

CORRECTIVE ACTION REPORT

Property:

1009 Relief Valve Overspray 32.393580, -103.770060 SW¼ NW ¼, S15 T22S R31E Eddy County, New Mexico ECIRTS: 25361 2RP-2915

November 2015 Apex Project No. 7250715028.001

Prepared for:

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1.0 INTRODUCTION

1.1 Site Description & Background

The 1009 Relief Valve Overspray Release Site is located within the Enterprise Field Services, LLC (Enterprise) pipeline right-of-way (ROW) in the southwest (SW) ¼ of the northwest (NW) ¼ of Section 15 in Township 22 South and Range 31 East in rural Eddy County, New Mexico (32.393580N, 103.770060W), referred to hereinafter as the "Site" or "subject Site". The Site is located north of an unpaved road on Bureau of Land Management (BLM) managed lands. The Site is surrounded by native rangeland with oil and gas production and gathering facilities, including the 1009 Enterprise natural gas gathering pipeline. The Site is located approximately two (2) miles northeast of the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP), located on BLM managed property.

On March 10, 2015, Enterprise was notified by the BLM of an overspray caused by a pressure relief valve activation on the 1009 natural gas gathering line. The release through the pressure relief valve consisted of natural gas (immediately dispersed into the atmosphere) and natural gas pipeline liquids. The contamination from the overspray was located north of the pipeline ROW. An area of liquid contamination (liquid flow area) was observed around the valve on the ground surface and remained on the pipeline ROW. Pipeline liquids also flowed west down the lease road. Two fluid spray areas were noted which extend to the northeast and the northwest of the release point. Surface impacts of the spray area were approximately 3.6 acres to the northwest and approximately 1.7 acres to the northeast.

A topographic map depicting the location and approximate area of the surface indication of the impact is shown of the Site is included as Figure 1, and a Site Vicinity Map is included as Figure 2 in Appendix A.

1.2 Project Objective

The primary objective of the corrective actions was to reduce the concentration of constituents of concern (COCs) in on-Site soils to below the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD), Oil Conservation Division (OCD) *Remediation Action Levels* using the New Mexico EMNRD OCD's *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.



2.0 SITE RANKING

In accordance with the New Mexico EMNRD OCD's *Guidelines for Remediation of Leaks, Spills and Releases, Apex TITAN, Inc. (Apex) utilized the general site characteristics obtained during the completion of corrective action activities and information available from the New Mexico Office of the State Engineer (OSE) to determine the appropriate "ranking" for the Site. The ranking criteria and associated scoring are provided in the following table:*

Ranking Criteria			Ranking Score
	<50 feet	20	
Depth to Groundwater	50 to 99 feet	10	0
	>100 feet	0	
Wellhead Protection Area <1,000 feet from a water	Yes	20	
source, or; <200 feet from private domestic water source.	No	0	0
Distance to Surface Water	<200 feet		
Body	200 to 1,000 feet	10	0
Воду	>1,000 feet	0	
Total Ranking Score			0

Based on Apex's evaluation of the scoring criteria, the Site would have a maximum Total Ranking Score of "0". This ranking is based on the following:

- The approximate depth to the initial groundwater-bearing zone is greater than 100 feet at the Site.
- No water source wells (municipal/community wells) were identified within 1,000 feet of the Site. No private domestic water sources were identified within 200 feet of the Site.
- The distance to the nearest surface water body is greater than 1,000 feet.

Based on a Total Ranking Score of "0", cleanup goals for soils remaining in place include:

- 10 milligrams per kilogram (mg/Kg) for benzene
- 50 mg/Kg for total benzene, toluene, ethylbenzene and xylene (BTEX)
- 5,000 mg/Kg for total petroleum hydrocarbons (TPH)
- 1,000 mg/Kg for chloride.



3.0 **RESPONSE ACTIONS**

3.1 Soil Remediation Activities

On March 20, 2015, Enterprise and Apex conducted an initial site investigation. BLM and United States DOE WIPP representatives were on site to observe initial confirmation sampling of the fluid stained areas near the relief valve and site investigation activities. The perimeters of the two spray areas were delineated and a remediation plan was created to treat the soils and vegetation in-situ, which were affected by the relief valve overspray.

The area of liquid contamination was observed around the valve and remained on the existing pipeline ROW, flowing west down the lease road. Fluid staining measuring approximately 145 feet long by three (3) feet wide was observed on the ground surface. The pipeline ROW is fifty (50) feet wide perpendicular to the length of the pipeline.

Surface staining of the spray area was observed on the ground surface and extended to the northeast and northwest of the pressure relief valve, outside of the pipeline ROW. The northeast spray area measured approximately 160 feet wide by 920 feet long. The northwest spray area measured approximately 160 feet wide by 420 feet long.

From March 30 through April 1, 2015, Apex returned to the Site to conduct in-situ soil remediation activities. Ikon Environmental Solutions, LP (Ikon) applied a microbial-decomposition product (Microblaze®) to introduce additional nonpathogenic bacterial strains designed to metabolize petroleum hydrocarbons to the spray areas and the affected area surrounding the pressure relief valve. On-Site equipment, located in the vicinity of the relief valve, and cattle pens, located to the northwest of the relief valve, were power-washed with a heated Microblaze solution.

3.2 Soil Sampling Program

On March 20, 2015, Apex collected three (3) confirmation soil samples (CS-1 through CS-3) from the affected area where pipeline liquids were observed flowing from the relief valve westward down the pipeline ROW to establish baseline conditions subsequent to the release.

On May 6, 2015, Apex collected 22 confirmation soil samples (CS-1 through CS-22) and 22 vegetation samples (Veg-1 through Veg-22) from the northwest and northeast spray areas following the application of Microblaze®. Due to the size of the spray areas, each area was divided into 22 separate grid areas. A sample was collected from the surface every 100 foot interval within the spray areas. The sampled vegetation was limited to forage species based on the concern of the grazing livestock that may inhabit the area. The BLM and WIPP were notified by Enterprise 48 hours prior to the collection of the confirmation soil and vegetation samples.

On June 10, 2015, Apex returned to the Site and resampled vegetation (Veg-14 through Veg-16) after lab results indicated elevated levels of TPH based on the previously submitted samples. The vegetation samples were collected five (5) weeks after the initial Microblaze application, allowing the bacterial strains in the Microblaze additional time to metabolize petroleum hydrocarbons in the affected spray areas. The BLM and WIPP were notified by Enterprise 48 hours prior to the collection of the vegetation samples.



Samples were collected and delivered under chain of custody control to Trace Analysis laboratory in Midland, Texas for analysis of BTEX utilizing EPA SW-846 Method #8021B, TPH gasoline range organics (GRO) and diesel range organics (DRO) utilizing EPA SW-846 Method #8015 and chloride utilizing EPA Method SM 4500-CI B.

Executed chain-of-custody form and laboratory data sheets are provided in Appendix D. All samples were analyzed within specified holding times.

Figure 3A is a site map indicating the extent of the spray area in relation to the excavation. Figure 3B is a Site detail map that indicates the approximate location of liquid flow area in relation to the relief valve and pertinent land features (Appendix A).

4.0 DATA EVALUATION

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. To address activities related to condensate releases, the New Mexico EMNRD OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the OCD rules, specifically NMAC 19.15.29 *Remediation Plan.* These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

4.1 Analytical Results

Apex compared the benzene, BTEX, TPH and chloride results associated with the confirmation soil samples collected from the liquid flow area (CS-1 through CS-3), the confirmation soil samples taken from the spray areas (CS-1 through CS-22) and vegetation samples (Veg-1 through Veg-22) to the OCD *Recommended Remediation Action Levels* (RRALs) for sites having a total ranking score of "0".

The laboratory analyses of confirmation soil samples collected from the liquid flow area (CS-1 through CS-3) indicate benzene, BTEX and combined TPH GRO/DRO concentrations are below the laboratory reporting limits, which are below the OCD RRAL limits of 10 mg/Kg for a Site ranking of "0".

The laboratory analyses for confirmation soil samples (CS-1 through CS-3) collected from the liquid flow area indicate chloride concentrations of 870 mg/Kg, 1,260 mg/Kg and 580 mg/Kg, respectively. The confirmation soil sample chloride concentrations are below the OCD RRAL limits of 1,000 mg/Kg, with the exception of CS-2. However, due to the levels of groundwater in the vicinity of the site being greater than one hundred (100) feet below ground surface, it is likely that the remaining concentration will decline at depth and be protective of groundwater.

Confirmation soil sample CS-1 was analyzed for Toxicity Characteristic Leach Procedure (TCLP) heavy metals for waste disposal purposes based on initial confirmation soil sample results from the liquid flow area.



The laboratory analyses of the confirmation soil samples (CS-1 through CS-22) collected from the overspray areas indicate total BTEX concentrations are below the laboratory reporting limits, which are below the OCD RRAL limits of 50 mg/Kg for a Site ranking of "0". The laboratory analyses of the confirmation soil samples indicate combined TPH GRO/DRO concentrations ranging from below the laboratory reporting limits to 418 mg/Kg, which are below the OCD RRAL limit of 5,000 mg/Kg for a Site ranking of "0". The laboratory analyses of the confirmation soil samples indicate chord reporting limits to 418 mg/Kg, which are below the OCD RRAL limit of 5,000 mg/Kg for a Site ranking of "0". The laboratory analyses of the confirmation soil samples indicate chloride concentrations ranging from below the laboratory reporting limits to 600 mg/Kg, which are below the OCD RRAL limit of 1,000 mg/Kg.

The laboratory analyses of the initial vegetation samples (Veg-1 through Veg-13 and Veg-17 through Veg-22) indicate total combined TPH GRO/DRO concentrations ranging from 160 mg/Kg to 2,800 mg/Kg, which is below the OCD RRAL limit of 5,000 mg/Kg. The laboratory analyses of the initial vegetation samples (Veg-14, Veg-15 and Veg-16) indicate total combined TPH GRO/DRO concentrations ranging from 7,630 mg/Kg to 27,500 mg/Kg, which are above the OCD RRAL limit of 5,000 mg/Kg for a Site ranking of "0". The laboratory analyses of the additional vegetation samples (Veg-14, Veg-15 and Veg-16) indicate total combined TPH GRO/DRO concentrations ranging from 168 mg/Kg to 2,800 mg/Kg, which are below the OCD RRAL limit. The additional vegetation samples (Veg-14, Veg-15 and Veg-16) indicate total combined TPH GRO/DRO concentrations ranging from 168 mg/Kg to 2,800 mg/Kg, which are below the OCD RRAL limit. The additional vegetation samples (Veg-14, Veg-15 and Veg-16) were collected five (5) weeks after the initial Microblaze application to the spray areas, allowing the bacterial strains in the Microblaze additional time to metabolize petroleum hydrocarbons in the affected spray areas. As a result, the additional vegetation samples (Veg-14, Veg-15 and Veg-16) indicate TPH concentrations below the OCD RRAL limit of 5,000 mg/Kg for a Site raking of "0".

Analytical results for confirmation soil samples collected from the liquid flow area are provided in Table 1 in Appendix C. Confirmation soil sample and vegetation sample results from areas affected by the overspray are provided in Table 2 in Appendix C.

5.0 FINDINGS AND RECOMMENDATIONS

The 1009 Relief Valve Overspray Release Site is located within the Enterprise pipeline ROW in rural Eddy County, New Mexico. The Site is located north of an unpaved road on BLM managed lands. The Site is surrounded by native vegetation rangeland with oil and gas production and gathering facilities, including the 1009 Enterprise natural gas gathering pipeline. The Site is located approximately two (2) miles northeast of the U.S. DOE WIPP, located on BLM managed property.

