	2013-08-01
337507	Center Point @ 3.5'	soil	2013-07-31	13:25	2013-08-01
337508	Center Point @4'	soil	2013-07-31	13:48	2013-08-01

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 15 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	3
Analytical Report Sample 337506 (Center Point Surface) Sample 337507 (Center Point @3.5') Sample 337508 (Center Point @4')	4 4 5 6
Method Blanks	8
QC Batch 103766 - Method Blank (1)          QC Batch 103788 - Method Blank (1)          QC Batch 104172 - Method Blank (1)	8 8 8
Laboratory Control Spikes	9
QC Batch 103766 - LCS (1) QC Batch 103788 - LCS (1) QC Batch 104172 - LCS (1) QC Batch 103766 - MS (1) QC Batch 103788 - MS (1) QC Batch 104172 - MS (1)	9 9 10 10 10
Calibration Standards	12
QC Batch 103766 - CCV (1) QC Batch 103766 - CCV (2) QC Batch 103766 - CCV (3) QC Batch 103788 - CCV (1) QC Batch 103788 - CCV (2) QC Batch 103788 - CCV (3) QC Batch 104172 - ICV (1) QC Batch 104172 - CCV (1)	12 12 12 12 13 13 13
Appendix	14
Report Definitions Laboratory Certifications Standard Flags Result Comments	14 14 14 14
Attachments	15

# Case Narrative

Samples for project were received by TraceAnalysis, Inc. on 2013-08-01 and assigned to work order 13080506. Samples for work order 13080506 were received intact at a temperature of 2.9 C.

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

		$\operatorname{Prep}$	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	88266	2013-08-19 at 11:00	$104\overline{172}$	2013-08-19 at 16:00
TPH DRO - NEW	S 8015 D	87920	2013-08-06 at 12:00	103766	2013-08-07 at 10:53
TPH GRO	S 8015 D	87938	2013-08-06 at 14:21	103788	2013-08-06 at 14:21

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 13080506 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.

Work Order: 13080506

Page Number: 4 of 15 Apache H. Corrigan Lease Battery

# Analytical Report

Sample: 337506 - Center Point Surface

Laboratory: Lubbock

Analysis:

Chloride (Titration)

QC Batch:

104172

Analytical Method: Date Analyzed:

SM 4500-Cl B

2013-08-19

Prep Method: N/AGS

Prep Batch:

Chloride

88266

Sample Preparation:

2013-08-19

Analyzed By: Prepared By:

GS

RLParameter Flag Cert Result

726

Units Dilution mg/Kg

RL5.00

Sample: 337506 - Center Point Surface

Laboratory:

Lubbock

Analysis:

TPH DRO - NEW

Analytical Method:

S 8015 D

Prep Method:

N/A Analyzed By: CM

QC Batch:

103766

Date Analyzed:

2013-08-07 2013-08-06

Prep Batch: 87920

Sample Preparation:

Prepared By:

CM

RL

Parameter Cert Units Dilution RLFlag Result  $\overline{\mathrm{DRO}}$ 1470mg/Kg 10 50.0

							Spike	Percent	Recovery
Surrogate		Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		232	mg/Kg	10	100	232	70 - 130

Sample: 337506 - Center Point Surface

Laboratory:

Lubbock

Analysis:

TPH GRO 103788

Analytical Method:

S 8015 D

Prep Method: S 5035 Analyzed By:

MT

QC Batch: Prep Batch:

87938

Date Analyzed: Sample Preparation:

2013-08-06 2013-08-06

Prepared By: MT

RL

Parameter  $\operatorname{Cert}$ Result Units Dilution RLFlag GRO < 80.0 20 4.00 mg/Kg Qr,Qs,U

	•					Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.71	mg/Kg	20	2.00	86	69.6 - 124

continued ...