On March 10, 2015, Enterprise was notified by BLM of an overspray caused by a pressure relief valve activation on the 1009 natural gas gathering line. The release through the pressure relief valve consisted of natural gas (immediately dispersed into the atmosphere) and natural gas pipeline liquids. The contamination from the overspray was located north of the pipeline ROW. An area of liquid contamination was observed around the valve on the ground surface and remained on the ROW, flowing west down the lease road. Two fluid spray areas were noted which extend to the northeast and the northwest. Surface impacts of the spray area are approximately 3.6 acres to the northwest and approximately 1.7 acres to the northeast.

• The primary objective of the corrective actions was to reduce the concentration of COCs in the on-Site soils to below the New Mexico EMNRD OCD *RALs* using the New Mexico EMNRD OCD's *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.



- On-Site remediation included application of Microblaze to the spray areas and the affected area surrounding the pressure relief valve. On-site equipment located in the vicinity of the relief valve and cattle pens, located to the northwest of the relief valve, were power-washed with a hot Microblaze®.
- A total of three (3) confirmation soil samples were collected from the liquid flow area. A total of 22 confirmation soil samples and 22 vegetation samples were collected from the spray area for laboratory analyses. An additional three (3) vegetation samples were resampled after laboratory analysis of the initial vegetation samples. Based on analytical results, soils and vegetation remaining in place do not exhibit COC concentrations above the OCD *Remediation Action Levels* for a Site ranking of "0"

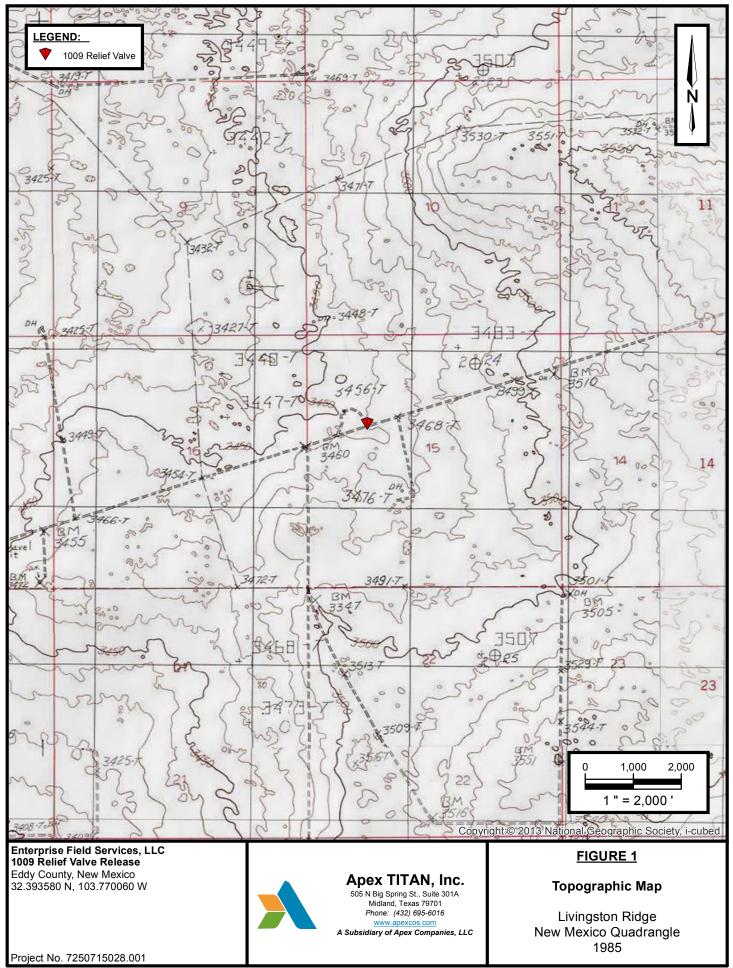
Based on field observations and laboratory analytical results, no additional investigation or corrective action appears warranted at this time.

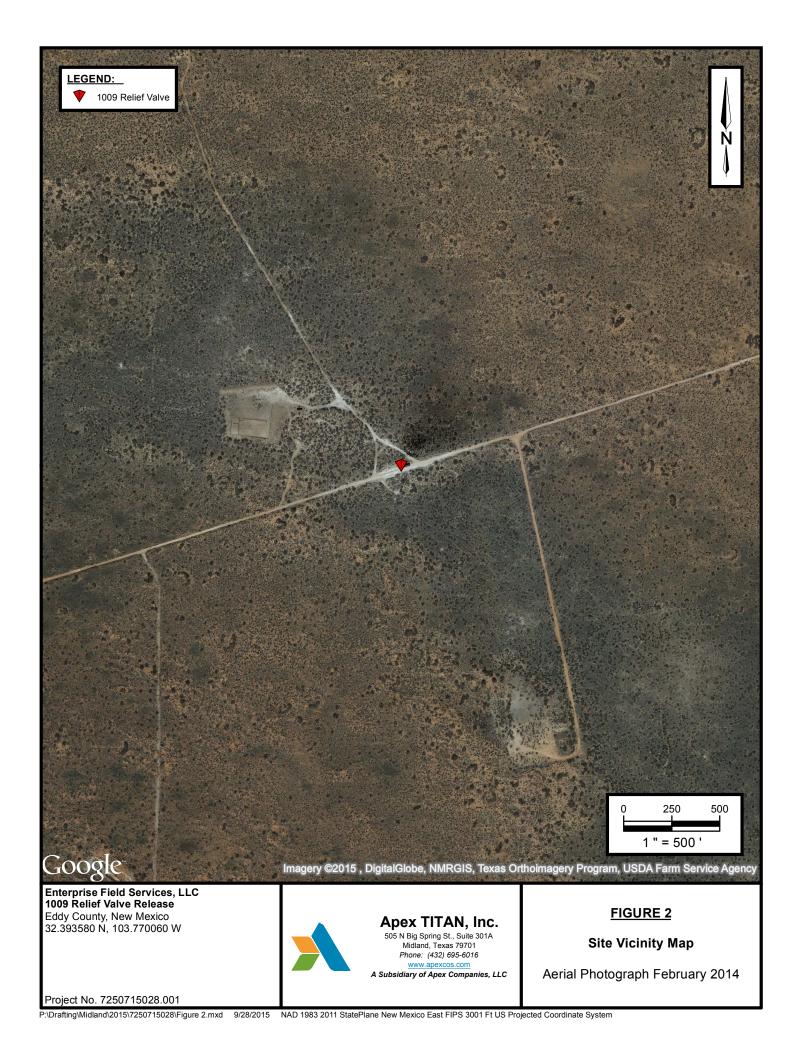


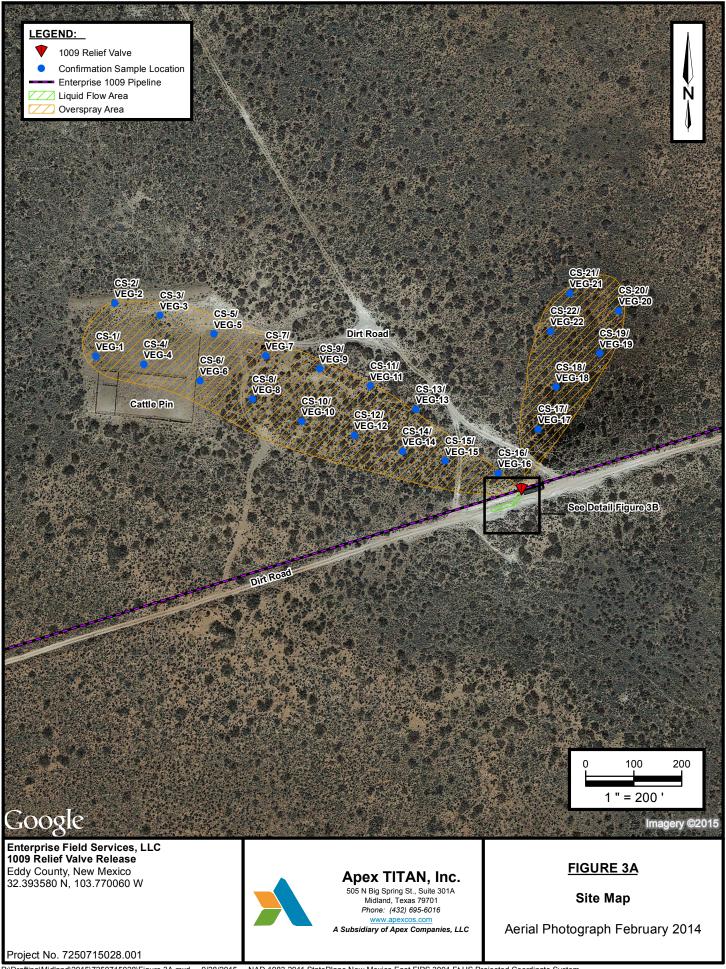


APPENDIX A

Figures







P:\Drafting\Midland\2015\7250715028\Figure 3A.mxd 9/28/2015 NAD 1983 2011 StatePlane New Mexico East FIPS 3001 Ft US Projected Coordinate System



P:\Drafting\Midland\2015\7250715028\Figure 3B.mxd 9/28/2015 NAD 1983 2011 StatePlane New Mexico East FIPS 3001 Ft US Projected Coordinate System



APPENDIX B

Photographic Documentation



View looking west of relief valve and northwest overspray area prior to remediation activities.



Close up view of on Site equipment prior to remediation activities.



View looking west of liquid flow area.



View looking northeast of northeast spray area.



View looking north of Microblaze application near cattlepen area.



View of Microblaze application in northeast spray area.





APPENDIX C

Analytical Tables



TABLE 1 - PIPELINE LIQUIDS RELEASE SOIL SAMPLE ANALYTICAL RESULTS 1009 Relief Valve Release

Sample I.D. New Mexico Oil Con	Sample Date	Sample Depth (feet bgs)	Benzene (mg/Kg) Action Levels	Toluene (mg/Kg) (RRALs) (Total	Ethylbenzene (mg/Kg) Ranking Score: (Xylenes (mg/Kg) 0)	BTEX (mg/Kg)	TPH GRO (mg/Kg)	TPH DRO (mg/Kg)	TPH GRO/DRO (mg/Kg)	Chloride (mg/Kg)
New Mexico C	New Mexico Oil Conservation Division (NMOCD) Recomended Remediation Action Level		10	NE	NE	NE	50	NE	NE	1,000	1,000
			LIQUID FLOW	V AREA CONFI	RMATION SOIL S	AMPLES					
CS-1	3/20/2015	1'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	<54.0	870
CS-2	3/20/2015	1'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	<54.0	1,260
CS-3	3/20/2015	1'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	<54.0	580

mg/Kg- milligrams per Kilograms

Note: Concentrations in **bold** and yellow exceed the applicable OCD Remediation Action Level

NE: Not Established

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Sample I.D.	Sample Date	SO Sample Depth (inches bgs)	IL AND VEGE		RSPRAY AF PLE ANALYTIC, alve Release Ethylbenzene (mg/Kg)		BTEX (mg/Kg)	TPH GRO	TPH DRO	TPH GRO/DRO	Chloride
								(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
New Mexico Oil Con	servation Division (NMOCD) Recomended Remediation	Action Levels (RRALs) (Total I	Ranking Score: 0)						
New Mexico Oil Con	servation Division (NMOCD Action Level) Recomended Remediation	10	NE	I	NE	50	NE	NE	5,000	1,000
		SPRA	Y AREA CONF	RMATION SOIL	SAMPLE ANALY	TICAL RESULTS	;				
CS-1	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-2	5/6/2015	.25	<0.0400	<0.0400	<0.0400	<0.0400	<0.1600	<8.00	<50.0	<58.00	<20.0
CS-3	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-4	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	600
CS-5	5/6/2015	.25	<0.0400	< 0.0400	< 0.0400	<0.0400	<0.1600	<8.00	<50.0	<58.00	<20.0
CS-6	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-7	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-8	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	103	103	<20.0
CS-9	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	133	133	<20.0
CS-10	5/6/2015	.25	<0.0400	<0.0400	<0.0400	<0.0400	<0.1600	<8.00	<50.0	<58.00	<20.0
CS-11	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	272	272	<20.0
CS-12	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-13	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-14	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-15	5/6/2015	.25	<0.0400	<0.0400	<0.0400	<0.0400	<0.1600	<8.00	418	418	<20.0
CS-16	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	126	126	98.0
CS-17	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	131	131	98.0
CS-18	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	66.7	66.7	<20.0
CS-19	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	287
CS-20	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	<20.0
CS-21	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	96.0
CS-22	5/6/2015	.25	<0.0200	<0.0200	<0.0200	<0.0200	<0.0800	<4.00	<50.0	<54.0	574
	 1				MPLE ANALYTIC			1			
Veg-1	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	370	370	NA
Veg-2	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	484	484	NA
Veg-3	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	662	662	NA
Veg-4	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	340	340	NA
Veg-5	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,380	1,380	NA
Veg-6	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	876	876	NA
Veg-7	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	668	668	NA
Veg-8	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	929	929	NA
Veg-9	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,830	1,830	NA

TABLE 2 - OVERSPRAY AREA SOIL AND VEGETATION SAMPLE ANALYTICAL RESULTS 1009 Relief Valve Release											
Sample I.D.	Sample Date	Sample Depth (inches bgs)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	BTEX (mg/Kg)	TPH GRO	TPH DRO	TPH GRO/DRO	Chloride
								(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
New Mexico Oil Con	servation Division (NMOCD)	Recomended Remediation	Action Levels (RRALs) (Total I	Ranking Score: 0)	· · · · · · · · · · · · · · · · · · ·	-	•	-	•	
New Mexico Oil Con	nservation Division (NMOCD) Action Level	Recomended Remediation	10	NE	I	NE	50	NE	NE	5,000	1,000
Veg-10	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,190	1,190	NA
Veg-11	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,350	1,350	NA
Veg-12	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,360	1,360	NA
Veg-13	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	2,600	2,600	NA
Veg-14	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	7,630*	7630*	NA
Veg-14	6/10/2015	NA	NA	NA	NA	NA	NA	<8.00	168	168	NA
Veg-15	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	27,500*	27,500*	NA
Veg-15	6/10/2015	NA	NA	NA	NA	NA	NA	<8.00	2,510	2,510	NA
Veg-16	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	22,500*	22,500*	NA
Veg-16	6/10/2015	NA	NA	NA	NA	NA	NA	<8.00	2,800	2,800	NA
Veg-17	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	753	753	NA
Veg-18	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,620	1,620	NA
Veg-19	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	333	333	NA
Veg-20	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	186	186	NA
Veg-21	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	326	326	NA
Veg-22	5/6/2015	NA	NA	NA	NA	NA	NA	<8.00	1,210	1210	NA

Note: Concentrations in **bold** and yellow exceed the applicable OCD Remediation Action Level

mg/Kg- milligrams per Kilograms

NE: Not Established

NA: Not applicable

*Resampling of vegetation indicated bioremediation product application was successful, see confirmation samples directly below.



APPENDIX D

Laboratory Analytical Reports & Chain-of-Custody Documentation



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

Texas 79424 Lubbock, Texas 79922 El Paso, Texas 79703 Midland, Carroliton. Texas 75006

432-689-6301 972-242 -7750 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

FAX 806 • 794 • 1298 915-585-3443 FAX 915 • 585 • 4944 FAX 432 • 689 • 6313

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Karolanne Toby APEX/Titan 2351 W. Northwest Hwy. Suite 3321 Dallas, Tx, 75220

Report Date: March 27, 2015

Work Order: 15032028

Project Location: Eddy Co, NM **Project Name:** ENTERPRISE 1009 RELIEF VALVE Project Number: 7250715028.001

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
389290	CS-1		2015-03-20	13:00	2015-03-20
389291	CS-2		2015-03-20	13:05	2015-03-20
389292	CS-3		2015-03-20	13:10	2015-03-20

Notes

• Work Order 15032028: SAMPLES STRAIGHT FROM FIELD

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

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

Report Contents

Case Narrative	5						
Analytical Report Sample 389290 (CS-1) Sample 389291 (CS-2) Sample 389292 (CS-3)	6 6 7 9						
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QC Batch 120168 - LCS (1)	14 14 15 15 16 16						
QC Batch 120168 - MS (1)	 18 18 19 19 20 20 						
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Case Narrative

Samples for project ENTERPRISE 1009 RELIEF VALVE were received by TraceAnalysis, Inc. on 2015-03-20 and assigned to work order 15032028. Samples for work order 15032028 were received intact at a temperature of 11.4 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
Ag, Total	S 6010C	101746	2015-03-25 at 11:20	120321	2015-03-26 at 17:08
As, Total	S $6010C$	101746	2015-03-25 at $11:20$	120321	2015-03-26 at $17:08$
Ba, Total	S 6010C	101746	2015-03-25 at $11:20$	120321	2015-03-26 at $17:08$
BTEX	S 8021B	101644	2015-03-20 at $07:53$	120168	2015-03-23 at $07:26$
Cd, Total	S 6010C	101746	2015-03-25 at $11:20$	120321	2015-03-26 at $17:08$
Chloride (Titration)	SM 4500-Cl B $$	101679	2015-03-23 at $09:38$	120172	2015-03-23 at $09:38$
Cr, Total	S 6010C	101746	2015-03-25 at $11:20$	120321	2015-03-26 at $17:08$
Hg, Total	S 7471 B	101783	2015-03-26 at $10:15$	120304	2015-03-26 at $13:36$
Pb, Total	S 6010C	101746	2015-03-25 at 11:20	120321	2015-03-26 at $17:08$
Se, Total	S 6010C	101746	2015-03-25 at 11:20	120321	2015-03-26 at $17:08$
TPH DRO - NEW	S 8015 D	101678	2015-03-23 at $09:09$	120180	2015-03-23 at $12:11$
TPH GRO	S 8015 D	101644	2015-03-20 at $07:53$	120169	2015-03-23 at 07:31

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 15032028 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Analytical Report

Sample: 389290 - CS-1

Laboratory: Analysis: QC Batch: Prep Batch:	Midland BTEX 120168 101644		Analytical Date Anal Sample Pr		S 802 2015-0 2015-0	03-23		Prep Method Analyzed By: Prepared By:	AK
					RL				
Parameter		Flag	Cert		Result	Units		Dilution	RL
Benzene		U	5		0.0200	m mg/Kg		1	0.0200
Toluene		U	5		0.0200	m mg/Kg		1	0.0200
Ethylbenzene		U	5		0.0200	m mg/Kg		1	0.0200
Xylene		U	5	<().0200	mg/Kg		1	0.0200
Surrogate Trifluorotolue 4-Bromofluoro	ene (TFT) obenzene (4-BFB)	Fla	g Cert	Result 1.71 2.13	Units mg/Kg mg/Kg		Spike Amount 2.00 2.00	Percent Recovery 86 106	Recovery Limits 70 - 130 70 - 130
Sample: 389	9290 - CS-1								
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration 120172 101679	1)	Date	ytical Metl Analyzed: ple Prepara	:	SM 4500-Cl B 2015-03-23 2015-03-23		Prep Metho Analyzed E Prepared B	y: EM
					RL				
Parameter		Flag	Cert	R	esult	Units		Dilution	RL
Chloride					870	mg/Kg		5	4.00

Sample: 389290 - CS-1

Laboratory: Analysis: QC Batch:	Lubbock Total 8 Metals 120304	Analytical Method: Date Analyzed:	S 7471 B 2015-03-26	Prep Method: Analyzed By:	N/ATP
Prep Batch:	101783	Sample Preparation:	2015-03-26	Prepared By:	TP
Laboratory:	Lubbock				
Analysis:	Total 8 Metals	Analytical Method:	S 6010C	Prep Method:	S $3050B$
QC Batch:	120321	Date Analyzed:	2015-03-26	Analyzed By:	LM
Prep Batch:	101746	Sample Preparation:	2015-03-25	Prepared By:	LM

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			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,6	< 0.500	mg/Kg	1	0.500
Total Arsenic	U	1,2,3,4,6	$<\!2.00$	mg/Kg	1	2.00
Total Barium		1,2,3,4,6	64.4	mg/Kg	1	1.00
Total Cadmium	U	1,2,3,4,6	< 0.500	mg/Kg	1	0.500
Total Chromium		1,2,3,4,6	4.42	mg/Kg	1	0.500
Total Mercury	U	1,2,3,4,6	< 0.0250	mg/Kg	1	0.0250
Total Lead	U	1,2,3,4,6	<1.00	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,6	$<\!2.00$	mg/Kg	1	2.00

Sample: 389290 - CS-1

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NI 120180 101678	EW	Date	lytical Metho e Analyzed: ple Preparat	2015-0)3-23	Prep Me Analyzee Preparec	ł By: SC
					RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO		U	5	<5	0.0	m mg/Kg	1	50.0
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			122	m mg/Kg	1	100	122	70 - 130

Sample: 389290 - CS-1

Laboratory:MidlandAnalysis:TPH GROQC Batch:120169Prep Batch:101644			Date An	al Methoo alyzed: Preparatio	2015-0 on: 2015-0	3-23		Prep Metho Analyzed B Prepared B	y: AK
			~		RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	$_{\mathrm{Qs,U}}$		5		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.78	mg/Kg	1	2.00	89	70 - 130
4-Bromofluorobenzene (4-BFB)				2.05	mg/Kg	1	2.00	102	70 - 130

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7250715028.001	ENTERPRISE 1009 RELIEF VALVE	Eddy Co, NM

Sample: 389291 - CS-2

Laboratory: Midland Analysis: BTEX QC Batch: 120168 Prep Batch: 101644		Date Ana	l Method: lyzed: reparation	S 8021F 2015-03 : 2015-03	-23		Prep Method Analyzed By Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Units	3	Dilution	RL
Benzene	U	5	<	0.0200	mg/Kg	s	1	0.0200
Toluene	U	5	<	0.0200	mg/Kg	S	1	0.0200
Ethylbenzene	U	5	<	0.0200	m mg/Kg	S	1	0.0200
Xylene	U	5	<	0.0200	m mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.64	mg/Kg	1	2.00	82	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	$\mathrm{mg/Kg}$	1	2.00	100	70 - 130

Sample: 389291 - CS-2

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 120172 101679	Date	tical Method: Analyzed: le Preparation:	SM 4500-Cl B 2015-03-23 2015-03-23	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1260	mg/Kg	5	4.00