Work Order: 13080506

Page Number: 5 of 15 Apache H. Corrigan Lease Battery

eamala	continued		
sample	continuea		

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
4-Bromofluorobenzene (4-BFB)	-		1.77	$\mathrm{mg/Kg}$	20	2.00	88	77.7 - 120

#### Sample: 337507 - Center Point @ 3.5'

Laboratory: Lubbock

Analysis: QC Batch:

Chloride (Titration)

Prep Batch: 88266

104172

Analytical Method: ·

Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2013-08-19

Prep Method: N/A Analyzed By:

GS

Prepared By: GS

2013-08-19

			RL			
Parameter	Flag	$\operatorname{Cert}$	Result	Units	Dilution	RL
Chloride			126	${ m mg/Kg}$	. 1	5.00

#### Sample: 337507 - Center Point @ 3.5'

Laboratory: Lubbock

Analysis: QC Batch:

Parameter

DRO

TPH DRO - NEW

Flag

103766Prep Batch: 87920

Analytical Method: Date Analyzed:

S 8015 D

2013-08-07

Units

mg/Kg

Prep Method: N/A

CM

50.0

Sample Preparation:

Result

< 50.0

RL

2013-08-06

Analyzed By: Prepared By:  ${\rm CM}$ 

Dilution RL

						Spike	Percent	Recovery
Surrogate	Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			105	mg/Kg	1	100	105	70 - 130

#### Sample: 337507 - Center Point @ 3.5'

Laboratory: Lubbock

Analysis: QC Batch:

Prep Batch: 87938

TPH GRO 103788

Analytical Method: Date Analyzed:

 $\operatorname{Cert}$ 

S 8015 D

2013-08-06 Sample Preparation: 2013-08-06 Prep Method: S 5035

Analyzed By: MT Prepared By: MT

RL

Parameter	Flag	$\operatorname{Cert}$	Result	Units	Dilution	RL
GRO	Qr,Qs,U	1	<4.00	${ m mg/Kg}$	1	4.00

Work Order: 13080506

Page Number: 6 of 15 Apache H. Corrigan Lease Battery

Surrogate	Flag	Cert	Result	Units	Dilution	${ m Spike} \ { m Amount}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.53	mg/Kg	1	2.00	76	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.12	mg/Kg	1	2.00	106	77.7 - 120
						***		

#### Sample: 337508 - Center Point @ 4'

Laboratory: Lubbock

Analysis:

Chloride (Titration)

QC Batch: 104172 Prep Batch: 88266

Analytical Method:

SM 4500-Cl B

Prep Method: N/A GS

Date Analyzed: Analyzed By: 2013-08-19 Sample Preparation: 2013-08-19

Prepared By:

	-		RL			
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	RL
Chloride			97.0	${ m mg/Kg}$	1	5.00

#### Sample: 337508 - Center Point @ 4'

Laboratory: Lubbock

TPH DRO - NEW Analysis: QC Batch: 103766 Prep Batch: 87920

Analytical Method:

S 8015 D 2013-08-07 Prep Method: N/A

Analyzed By: CMDate Analyzed: Sample Preparation: 2013-08-06 Prepared By: CM

			RL			
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	RL
DRO	U	1	< 50.0	${ m mg/Kg}$	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			106	mg/Kg	1	100	106	70 - 130

#### Sample: 337508 - Center Point @ 4'

Laboratory:

Lubbock

Analysis: QC Batch:

TPH GRO 103788

Analytical Method:

S 8015 D 2013-08-06 Prep Method: S 5035

Date Analyzed: Prep Batch: 87938 Sample Preparation: 2013-08-06

Analyzed By: MTPrepared By: MT

			$\operatorname{RL}$			
Parameter	Flag	Cert	Result	Units	Dilution	R.L
GRO	Qr,Qs,U	1	< 4.00	mg/Kg	1	4.00

Work Order: 13080506

Page Number: 7 of 15 Apache H. Corrigan Lease Battery

Surrogate	Flag	Cert	Result	Units	Dilution	$rac{ ext{Spike}}{ ext{Amount}}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.63	mg/Kg	1	2.00	82	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.11	mg/Kg	1	2.00	106	77.7 - 120

Work Order: 13080506

Page Number: 8 of 15 Apache H. Corrigan Lease Battery

## Method Blanks

Method Blank (1)

QC Batch: 103766

QC Batch:

103766

Date Analyzed:

2013-08-07

Analyzed By: CM

Prep Batch:

87920

QC Preparation:

2013-08-06

CMPrepared By:

MDL

Cert Result Units RLParameter Flag DRO < 5.22 mg/Kg 50

Spike Percent Recovery Flag Cert Result Units Dilution Amount Recovery Limits Surrogate 100 114 70 - 130 n-Tricosane 114 mg/Kg 1