Sample: 389291 - CS-2

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NI 120180 101678	EW	Date	lytical Metho e Analyzed: ple Preparat	2015-0)3-23	Prep Me Analyzec Prepared	v
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO		U	5	<5	0.0	mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			126	m mg/Kg	1	100	126	70 - 130

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Sample: 389291 - CS-2										
Laboratory:MidlandAnalysis:TPH GROQC Batch:120169Prep Batch:101644			Date An	al Metho alyzed: Preparatio	2015-0	3-23		Prep Metho Analyzed B Prepared B	y: AK	
					RL					
Parameter	Flag		Cert		Result	Unit	ts	Dilution	RL	
GRO	$_{\rm Qs,U}$		5		<4.00	mg/K	g	1	4.00	
							Spike	Percent	Recovery	
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits	
Trifluorotoluene (TFT)				1.65	mg/Kg	1	2.00	82	70 - 130	
4-Bromofluorobenzene (4-BFB)				1.87	mg/Kg	1	2.00	94	70 - 130	

Sample: 389292 - CS-3

Laboratory: Midland								
Analysis: BTEX		Analytica	l Method:	S 8021E	3		Prep Method	l: S 5035
QC Batch: 120168		Date Ana	lyzed:	2015-03	-23		Analyzed By	: AK
Prep Batch: 101644		Sample P	reparation:	: 2015-03	-20		Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	5	<	0.0200	mg/Kg	r	1	0.0200
Toluene	U	5	<	0.0200	$\mathrm{mg/Kg}$	S	1	0.0200
Ethylbenzene	U	5	<	0.0200	$\mathrm{mg/Kg}$	S	1	0.0200
Xylene	U	5	<	0.0200	mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.61	mg/Kg	1	2.00	80	70 - 130
4-Bromofluorobenzene (4-BFB)			2.06	mg/Kg	1	2.00	103	70 - 130

Sample: 389292 - CS-3

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500- $Cl B$	Prep Method:	N/A
QC Batch:	120172	Date Analyzed:	2015-03-23	Analyzed By:	EM
Prep Batch:	101679	Sample Preparation:	2015-03-23	Prepared By:	$\mathbf{E}\mathbf{M}$
-				1	

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Report Date: Mar 7250715028.001	Date: March 27, 2015 028.001			Vork Order: PRISE 1009	15032028 RELIEF VA	LVE	0	ber: 10 of 27 ddy Co, NM
sample 389292 cor	ntinued							
					RL			
Parameter		Flag	Cert	Re	sult	Units	Dilution	RL
Parameter		Flag	Cert	Re	RL sult	Units	Dilution	RL
Chloride					580	mg/Kg	5	4.00
•	land H DRO - NE 180	W	Date	lytical Meth e Analyzed: pple Prepara	2015-	03-23	Prep Me Analyzec Preparec	l By: SC
					RL			
Parameter DRO		Flag	Cert		sult 50.0	Units	Dilution	$\frac{\text{RL}}{50.0}$
DRO		U	5	<(0.0	m mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			119	m mg/Kg	1	100	119	70 - 130
Sample: 389292	- CS-3							
•			Date Ana	al Method: alyzed: Preparation:	S 8015 D 2015-03-23 2015-03-20		Prep Meth Analyzed I Prepared I	By: AK
					RL			

					RL				
Parameter	Flag		Cert		Result	Unit	ts	Dilution	RL
GRO	$_{\rm Qs,U}$		5		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0		1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)				1.92	$\mathrm{mg/Kg}$	1	2.00	96	70 - 130

Method Blanks

Method Blank (1)	QC Batch: 120168							
QC Batch: 120168		Date A	analyzed:	2015-03-2	23		Analyzed	By: AK
Prep Batch: 101644		QC Pr	eparation:	2015-03-2	20		Prepared	By: AK
					MDL			
Parameter	Flag		Cert		Result		Units	RL
Benzene			5		< 0.00533]	mg/Kg	0.02
Toluene			5		< 0.00645		mg/Kg	0.02
Ethylbenzene			5		< 0.0116	1	mg/Kg	0.02
Xylene			5		< 0.00874]	mg/Kg	0.02
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.85	mg/Kg	1	2.00	92	70 - 130
4-Bromofluorobenzene (4-	BFB)		2.01	$\mathrm{mg/Kg}$	1	2.00	100	70 - 130

Method Blank (1) QC Batch: 120169

QC Batch: 120169 Prep Batch: 101644			analyzed: eparation:	2015-03-2 2015-03-2			Analyzed I Prepared I		
					MDL				
Parameter	Flag		Cert		Result		Units	RL	
GRO			5		<2.32		mg/Kg	4	
			_			Spike	Percent	Recovery	
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits	
Trifluorotoluene (TFT)			1.84	m mg/Kg	1	2.00	92	70 - 130	
4-Bromofluorobenzene (4-BFB)			1.87	m mg/Kg	1	2.00	94	70 - 130	

Method Blar	nk (1)	QC Batch: 120172			
QC Batch: Prep Batch:			Date Analyzed: QC Preparation:	Analyzed By: Prepared By:	

Report Date: March 2 7250715028.001	7, 2015			Work Order: PRISE 1009	: 15032028) RELIEF VALV	Έ	Page Number: 12 Eddy Co,			
Parameter		Fla	g	Cert	MI Res	ult	Units	RL		
Chloride					<3.	85	mg/Kg	4		
	Batch: 120180									
Method Blank (1) QC Batch: 120180 Prep Batch: 101678	QC B	atch: 1201	Date A	J	2015-03-23 2015-03-23		Analyze Prepare	*		
QC Batch: 120180 Prep Batch: 101678	QC B		Date A QC Pı	reparation:	2015-03-23 MI		Prepare	ed By: SC		
QC Batch: 120180	QC B	Batch: 1201 Fla	Date A QC Pı		2015-03-23	ult	•	*		
QC Batch: 120180 Prep Batch: 101678 Parameter	QC B		Date A QC Pı	ceparation: Cert	2015-03-23 MI Res	ult	Prepare	ed By: SC		

Method Blank (1) QC Batch: 120304

QC Batch: 120304 Prep Batch: 101783		Date Analyzed: QC Preparation:		Analyzed E Prepared B	v
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Total Mercury		1,2,3,4,6	< 0.00325	m mg/Kg	0.025

Method Blank (1) QC Batch: 120321

QC Batch: 120321	Date A	Analyzed: 2015-0	Analyzed I	By: LM	
Prep Batch: 101746	QC Pr	eparation: 2015-0	Prepared I	By: PM	
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Total Silver		1,2,3,4,6	< 0.0344	mg/Kg	0.5
Total Arsenic		1,2,3,4,6	< 0.432	mg/Kg	2
Total Barium		1,2,3,4,6	< 0.0501	mg/Kg	1
Total Cadmium		1,2,3,4,6	< 0.0320	mg/Kg	0.5
Total Chromium		1,2,3,4,6	< 0.0512	mg/Kg	0.5

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Report Date: March 27, 2015 7250715028.001		Work Order: 15032 PRISE 1009 RELI		Page Number Edd	r: 13 of 27 y Co, NM
method blank continued					
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Total Lead		1,2,3,4,6	< 0.263	mg/Kg	1
Total Selenium	mg/Kg	2			

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 120168 Prep Batch: 101644			Date Analyz QC Prepara					Analyzed 1 Prepared 1	
			LCS			Spike	Matrix		Rec.
Dorom	F	C	Pogult	Unita	Dil	Amount	Pogult	Poo	Limit

			LOD			opine	TATOOL IV		1000.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		5	2.02	m mg/Kg	1	2.00	< 0.00533	101	70 - 130
Toluene		5	1.96	m mg/Kg	1	2.00	$<\!0.00645$	98	70 - 130
Ethylbenzene		5	1.98	m mg/Kg	1	2.00	< 0.0116	99	70 - 130
Xylene		5	5.97	m mg/Kg	1	6.00	< 0.00874	100	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.	Limit	RPD	Limit
Benzene		5	2.03	mg/Kg	1	2.00	< 0.00533	102	70 - 130	0	20
Toluene		5	1.94	$\mathrm{mg/Kg}$	1	2.00	$<\!0.00645$	97	70 - 130	1	20
Ethylbenzene		5	1.94	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	97	70 - 130	2	20
Xylene		5	5.88	$\mathrm{mg/Kg}$	1	6.00	< 0.00874	98	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.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.69	1.62	mg/Kg	1	2.00	84	81	70 - 130
4-Bromofluorobenzene (4-BFB)	2.00	1.92	m mg/Kg	1	2.00	100	96	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{120169}{101644}$			•							By: AK By: AK
					LCS			Spike	Matrix		Rec.
Param			\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO				5	21.9	m mg/Kg	1	20.0	$<\!2.32$	110	70 - 130
D (• 1	1 .1	•1	1		.1 .1	1	.1 1 1	1.		

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

Report Date: March 27, 2015 Work Order: 15032028 Page Number: 15 of 27 7250715028.001 ENTERPRISE 1009 RELIEF VALVE Eddy Co, NM control spikes continued ... LCSD Spike Matrix Rec. RPD \mathbf{F} \mathbf{C} Result Units Dil. Amount Result Limit RPD Param Rec. Limit LCSD RPD Spike Matrix Rec. Param F С Result Units Dil. Amount Result Limit RPD Limit Rec. GRO < 2.3270 - 130 23.0mg/Kg 1 20.0 115520 5 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. LCSD LCS LCS LCSD Rec. Spike Rec. Surrogate Result Result Units Dil. Amount Rec. Limit $\overline{\mathrm{mg/Kg}}$ Trifluorotoluene (TFT) 1.84 1.851 2.00 92 92 70 - 130 4-Bromofluorobenzene (4-BFB) 2.0094 70 - 130 1.891.91mg/Kg 1 96

Laboratory Control Spike (LCS-1)

QC Batch:	120172	Date Analyzed:	2015-03-23	Analyzed By:	$\mathbf{E}\mathbf{M}$
Prep Batch:	101679	QC Preparation:	2015-03-23	Prepared By:	$\mathbf{E}\mathbf{M}$

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			2320	m mg/Kg	5	2500	<19.2	93	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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2420	mg/Kg	5	2500	<19.2	97	85 - 115	4	20

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

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{120180}{101678}$		D Q	Analyzed By: SO Prepared By: SO						
				LCS			Spike	Matrix		Rec.
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO			5	292	m mg/Kg	1	250	<7.41	117	70 - 130

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

Spike bil. Amoun Spike bil. Amoun 1 250 ne spike and	Matrix at Result <7.41	Rec. Rec. 111	Rec. Limit Rec. Limit 70 - 130	RPD RPD 5	RPD Limit RPD Limit
il. Amoun Spike il. Amoun 1 250	t Result Matrix t Result <7.41	Rec.	Limit Rec. Limit 70 - 130	RPD	Limit RPD Limit
Spike vil. Amoun 1 250	Matrix at Result <7.41	Rec.	Rec. Limit 70 - 130	RPD	RPD Limit
il. Amoun 1 250	t Result <7.41	111	Limit 70 - 130		Limit
il. Amoun 1 250	t Result <7.41	111	Limit 70 - 130		Limit
				5	
ne spike and	spike duplic	ate resul			20
			lt.		
	Spike	LCS	LCS	D	Rec.
Dil.	Amount	Rec.		•	Limit
g 1	100	120	111		70 - 130
2015-03-26 2015-03-26				• •	
	Spike	Mat	trix		Rec.
nits Dil.	Spike Amount	Mat Res		lec.	Rec. Limit
	1 2015-03-26	1 100 2015-03-26	1 100 120 2015-03-26	1 100 120 111 2015-03-26 Anal:	1 100 120 111 7 2015-03-26 Analyzed By

Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Mercury		1,2,3,4,6	0.243	$\mathrm{mg/Kg}$	1	0.250	< 0.00325	97	80 - 120	2	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: 120321 Prep Batch: 101746	Date Analyzed: 2015-03-26 QC Preparation: 2015-03-25							Analyzed By: LM Prepared By: PM			
			LCS			Spike	Matrix		Rec.		
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit		
Total Silver		1,2,3,4,6	12.5	mg/Kg	1	12.5	< 0.0344	100	85 - 115		
Total Arsenic		1,2,3,4,6	50.2	m mg/Kg	1	50.0	< 0.432	100	85 - 115		
Total Barium		1,2,3,4,6	103	m mg/Kg	1	100	$<\!0.0501$	103	85 - 115		
Total Cadmium		1,2,3,4,6	25.7	m mg/Kg	1	25.0	< 0.0320	103	85 - 115		
Total Chromium		1,2,3,4,6	10.0	m mg/Kg	1	10.0	< 0.0512	100	85 - 115		
Total Lead		1,2,3,4,6	52.3	mg/Kg	1	50.0	< 0.263	105	85 - 115		

continued ...

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control spikes continued ...

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Total Selenium		$1,\!2,\!3,\!4,\!6$	50.8	m mg/Kg	1	50.0	< 0.422	102	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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Silver		1,2,3,4,6	12.5	mg/Kg	1	12.5	< 0.0344	100	85 - 115	0	20
Total Arsenic		1,2,3,4,6	50.2	$\mathrm{mg/Kg}$	1	50.0	< 0.432	100	85 - 115	0	20
Total Barium		1,2,3,4,6	104	$\mathrm{mg/Kg}$	1	100	$<\!0.0501$	104	85 - 115	1	20
Total Cadmium		1,2,3,4,6	25.7	$\mathrm{mg/Kg}$	1	25.0	< 0.0320	103	85 - 115	0	20
Total Chromium		1,2,3,4,6	10.0	$\mathrm{mg/Kg}$	1	10.0	$<\!0.0512$	100	85 - 115	0	20
Total Lead		1,2,3,4,6	53.2	$\mathrm{mg/Kg}$	1	50.0	< 0.263	106	85 - 115	2	20
Total Selenium		1,2,3,4,6	50.4	$\mathrm{mg/Kg}$	1	50.0	< 0.422	101	85 - 115	1	20

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

Matrix Spikes

Matrix Spike	(MS-1) Spiked Sample: 389081
--------------	-------	-------------------------

QC Batch:	120168	Date Analyzed:	2015-03-23	Analyzed By:	AK
Prep Batch:	101644	QC Preparation:	2015-03-20	Prepared By:	AK

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		5	1.65	mg/Kg	1	2.00	< 0.00533	82	70 - 130
Toluene		5	1.67	m mg/Kg	1	2.00	$<\!0.00645$	84	70 - 130
Ethylbenzene		5	1.77	m mg/Kg	1	2.00	< 0.0116	88	70 - 130
Xylene		5	5.42	mg/Kg	1	6.00	< 0.00874	90	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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		5	1.68	mg/Kg	1	2.00	< 0.00533	84	70 - 130	2	20
Toluene		5	1.72	$\mathrm{mg/Kg}$	1	2.00	$<\!0.00645$	86	70 - 130	3	20
Ethylbenzene		5	1.83	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	92	70 - 130	3	20
Xylene		5	5.56	mg/Kg	1	6.00	< 0.00874	93	70 - 130	3	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.65	1.55	mg/Kg	1	2	82	78	70 - 130
4-Bromofluorobenzene (4-BFB)	2.04	1.98	$\mathrm{mg/Kg}$	1	2	102	99	70 - 130

Matrix Spike (MS-1) Spiked Sample: 389081

QC Batch: Prep Batch:	$\frac{120169}{101644}$										
					MS			Spike	Matrix		Rec.
Param			\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		Qs	$_{\rm Qs}$	5	12.6	m mg/Kg	1	20.0	<2.32	63	70 - 130
-									-		

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

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matrix spikes continued			MCD			C .1	N		Л		חחח
Param	F	С	MSD Result	Unit	s Dil.	Spike Amount	Matri Resul		Rec. Limi		$\begin{array}{c} \operatorname{RPD} \\ \operatorname{Limit} \end{array}$
Param	F	С	MSD Result	Unit	s Dil.	Spike Amount	Matri Resul		Rec. Limi		RPD Limit
GRO		5	14.8	mg/ł		20.0	<2.32		70 - 13		20
Percent recovery is based on the s	spike	rest	ılt. RPD	is base	d on the	spike and s	spike dup	licate res	sult.		
-	-				MSD	-		Spike	MS	MSD	Rec.
Surrogate					Result	Units	Dil. A	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)				75	1.77	mg/Kg	1	2	88	88	70 - 130
4-Bromofluorobenzene (4-BFB)			1.	95	1.99	mg/Kg	1	2	98	100	70 - 130
				MS			Spike	Ma	trix		Rec.
Param		F	C F		Units	Dil.	-	nt Res	sult	Rec.	
		F		Result 3190	Units mg/Kg	Dil.	Amour 2500			Rec. 104 78	$\frac{\text{Limit}}{8.9 - 121}$
Chloride				Result 3190	mg/Kg	g 5	Amour 2500	58	80		Limit
Chloride			ılt. RPD	Result 3190	mg/Kg	spike and s	Amour 2500 spike dup	58 licate res	80 sult.		Limit 8.9 - 121
Chloride Percent recovery is based on the s				Result 3190	mg/Kg d on the	g 5	Amour 2500	58 licate res	80	104 78	Limit 8.9 - 121 RPD
Param Chloride Percent recovery is based on the s Param Chloride	spike F	resu	llt. RPD MSD Result 3190	Result 3190 is base Units mg/K	$\frac{\text{mg/Kg}}{\text{d on the}}$	g 5 spike and s Spike Amount 2500	Amoun 2500 spike dup Matrix Result 580	58 dicate res Rec. 104	80 sult. Rec. Limit 78.9 - 1	104 78 RPD	Limit 8.9 - 121 RPD
Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s	spike F spike	c resu	llt. RPD MSD Result 3190	Result 3190 is base Units mg/K	$\frac{\text{mg/Kg}}{\text{d on the}}$	g 5 spike and s Spike Amount 2500	Amoun 2500 spike dup Matrix Result 580	58 dicate res Rec. 104	80 sult. Rec. Limit 78.9 - 1	104 78 RPD	Limit 8.9 - 121 RPD Limit
Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Matrix Spike (MS-1) Spiked QC Batch: 120180	spike F spike	c resu	Ilt. RPD MSD Result 3190 Ilt. RPD : 389290 Dat	Result 3190 is base Units mg/K	$\frac{\text{mg/Kg}}{\text{d on the}}$	g 5 spike and s Spike Amount 2500	Amoun 2500 spike dup Matrix Result 580	58 dicate res Rec. 104	80 sult. Rec. Limit 78.9 - 1 sult.	104 78 RPD	Limit 8.9 - 121 RPD Limit 20 By: SC
Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Matrix Spike (MS-1) Spiked QC Batch: 120180	spike F spike	c resu	llt. RPD MSD Result 3190 llt. RPD : 389290 Dat QC	Result 3190 is base Units mg/K is base	$\frac{\text{mg/Kg}}{\text{d on the}}$	g 5 spike and s Spike Amount 2500 spike and s spike and s 015-03-23 015-03-23	Amoun 2500 spike dup Matrix Result 580	58 Nicate res Rec. 104 Nicate res	80 sult. Rec. Limit 78.9 - 1 sult.	104 78 5 RPD 21 0	Limit 8.9 - 121 RPD Limit 20 By: SC

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

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matrix spikes continued			MOD			a .1			D		DDD
Param	F	С	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
						a				-	
Param	F	С	MSD Result	IIn:ta	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	Г	5	269	Units mg/Kg	<u> </u>	250	<7.41	108	70 - 130	2	Limit 20
Percent recovery is based on the	snike										
referit fectively is based on the	-				n one st	JIKC and Sp	-				
a		AS .	MSI		•.	D.11	Spike	MS			Rec.
Surrogate	Re	sult	Resu	ilt U	nits	Dil.	Amount	Re			Limit
		11	106	i me	r/Kø	1	100	11	1 10	6	70 - 130
n-Tricosane		11	106	i mg	g/Kg	1	100	11	1 10	6	70 - 130
n-Tricosane Matrix Spike (MS-1) Spike	1		: 389290				100	11			
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304	1		: 389290 Date	Analyzed	l: 201	.5-03-26	100	11	Anal	lyzed B	y: TP
n-Tricosane Matrix Spike (MS-1) Spike	1		: 389290 Date		l: 201		100	11	Anal		y: TP
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304	1		: 389290 Date	- Analyzec Preparatic	l: 201	.5-03-26			Anal Prep	lyzed B	y: TP y: TP
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304	1	mple	: 389290 Date QC I	Analyzed	l: 201 on: 201	.5-03-26	Spike	Ma	Anal Prep atrix	lyzed B pared B	y: TP
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304 Prep Batch: 101783	1 ed Sai	mple	: 389290 Date QC I	Analyzec Preparatic MS	l: 201	.5-03-26 .5-03-26 Dil.		Ma Re	Anal Prep utrix sult H	lyzed B pared B	y: TP y: TP Rec.
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304 Prep Batch: 101783 Param	1 ed Sar H	mple	: 389290 Date QC I <u>C</u>	Analyzec Preparatic MS Result 0.248	l: 201 on: 201 Units mg/Kg	.5-03-26 .5-03-26 Dil. g 1	Spike Amount 0.250	Ма Re <0.0	Anal Prep utrix sult F 00325	lyzed B pared B	y: TP y: TP Rec. Limit
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304 Prep Batch: 101783 Param Total Mercury	1 ed Sar H	mple	: 389290 Date QC I C 1,2,3,4,6 It. RPD	Analyzec Preparatic MS Result 0.248 is based o	l: 201 on: 201 Units mg/Kg	.5-03-26 .5-03-26 <u>Dil.</u> <u>g 1</u> pike and sp	Spike Amount 0.250 bike duplic	Ма Re <0.0	Anal Prep utrix <u>sult F</u> 00325 lt.	lyzed B pared B	y: TP y: TP Rec. Limit 80 - 120
n-Tricosane Matrix Spike (MS-1) Spike QC Batch: 120304 Prep Batch: 101783 Param Total Mercury	1 ed Sar H	mple	: 389290 Date QC I <u>C</u>	Analyzec Preparatic MS Result 0.248 is based o	l: 201 on: 201 Units mg/Kg	.5-03-26 .5-03-26 Dil. g 1	Spike Amount 0.250	Ма Re <0.0	Anal Prep utrix sult F 00325	lyzed B pared B	y: TP y: TP Rec. Limit

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

Matrix Spike (MS-1) Spiked Sample: 389290

QC Batch:	120321	Date Analyzed:	2015-03-26	Analyzed By:	LM
Prep Batch:	101746	QC Preparation:	2015-03-25	Prepared By:	\mathbf{PM}

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
Total Silver		1,2,3,4,6	11.1	$\mathrm{mg/Kg}$	1	12.5	< 0.0344	89	75 - 125
Total Arsenic		1,2,3,4,6	45.5	m mg/Kg	1	50.0	< 0.432	91	75 - 125
Total Barium		1,2,3,4,6	161	m mg/Kg	1	100	64.35	97	75 - 125
Total Cadmium		1,2,3,4,6	23.8	$\mathrm{mg/Kg}$	1	25.0	< 0.0320	95	75 - 125
Total Chromium		1,2,3,4,6	13.6	mg/Kg	1	10.0	4.423	92	75 - 125
Total Lead		1,2,3,4,6	48.9	mg/Kg	1	50.0	< 0.263	98	75 - 125

 $continued \dots$

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matrix spikes continued ...