Method Blank (1)

QC Batch: 103788

QC Batch: 103788 Prep Batch: 87938

Date Analyzed:

2013-08-06

Analyzed By: MT

QC Preparation: 2013-08-06

Prepared By:

MDLParameter Flag Cert Result Units RLGRO < 0.230 mg/Kg 4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)			$\frac{1.97}{2.03}$	mg/Kg mg/Kg	1 1	2.00 2.00	98 102	69.6 - 124 77.7 - 120

Method Blank (1)

QC Batch: 104172

QC Batch: 104172 Date Analyzed: 2013-08-19 Analyzed By: GS

Prep Batch: 88266

QC Preparation:

2013-08-19

Prepared By: GS

MDL Parameter Flag Cert Result Units RLChloride < 3.05mg/Kg

Work Order: 13080506

Page Number: 9 of 15 Apache H. Corrigan Lease Battery

# Laboratory Control Spikes

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

QC Batch:

103766

Date Analyzed:

2013-08-07

Analyzed By: CM

Prep Batch: 87920

QC Preparation: 2013-08-06

Prepared By: CM

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	С.	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$
DRO		1	268	mg/Kg	1	250	< 5.22	107	70 - 130

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	$\operatorname{Limit}$
DRO		1	262	mg/Kg	1	250	< 5.22	105	70 - 130	2	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	${f Amount}$	Rec.	Rec.	Limit
n-Tricosane	98.2	101	mg/Kg	1	100	98	101	70 - 130

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

QC Batch:

103788

Date Analyzed:

2013-08-06

Analyzed By: MT

Prep Batch: 87938

QC Preparation: 2013-08-06

Prepared By: MT

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
GRO		1	15.5	${ m mg/Kg}$	1	20.0	< 0.230	78	66.9 - 120

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.	$\operatorname{Limit}$	RPD	Limit
GRO		1	16.8	mg/Kg	1	20.0	< 0.230	84	66.9 - 120	8	20

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

	LCS	LCSD			$_{ m Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.87	1.86	mg/Kg	.1	2.00	94	93.	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.14	2:12	${ m mg/Kg}$	1	2.00	107	106	77.7 - 120

Work Order: 13080506

Page Number: 10 of 15 Apache H. Corrigan Lease Battery

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

QC Batch: Prep Batch: 88266

104172

Date Analyzed:

2013-08-19 QC Preparation: 2013-08-19

Analyzed By: GS Prepared By: GS

Rec.

LCS Spike Matrix Param Units Amount Result F  $\mathbf{C}$ Result Dil Rec. Limit Chloride 100 < 3.05 101 85 - 115 101 mg/Kg

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

			LCSD			Spike	Matrix		$\operatorname{Rec}$ .		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$_{ m Limit}$
Chloride			101	mg/Kg	1	100	< 3.05	101	85 - 115	0	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: 337508

QC Batch:

103766

Date Analyzed:

2013-08-07

Analyzed By: CM

Prep Batch: 87920

QC Preparation: 2013-08-06

Prepared By: CM

			MS			$_{ m Spike}$	Matrix		Rec.
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	249	m mg/Kg	1	250	< 5.22	100	70 - 130

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

			MSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	253	mg/Kg	1	250	< 5.22	101	70 - 130	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	$\operatorname{Limit}$
n-Tricosane	104	106	mg/Kg	1	100	104	106	70 - 130

Matrix Spike (MS-1) Spiked Sample: 337579

QC Batch:

103788

Date Analyzed:

2013-08-06

Analyzed By: MT

Prep Batch: 87938

QC Preparation: 2013-08-06

Prepared By: MT

Work Order: 13080506

Page Number: 11 of 15 Apache H. Corrigan Lease Battery

Param GRO	Qs	F Qs	<u>C</u>	·MS Resu 28.6	lt Uı	nits /Kg	Dil.	Aı	Spike mount 20.0	Re	trix sult 5.8	Rec.	)	Rec. Limit 8 - 120
Percent recovery is based on	the spil		ılt. I	RPD is ba			ke and	spike	duplica	ate res	sult.			
		٠.		MSD			Spike	e N	Aatrix (		R	ec.		RPD
Param		F	$^{\rm C}$	Result	Units	Dil.	Amou	nt I	Result	Rec.	Liı	mit	RPD	$\operatorname{Limit}$
GRO	Qr,Qs	Qr,Qs	1	45.9	mg/Kg	5	20.0		65.8	-98	38.8	- 120	46	20
Percent recovery is based on	the spil	ke rest	ılt. I	RPD is ba	ased on tl	he spi	ke and	spike	duplica	ate res	ult.			
·				MS	MSD				Sp	ike	MS	MSI	)	Rec.
Surrogate				Result	Result	t (	Jnits	Dil.	Amo	ount	Rec.	Rec	. 3	Limit
Trifluorotoluene (TFT)	Qs	r Qsı		0.704	1.79	m	ig/Kg	5	2	2	35	90	69.	6 - 124
4-Bromofluorobenzene (4-BF)	B) Qs	r Qsı		2.71	3.24	m	ıg/Kg	5	2	2	136	162	77.	7 - 120

Matrix Spike (MS-1) Spiked Sample: 337508

QC Batch: 104172

Date Analyzed: 2013-08-19

Analyzed By: GS

Prep Batch: 88266

QC Preparation: 2013-08-19

Prepared By: G

MS Spike Matrix Rec. Param $\mathbf{C}$ Result Units Amount Result Rec. Limit Chloride 605 mg/Kg 500 97 102 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.	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	, RPD	Limit
Chloride			610	mg/Kg	1	500	97	103	80 - 120	1	20

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

Work Order: 13080506

Page Number: 12 of 15 Apache H. Corrigan Lease Battery

# Calibration Standards

#### Standard (CCV-1)

QC Batch: 103766

Date Analyzed: 2013-08-07

Analyzed By: CM

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	ıng/Kg	250	267	107	80 - 120	2013-08-07

#### Standard (CCV-2)

QC Batch: 103766

Date Analyzed: .2013-08-07

Analyzed By: CM

				$\operatorname{CCVs}$	CCVs	CCVs	Percent	
•		•		True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	262	105	80 - 120	2013-08-07

#### Standard (CCV-3)

QC Batch: 103766

Date Analyzed: 2013-08-07

Analyzed By: CM

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	282	113	80 - 120	2013-08-07

#### Standard (CCV-1)

QC Batch: 103788

Date Analyzed: 2013-08-06

Analyzed By: MT

				CCVs	CCVs	CCVs .	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.976	98 -	80 - 120	2013-08-06

Work Order: 13080506

Page Number: 13 of 15 Apache H. Corrigan Lease Battery

Standard (Co	CV-2)
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QC Batch: 103788

Date Analyzed: 2013-08-06

Analyzed By: MT

	•			CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	${ m mg/Kg}$	1.00	0.977	98	80 - 120	2013-08-06

#### Standard (CCV-3)

QC Batch: 103788

Date Analyzed: 2013-08-06

Analyzed By: MT

				CCVs True	CCVs . Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.915	92	80 - 120	2013-08-06

#### Standard (ICV-1)

QC Batch: 104172

Date Analyzed: 2013-08-19

Analyzed By: GS

				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2013-08-19

#### Standard (CCV-1)

QC Batch: 104172

Date Analyzed: 2013-08-19

Analyzed By: GS

				CCVs	CCVs	$\mathrm{CCVs}$	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	$\operatorname{Cert}$	$\operatorname{Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	98.0	98	85 - 115	2013-08-19

Report Date: August 20, 2013 Work Order: 13080506 Page Number: 14 of 15 Apache H. Corrigan Lease Battery Apache H. Corrigan Lease Battery

# **Appendix**

### Report Definitions

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

### **Laboratory Certifications**

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

### Standard Flags

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

#### Result Comments

Work Order: 13080506 Page Number: 15 of 15 Apache H. Corrigan Lease Battery

1 Sample dilution due to surfactants.

### Attachments

The scanned attachments will follow this page.