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Total Selenium		1,2,3,4,6	48.4	m mg/Kg	1	50.0	< 0.422	97	75 - 125

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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Silver		1,2,3,4,6	11.3	mg/Kg	1	12.5	< 0.0344	90	75 - 125	2	20
Total Arsenic		1,2,3,4,6	46.6	$\mathrm{mg/Kg}$	1	50.0	< 0.432	93	75 - 125	2	20
Total Barium		1,2,3,4,6	159	$\mathrm{mg/Kg}$	1	100	64.35	95	75 - 125	1	20
Total Cadmium		1,2,3,4,6	24.0	mg/Kg	1	25.0	< 0.0320	96	75 - 125	1	20
Total Chromium		1,2,3,4,6	13.8	$\mathrm{mg/Kg}$	1	10.0	4.423	94	75 - 125	1	20
Total Lead		1,2,3,4,6	48.8	$\mathrm{mg/Kg}$	1	50.0	< 0.263	98	75 - 125	0	20
Total Selenium		1,2,3,4,6	46.6	$\mathrm{mg/Kg}$	1	50.0	< 0.422	93	75 - 125	4	20

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

Calibration Standards

Standard (CCV-2)

QC Batch: 120168		Date An			15-03-23		Analyzed By: AK		
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Benzene		5	mg/kg	0.100	0.0985	98	80 - 120	2015-03-23	
Toluene		5	m mg/kg	0.100	0.0963	96	80 - 120	2015-03-23	
Ethylbenzene		5	m mg/kg	0.100	0.0957	96	80 - 120	2015-03-23	
Xylene		5	mg/kg	0.300	0.287	96	80 - 120	2015-03-23	

Standard (CCV-3)

QC Batch: 120168			Date An	alyzed: 20	15-03-23		Analyzed By: AK		
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Benzene		5	mg/kg	0.100	0.102	102	80 - 120	2015-03-23	
Toluene		5	m mg/kg	0.100	0.0988	99	80 - 120	2015-03-23	
Ethylbenzene		5	m mg/kg	0.100	0.0961	96	80 - 120	2015-03-23	
Xylene		5	mg/kg	0.300	0.297	99	80 - 120	2015-03-23	

Standard (CCV-2)

QC Batch:	120169		Date	Analyzed:	2015-03-23		Analy	zed By: AK
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		5	m mg/Kg	1.00	1.07	107	80 - 120	2015-03-23

Standard (CCV-3)

QC Batch: 120169

Date Analyzed: 2015-03-23

Analyzed By: AK

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		5	mg/Kg	1.00	1.11	111	80 - 120	2015-03-23
Standard (I	CV-1)							
QC Batch: 1	.20172		Date 1	Analyzed:	2015-03-23		Analy	zed By: EM
Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride	Plag	Cert	mg/Kg	100	100	100	85 - 115	2015-03-23
/ _								
Standard (C QC Batch: 1	,		Date .	Analyzed:	2015-03-23		Analy	zed By: EM
· · · · · · · · · · · · · · · · · · ·	,		Date 2	CCVs	$\rm CCVs$	CCVs	Percent	,
QC Batch: 1	.20172	Cont		CCVs True	CCVs Found	Percent	Percent Recovery	Date
	,	Cert	Units	CCVs	$\rm CCVs$		Percent	,
QC Batch: 1 Param	.20172	Cert		CCVs True Conc.	CCVs Found Conc.	Percent Recovery	Percent Recovery Limits	Date Analyzed
QC Batch: 1 Param	.20172 Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	Percent Recovery	Percent Recovery Limits	Date Analyzed
QC Batch: 1 Param Chloride	.20172 Flag	Cert	Units mg/Kg	CCVs True Conc.	CCVs Found Conc.	Percent Recovery	Percent Recovery Limits 85 - 115	Date Analyzed
QC Batch: 1 Param Chloride Standard (C	.20172 Flag	Cert	Units mg/Kg	CCVs True Conc. 100 Analyzed: CCVs	CCVs Found Conc. 100 2015-03-23 CCVs	Percent Recovery 100 CCVs	Percent Recovery Limits 85 - 115 Analy Percent	Date Analyzed 2015-03-23 vzed By: SC
QC Batch: 1 Param Chloride Standard (C QC Batch: 1	.20172 Flag CCV-1) .20180		Units mg/Kg Date	CCVs True Conc. 100 Analyzed: CCVs True	CCVs Found Conc. 100 2015-03-23 CCVs Found	Percent Recovery 100 CCVs Percent	Percent Recovery Limits 85 - 115 Analy Percent Recovery	Date Analyzed 2015-03-23 vzed By: SC Date
QC Batch: 1 Param Chloride Standard (C	.20172 Flag	Cert Cert	Units mg/Kg	CCVs True Conc. 100 Analyzed: CCVs	CCVs Found Conc. 100 2015-03-23 CCVs	Percent Recovery 100 CCVs	Percent Recovery Limits 85 - 115 Analy Percent	Date Analyzed 2015-03-23 vzed By: SC

Standard (CCV-2)

QC Batch: 120180

Date Analyzed: 2015-03-23

Analyzed By: SC

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Param F	ʻlag Ce	ert U	Jnits	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed		
DRO	Ę	5 m	g/Kg	250	272	109	80 - 120	2015-03-23		
Standard (CCV-1)										
QC Batch: 120304			Date A	nalyzed: 20	015-03-26		Analy	zed By: TP		
-		<i>a</i>		CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date		
Param Total Mercury	Flag	Cert 1,2,3,4,6	Units mg/L	Conc. 0.0100	Conc. 0.0100	Recovery 100	Limits 90 - 110	Analyzed 2015-03-26		
QC Batch: 120304			Date An	nalyzed: 20 CCVs True	015-03-26 CCVs Found	CCVs Percent	Analy Percent Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Total Mercury Standard (ICV-1) QC Batch: 120321		1,2,3,4,6	mg/L Date Ar	0.0100	0.00985	98	90 - 110 Analy	2015-03-26 zed By: LM		
QC Datcii: 120321			Date Al	·				zed Dy: LM		
				ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date		
Param	Flag	Cert	Units			Recovery	Limits	Analyzed		
Total Silver	0	1,2,3,4,6	mg/Kg			102	90 - 110	2015-03-26		
Total Arsenic		1,2,3,4,6	mg/Kg		0.996	100	90 - 110	2015-03-26		
Total Barium		1,2,3,4,6	mg/Kg	-	1.03	103	90 - 110	2015-03-26		
Total Cadmium		1,2,3,4,6	mg/Kg		1.03	103	90 - 110	2015-03-26		
Total Chromium			$m\sigma/K$	m 1.00	1.00	100	00 110	2015 03 26		

mg/Kg

mg/Kg

mg/Kg

1,2,3,4,6

1,2,3,4,6

1,2,3,4,6

1.00

1.00

1.00

1.00

1.09

1.07

100

109

107

90 - 110

90 - 110 90 - 110 2015-03-26

2015-03-26

2015-03-26

Total Chromium

Total Selenium

Total Lead

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Standard (CCV-1)

QC Batch: 120321			Date Analy	zed: 2015	-03-26		Analyz	zed By: LM
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Total Silver		1,2,3,4,6	mg/Kg	0.125	0.124	99	90 - 110	2015-03-26
Total Arsenic		1,2,3,4,6	mg/Kg	1.00	1.01	101	90 - 110	2015-03-26
Total Barium		1,2,3,4,6	mg/Kg	1.00	0.906	91	90 - 110	2015-03-26
Total Cadmium		1,2,3,4,6	mg/Kg	1.00	1.00	100	90 - 110	2015-03-26
Total Chromium		1,2,3,4,6	mg/Kg	1.00	1.00	100	90 - 110	2015-03-26
Total Lead		1,2,3,4,6	mg/Kg	1.00	1.08	108	90 - 110	2015-03-26
Total Selenium		1,2,3,4,6	mg/Kg	1.00	1.03	103	90 - 110	2015-03-26

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Appendix

Report Definitions

Name	Definition
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	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2014-018	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.

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F Description

Qsr Surrogate recovery outside of laboratory limits.

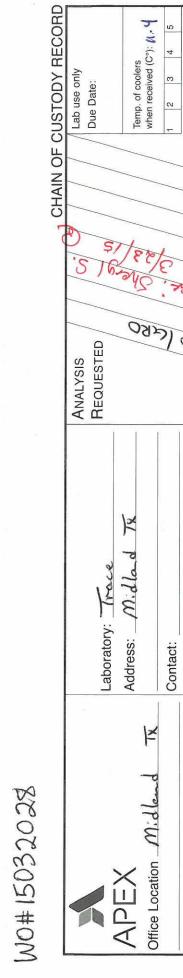
U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page. CHAIN OF CUSTODY RECORD Temp. of coolers when received (C°): M.- Y Lab Sample ID (Lab Use Only) #Zy the Quist 4 of. Lab use only Due Date: ო Page___ N 389292 389290 Freusur tren lio - o SL - sludge NOTES: (KO AN A P60 ANALYSIS REQUESTED W 5108 \succ C - Charcoal tube P/O - Plastic or other _ Hai Vadic+1215 Time: Date: Time: Time: × Z 80318 REK 877 Y Date: Date: X (2) (2) No/Type of Containers L - Liquid A - Air Bag 250 ml - Glass wide mouth 11 F 9/9 ズ 3 Received by: (Signature) Received by: (Signature) Received by: (Signature) Received by: (Signature) AOV Start Depth End Mepth Address: Midla d -377 مبر ' MT00% Rush 33 Laboratory: Trace ۵ 0 JON 11 0 0 Nolt P ampler's Signature W - Water S - Soil SD - Solid A/G - Amber / Or Glass 1 Liter Identifying Marks of Sample(s) Project Manager Kernelowne Toby PO/SO#: 🗆 50% Rush Contact: Phone: Project Name Enter Projection Felier 1 Time: Time: 1670 1670 Time: C5-3 25-1 C5-3 Date: Sheris □ 25% Rush Date: 下 Date: Date: 1000 × ൨ഺഄഺ Office Location Midlend)oEa Norma WW - Wastewater VOA - 40 ml vial 13210 Relinquished by (Signature) Relinquished by (Signature) Relinquished by (Signature) 13:00 131.05 Relinguished by (Signature) 1220715028.001 Time Kimer 3 Jac Turn around time APEX Date Joi S Sampler's Name troves Matrix Container Proj. No. Matrix 3

W0#15032028

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	C - Charcoal tube SL - sludge O - Oil P/O - Plastic or other	L - Liquid A - Air Bag 250 ml - Glass wide mouth	W - Water S - Soil SD - Solid A/G - Amber / Or Glass 1 Liter	Matrix WW - Wastewater Container VOA - 40 ml vial
	BmC	l by: (Signature)	Date: Time:	hed t
of 24 He Cushe	Time:	Received by: (Signature) Date:		Relinquíshéd bý (Signature)
Tern Added the Tot. 8 m	i	Date:	5+ 1670 N	Belinquished by (Signature)
3/23/15- Sunt a Multon.	IZIS Star	Received dy: (Stgpature) Date:		Relinquished by (Signature)
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Lab Sample ID (Lab Use Only)	BE CAL	Start the frage fr	D r ldentifying Marks of Sample(s)	Time
		OULVE NIN 3 Calcuss	ec ec	Proj. No. Pr. 7350715028.001
	197. 15 M 15 M	Sampler's Signature	Sampler	Sampler's Name
	_)#:	loone Toby PO/SO#:	Project Manager Kerchenne
Page of of	60		Phone:	
1 2 3 4 5	10 m	ŧ	Contact:	
Temp. of coolers when received (C°): M 4	SV SV	n-010/	TX Prove	Office Location Midl
	6-0	$\neg \succ$	Address:	APFX
Due Date:	REQUESTED /	aboratory:	Labora	
Lab use only	ANALYSIS / / Co./ Co			

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200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703 Carroliton. Texas 75006 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432.689.6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Karolanne Toby APEX/Titan 2351 W. Northwest Hwy. Suite 3321 Dallas, Tx, 75220

Report Date: May 13, 2015

Work Order:	15050632

1009 Relief Valve Release **Project** Name: Project Number: 7250715028

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
392611	CS-1	soil	2015-05-06	13:00	2015-05-06
392612	CS-2	soil	2015-05-06	13:05	2015-05-06
392613	CS-3	soil	2015-05-06	13:10	2015-05-06
392614	CS-4	soil	2015-05-06	13:15	2015-05-06
392615	CS-5	soil	2015-05-06	13:20	2015-05-06
392616	CS-6	soil	2015-05-06	13:25	2015-05-06
392617	CS-7	soil	2015-05-06	13:30	2015-05-06
392618	CS-8	soil	2015-05-06	13:35	2015-05-06
392619	CS-9	soil	2015-05-06	13:40	2015-05-06
392620	CS-10	soil	2015-05-06	13:45	2015-05-06
392621	CS-11	soil	2015-05-06	13:50	2015-05-06
392622	CS-12	soil	2015-05-06	13:55	2015-05-06
392623	CS-13	soil	2015-05-06	14:00	2015-05-06
392624	CS-14	soil	2015-05-06	14:05	2015-05-06
392625	CS-15	soil	2015-05-06	14:10	2015-05-06
392626	CS-16	soil	2015-05-06	14:15	2015-05-06
392627	CS-17	soil	2015-05-06	12:30	2015-05-06
392628	CS-18	soil	2015-05-06	12:35	2015-05-06

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392629	CS-19	soil	2015-05-06	12:40	2015-05-06
392630	CS-20	soil	2015-05-06	12:45	2015-05-06
392631	CS-21	soil	2015-05-06	12:50	2015-05-06
392632	CS-22	soil	2015-05-06	12:55	2015-05-06

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.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 60 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lefturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Case Narrative

Samples for project 1009 Relief Valve Release were received by TraceAnalysis, Inc. on 2015-05-06 and assigned to work order 15050632. Samples for work order 15050632 were received intact at a temperature of 5.7 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	102658	2015-05-07 at 08:17	121360	2015-05-08 at 07:31
BTEX	S 8021B	102695	2015-05-08 at $10:01$	121396	2015-05-11 at $07:43$
Chloride (Titration)	SM 4500-Cl B $$	102667	2015-05-07 at $11:44$	121337	2015-05-07 at $11:45$
Chloride (Titration)	SM 4500-Cl B $$	102671	2015-05-07 at $11:53$	121342	2015-05-07 at $11:54$
Chloride (Titration)	SM 4500-Cl B $$	102692	2015-05-08 at $08:51$	121366	2015-05-08 at $08:52$
TPH DRO - NEW	S 8015 D	102683	2015-05-07 at $10:30$	121364	2015-05-08 at $08:45$
TPH DRO - NEW	S 8015 D	102684	2015-05-07 at $14:54$	121397	2015-05-11 at $08:04$
TPH GRO	S 8015 D	102658	2015-05-07 at $08:17$	121361	2015-05-08 at $07:37$
TPH GRO	S 8015 D	102727	2015-05-11 at 11:22	121435	2015-05-12 at $10:39$

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 15050632 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.

Dilution

1

Units

mg/Kg

 RL

50.0

Analytical Report

Sample: 392611 - CS-1

Parameter

DRO

Laboratory: Analysis: QC Batch: Prep Batch:	Midland BTEX 121360 102658		Analytical Date Ana Sample Pr	lyzed:	S 8021 2015-0 : 2015-0	5-08		Prep Method Analyzed By Prepared By:	AK	5
					RL					
Parameter	F	\log	Cert		Result	Units		Dilution	RI	_
Benzene		U	1	<	0.0200	mg/Kg		1	0.0200	
Toluene		U	1		(0.0200)	mg/Kg		1	0.0200	
Ethylbenzene	;	U	1	<	(0.0200)	$\mathrm{mg/Kg}$		1	0.0200	G
Xylene		U	1	<	(0.0200)	mg/Kg		1	0.0200	C
Surrogate Trifluorotolue		Flag	Cert	Result 2.16	Units mg/Kg	Dilution 1	Spike Amount 2.00	Percent Recovery 108	Recovery Limits 70 - 130	
	obenzene (4-BFB)			$2.10 \\ 2.20$	mg/Kg	1	2.00 2.00	108	70 - 130 70 - 130	
Sample: 392 Laboratory: Analysis: QC Batch: Prep Batch:	2611 - CS-1 Midland Chloride (Titration) 121337 102667		Date	ytical Met Analyzed ple Prepar	: 20	M 4500-Cl B 015-05-07 015-05-07		Prep Methe Analyzed E Prepared B	y: ÉM	
Parameter	Fl	ag	Cert]	Result	Units	5	Dilution	RI	
Chloride	τ				$<\!20.0$	mg/Kg	5	5	4.00	0
Sample: 392 Laboratory: Analysis: QC Batch: Prep Batch:	2611 - CS-1 Midland TPH DRO - NEW 121364 102683		Dat	alytical Me e Analyze aple Prepa	d: 2	S 8015 D 2015-05-08 2015-05-07		Prep Metho Analyzed E Prepared B	y: SC	ł

Result

 $<\!50.0$

 Cert

1

Flag

Report Date: May 13, 201 7250715028	5	Work Order: 15050632 1009 Relief Valve Release							Page Number: 7 of 60	
Surrogate Fl	ag Cei	rt I	Result	Units	Dilut		Spike mount	Percent Recovery	Recovery Limits	
n-Tricosane			93.5	m mg/Kg	1		100	94	70 - 130	
Sample: 392611 - CS-1										
Laboratory:MidlandAnalysis:TPH GROQC Batch:121361Prep Batch:102658			Date An	al Method: alyzed: Preparation:	S 8015 2015-0 2015-0	5-08		Prep Metho Analyzed B Prepared B	y: AK	
					RL					
Parameter	Flag		Cert	Re	esult	Un	its	Dilution	RL	
GRO	$_{\mathrm{Qs},\mathrm{U}}$		1	<	4.00	mg/	Kg	1	4.00	
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotoluene (TFT)		Tag	0010		mg/Kg	1	2.00	85	$\frac{1111105}{70 - 130}$	
4-Bromofluorobenzene (4-I	BFB)				mg/Kg	1	2.00	98	70 - 130	

Sample: 392612 - CS-2

Laboratory: Mid Analysis: BTF QC Batch: 1213 Prep Batch: 1026	EX 860		Date Ana	l Method: lyzed: reparation	2015-05	-08		Prep Method Analyzed By Prepared By	: AK
					RL				
Parameter		Flag	Cert		Result	Uni	ts	Dilution	RL
Benzene	1	U	1	<	< 0.0400	mg/K	g	2	0.0200
Toluene		U	1	<	< 0.0400	mg/K	g	2	0.0200
Ethylbenzene		U	1	<	< 0.0400	mg/K	g	2	0.0200
Xylene		U	1	<	< 0.0400	mg/K	g	2	0.0200
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (7	TFT)			4.29	mg/Kg	2	4.00	107	70 - 130
4-Bromofluorobenz	zene (4-BFB)			4.30	$\mathrm{mg/Kg}$	2	4.00	108	70 - 130

Report Date 7250715028	:: May 13, 2015				Vork Orde 09 Relief V					Page Number: 8 of 60		
Sample: 39	2612 - CS-2											
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titratio 121337 102667	n)		Date	ytical Met Analyzed ple Prepar	l:	SM 450 2015-05 2015-05	5-07	}	Prep Meth Analyzed I Prepared I	By: EM	
						RL						
Parameter		Flag		Cert]	Result		Un		Dilution	RL	
Chloride		U				<20.0		mg/l	хg	5	4.00	
Sample: 39 Laboratory: Analysis: QC Batch: Prep Batch:	2612 - CS-2 Midland TPH DRO - NEW 121364 102683	7		Dat	lytical Me e Analyze 1ple Prepa	d:	S 8015 2015-0 2015-0	5-08		Prep Meth Analyzed 1 Prepared I	By: SC	
Parameter		Flag		Cert]	RL Result		Un	its	Dilution	RL	
DRO		0		1		<50.0		mg/l	Kg	1	50.0	
Surrogate	Flag	Cert]	Result	Units		Dilution		Spike mount	Percent Recovery	Recovery Limits	
n-Tricosane				97.7	mg/Kg		1		100	98	70 - 130	
Sample: 39 Laboratory: Analysis: QC Batch: Prep Batch:	2612 - CS-2 Midland TPH GRO 121361 102658			Date An	al Method alyzed: Preparatio	201	3015 D 15-05-08 15-05-07			Prep Methoo Analyzed By Prepared By	v: AK	
Parameter		Flag		Cert		RL Result			its	Dilution	RL	
GRO	2	Qs,U		1		$<\!\!8.00$		mg/	Kg	2	4.00	
Surrogate	(mpm)		Flag	Cert	Result	Unit		lution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotolue	ene (TFT) cobenzene (4-BFB)				3.48	mg/k		2	4.00	87 07	70 - 130 70 - 130	
+-Dromonuor	obelizelle (4-BFB)				3.88	mg/k	rg	2	4.00	97	10 - 130	

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7250715028	1009 Relief Valve Release	

Sample: 392613 - CS-3

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Date Ana	l Method: lyzed: reparation:	S 8021E 2015-05 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	3	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg	5	1	0.0200
Ethylbenzene	U	1	<	0.0200	m mg/Kg	5	1	0.0200
Xylene	U	1	<	0.0200	m mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.25	mg/Kg	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)			2.31	$\mathrm{mg/Kg}$	1	2.00	116	70 - 130

Sample: 392613 - CS-3

Laboratory: Analysis: QC Batch: Prep Batch:	Chloride (Titration) 121337		ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392613 - CS-3

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEW 121364 102683		Date	lytical Metho e Analyzed: ple Preparat	2015-0	05-08	Prep Me Analyzec Preparec	v
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	<5	0.0	m mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			97.4	m mg/Kg	1	100	97	70 - 130

Report Date: May 13, 2015 7250715028		Work Order: 15050632 1009 Relief Valve Release				Page Number: 10 of 60		
Sample: 392613 - CS-3								
Laboratory: Midland Analysis: TPH GRO QC Batch: 121361 Prep Batch: 102658		Analytical M Date Analyz Sample Prep	ed: 2015-05	5-08	Prep Metho Analyzed B Prepared B	y: AK		
			RL					
Parameter	Flag	Cert	Result	Units	Dilution	RL		
GRO	$_{\rm Qs,U}$	1	<4.00	m mg/Kg	1	4.00		
			1	Spil	e Percent	Recovery		