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

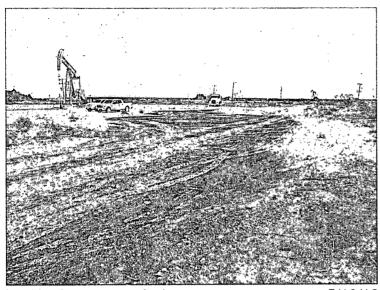
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RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

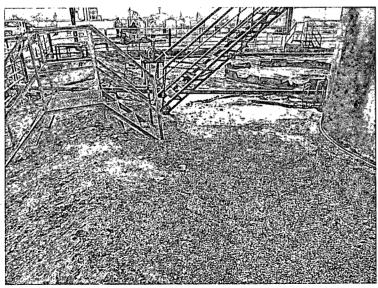
# **Apache H Corrigan Battery AD**

Unit Letter G, Section 4, T22S, R37E



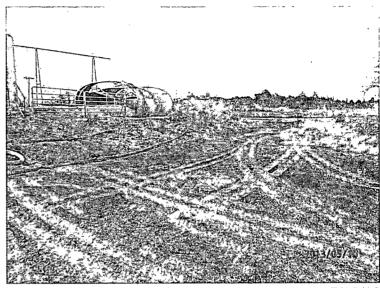
Initial release area, facing east

5/10/13



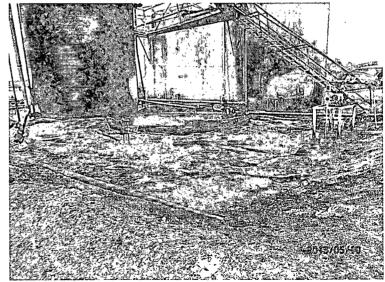
Initial release area, facing northwest

5/10/13



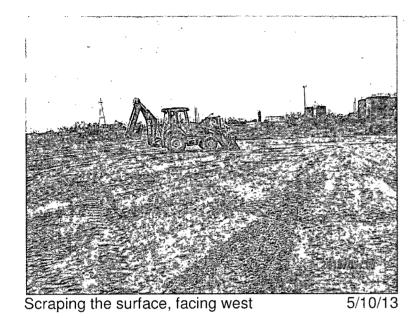
Initial release area, facing east

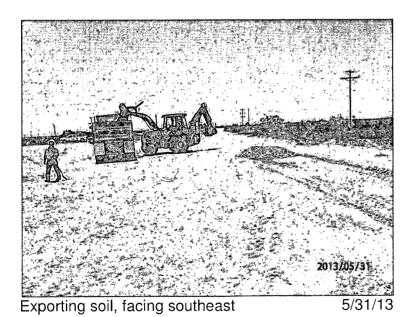
5/10/13



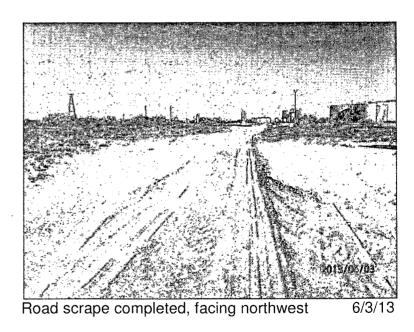
Initial release area, facing northeast

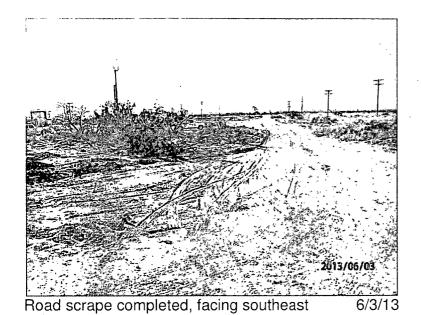
5/10/13



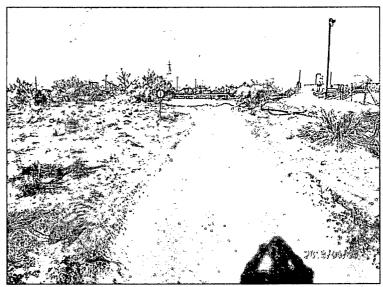


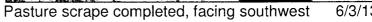


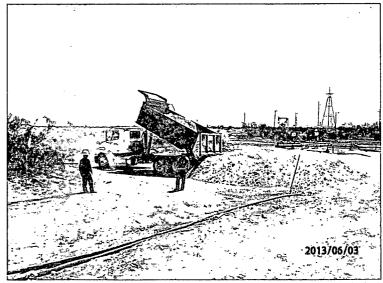




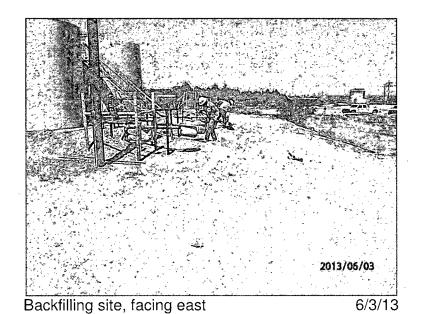


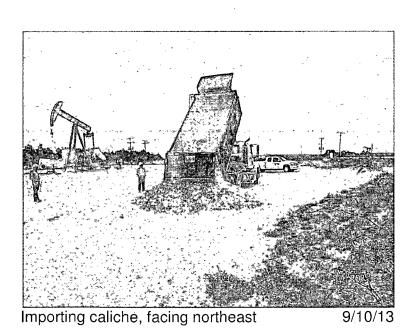


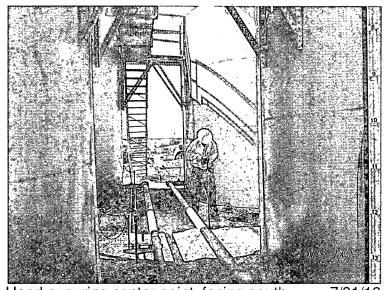


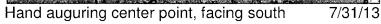


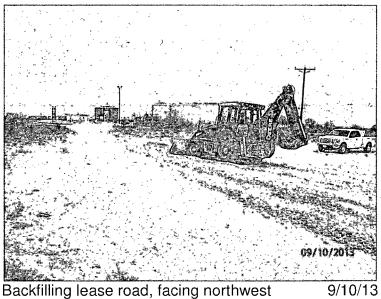
Importing soil, facing southwest 6/3/13



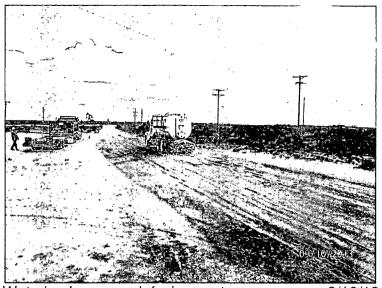






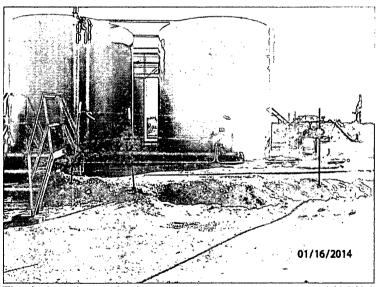


Backfilling lease road, facing northwest



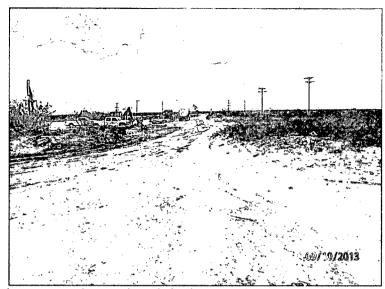
Watering lease road, facing east

9/10/13



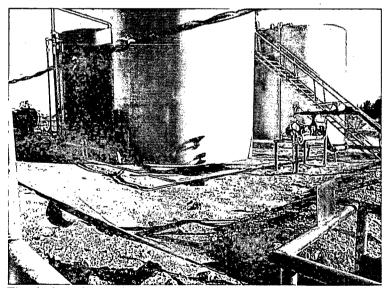
Final site photo, facing east

1/16/14



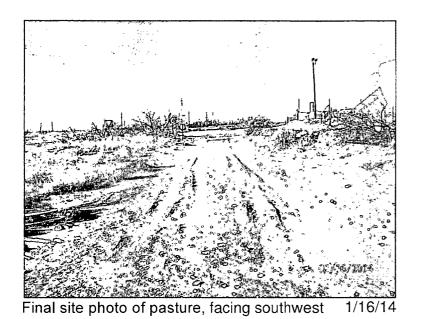
Lease road completed, facing southeast

9/10/13



Final site photo, facing northeast

1/16/14



O1/16/201

Final site photo, facing northeast 1/16/14