Surrogate Flag Cert Result Units Dilution Amount Recovery Limits Trifluorotoluene (TFT) mg/Kg 2.00 70 - 130 1.761 88 2.004-Bromofluorobenzene (4-BFB) 2.04 mg/Kg 1 10270 - 130

Sample: 392614 - CS-4

Laboratory: Midland								
Analysis: BTEX		Analytica	l Method:	S 8021E	8		Prep Method	: S 5035
QC Batch: 121360		Date Ana	lyzed:	2015-05	-08		Analyzed By:	AK
Prep Batch: 102658		Sample P	reparation:	2015-05	-07		Prepared By:	AK
				RL				
Parameter	Flag	Cert]	Result	Units	3	Dilution	RL
Benzene	U	1	<(0.0200	mg/Kg	5	1	0.0200
Toluene	U	1	<(0.0200	$\mathrm{mg/Kg}$	r S	1	0.0200
Ethylbenzene	U	1	<(0.0200	$\mathrm{mg/Kg}$	g	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.16	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			2.23	$\mathrm{mg/Kg}$	1	2.00	112	70 - 130

Sample: 392614 - CS-4

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	121337	Date Analyzed:	2015-05-07	Analyzed By:	EM
Prep Batch:	102667	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$

 $continued \dots$

Report Date: 7250715028	: May 13, 2015			ork Order: 1) Relief Valv			Page Num	ber: 11 of 60
sample 39261	4 continued \ldots							
Parameter		Flag	Cert	Res	RL sult	Units	Dilution	RL
Parameter Chloride		Flag	Cert	Res	RL sult	Units	Dilution	RL
Chloride				t	500	mg/Kg	5	4.00
Sample: 392 Laboratory: Analysis: QC Batch: Prep Batch:	2614 - CS-4 Midland TPH DRO - NE 121364 102683	W	Date	ytical Meth Analyzed: ple Preparat	2015-0)5-08	Prep Me Analyze Preparec	d By: SC
Parameter		Flag	Cert	Res	RL sult	Units	Dilution	RL
DRO			1	<5	0.0	m mg/Kg	1	50.0
Surrogate n-Tricosane	Flag	Cert	Result 84.3	Units mg/Kg	Dilution 1	Spike Amount 100	Percent Recovery 84	Recovery Limits 70 - 130
Sample: 392	2614 - CS-4							
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121361 102658		Date Ana	l Method: lyzed: reparation:	S 8015 D 2015-05-08 2015-05-07		Prep Meth Analyzed 1 Prepared 1	By: AK
					RL	Units	Dilution	

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1	2.00	100	70 - 130

Report Date: May 13, 2015	Work Order: 15050632	Page Number: 12 of 60
7250715028	1009 Relief Valve Release	

Sample: 392615 - CS-5

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Analytical Date Anal Sample Pr	lyzed:	2015-05	-08		Prep Method Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Unit	S	Dilution	RL
Benzene ³	U	1		< 0.0400	mg/K		2	0.0200
Toluene	U	1		< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
Ethylbenzene	U	1		< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
Xylene	U	1		< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			4.31	mg/Kg	2	4.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			4.38	mg/Kg	2	4.00	110	70 - 130

Sample: 392615 - CS-5

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121337 102667	Date	ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392615 - CS-5

Laboratory: Analysis: QC Batch: Prep Batch:	TPH DRO - NEW 121364		Date	lytical Metho e Analyzed: ple Preparat	2015-0	05-08	Prep Me Analyzec Preparec	l By: SC
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	<5	0.0	m mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			91.2	m mg/Kg	1	100	91	70 - 130

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Sample: 392615 - CS-5									
Laboratory:MidlandAnalysis:TPH GROQC Batch:121361Prep Batch:102658		Date An	al Methoo alyzed: Preparatio	2015-0	5-08		Prep Metho Analyzed B Prepared B	y: AK	
				RL					
Parameter	Flag	Cert		Result	Uni	ts	Dilution	RL	
GRO ⁴	$_{\rm Qs,U}$	1		<8.00	mg/k	g	2	4.00	
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotoluene (TFT)	0		3.52	mg/Kg	2	4.00	88	70 - 130	
4-Bromofluorobenzene (4-BFB)			3.96	mg/Kg	2	4.00	99	70 - 130	

Sample: 392616 - CS-6

Laboratory: Midland								
Analysis: BTEX		Analytica	al Method:	S 8021H	3		Prep Method	l: S 5035
QC Batch: 121360		Date Ana	lyzed:	2015-05	-08		Analyzed By	: AK
Prep Batch: 102658		Sample P	reparation	: 2015-05	-07		Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	1	<	0.0200	mg/K	g	1	0.0200
Toluene	U	1	<	0.0200	mg/K	g	1	0.0200
Ethylbenzene	U	1	<	0.0200	$\mathrm{mg/K}$	g	1	0.0200
Xylene	U	1	<	0.0200	mg/K	g	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.14	mg/Kg	1	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)			2.24	$\mathrm{mg/Kg}$	1	2.00	112	70 - 130

Sample: 392616 - CS-6

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	121337	Date Analyzed:	2015-05-07	Analyzed By:	$\mathbf{E}\mathbf{M}$
Prep Batch:	102667	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$

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sample 3926.	16 continued							
					RL			
Parameter		Flag	Cert	Re	sult	Units	Dilution	RL
					RL			
Parameter		Flag	Cert		sult	Units	Dilution	RL
Chloride		U		<	20.0	mg/Kg	5	4.00
Sample: 39	2616 - CS-6							
Laboratory: Analysis: QC Batch:	Midland TPH DRO - NE 121364	EW		alytical Meth e Analyzed:	nod: S 801 2015-		Prep Me Analyzeo	,
Prep Batch:	121304 102683			ple Prepara			Prepared	v
					RL			
Parameter		Flag	Cert		sult	Units	Dilution	RL
DRO			1	<	50.0	mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Tag	CCIU	95.7	mg/Kg	1	100	96	70 - 130
Sample: 39	2616 - CS-6							
Laboratory: Analysis:	Midland TPH GRO			al Method:	S 8015 D		Prep Meth	
QC Batch: Prep Batch:	$\frac{121361}{102658}$		Date An Sample I	alyzed: Preparation:	2015-05-08 2015-05-07		Analyzed I Prepared I	
					RL			

Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		Tiag	Cert	1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)				1.99	mg/Kg	1	2.00	100	70 - 130

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Sample: 392617 - CS-7

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Date Ana	l Method: lyzed: reparation:	S 8021E 2015-05 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	3	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	mg/Kg	5	1	0.0200
Ethylbenzene	U	1	<	0.0200	$\mathrm{mg/Kg}$	5	1	0.0200
Xylene	U	1	<	0.0200	$\mathrm{mg/Kg}$	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.17	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			2.19	$\mathrm{mg/Kg}$	1	2.00	110	70 - 130

Sample: 392617 - CS-7

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121337 102667	Date	ytical Method: Analyzed: ple Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	,
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	m mg/Kg	5	4.00

Sample: 392617 - CS-7

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - N 121364 102683	EW	Date	lytical Metho e Analyzed: ple Preparat	2015-0	05-08	Prep Me Analyzec Preparec	v
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	<5	0.0	mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	m mg/Kg	1	100	110	70 - 130

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Sample: 392617 - CS-7						
Laboratory: Midland Analysis: TPH GRO		Analytical N		-	Prep Method:	
QC Batch: 121361		Date Analyz	ed: $2015-05$	5-08	Analyzed By:	AK
Prep Batch: 102658		Sample Prep	paration: 2015-05	5-07	Prepared By:	AK
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
GRO	Qs,U	1	<4.00	m mg/Kg	1	4.00

	- (-, -	-			0/	-0	-	
Surrogate	Fla	ag Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Surrogate	I la	ig Cert	nesun	Omus	Dilution	Amount	necovery	Linus
Trifluorotoluene (TFT)			1.72	m mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.96	m mg/Kg	1	2.00	98	70 - 130

Sample: 392618 - CS-8

Laboratory: Midland								
Analysis: BTEX		Analytica	l Method:	S 8021E	3		Prep Method	l: S 5035
QC Batch: 121360		Date Ana	lyzed:	2015-05	-08		Analyzed By	: AK
Prep Batch: 102658		Sample P	reparation:	2015-05	-07		Prepared By	: AK
				RL				
Parameter	Flag	Cert]	Result	Unit	s	Dilution	RL
Benzene	U	1	<	0.0200	mg/K	g	1	0.0200
Toluene	U	1	<	0.0200	$\mathrm{mg/K}$	g	1	0.0200
Ethylbenzene	U	1	<	0.0200	$\mathrm{mg/K}$	g	1	0.0200
Xylene	U	1	<	0.0200	mg/K	g	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.07	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)			2.09	mg/Kg	1	2.00	104	70 - 130

Sample: 392618 - CS-8

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	121337	Date Analyzed:	2015-05-07	Analyzed By:	EM
Prep Batch:	102667	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$
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sample 3926.	18 continued							
					RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
_			~		RL			
Parameter Chloride		Flag	Cert	Res ⁻		Units	Dilution	RL 4.00
Chioride		U		<21).0	mg/Kg	5	4.00
Sample: 39	2618 - CS-8							
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 121364 102683	ZW	Dat	lytical Metho e Analyzed: pple Preparat	2015-0	05-08	Prep Me Analyzed Prepared	d By: SC
.1							1	<i>j</i>
D			C I		RL	TT •,		DI
Parameter DRO		Flag	Cert	Res	03	Units mg/Kg	Dilution 1	RI 50.0
			1	1	00	iiig/ iig	1	50.0
~		~				Spike	Percent	Recovery
Surrogate n-Tricosane	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n- fricosane			96.7	m mg/Kg	1	100	97	70 - 130
Sample: 39	2618 - CS-8							
Laboratory:	Midland							
Analysis:	TPH GRO			al Method:	S 8015 D		Prep Meth	
QC Batch: Prep Batch:	$\frac{121361}{102658}$		Date An Sample I	alyzed: Preparation:	2015-05-08 2015-05-07		Analyzed I Prepared I	
_			~		RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RI

Parameter	Flag		Cert		Result	Unit	S	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate]	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.64	mg/Kg	1	2.00	82	70 - 130
4-Bromofluorobenzene (4-BFB)				1.87	mg/Kg	1	2.00	94	70 - 130

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Sample: 392619 - CS-9

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Date Ana	l Method: lyzed: reparation:	S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	$\mathrm{mg/Kg}$	r 5	1	0.0200
Ethylbenzene	U	1	<	0.0200	$\mathrm{mg/Kg}$	r S	1	0.0200
Xylene	U	1	<	0.0200	$\mathrm{mg/Kg}$	r 5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.23	mg/Kg	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)			2.22	$\mathrm{mg/Kg}$	1	2.00	111	70 - 130

Sample: 392619 - CS-9

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121342 102671	Date	vtical Method: Analyzed: le Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392619 - CS-9

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - 1 121364 102683	NEW	Date	lytical Metho e Analyzed: ple Preparat	2015-0	05-08	Prep Me Analyzed Prepared	v
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	1	33	mg/Kg	1	50.0
Surrogate	Flag	g Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			102	mg/Kg	1	100	102	70 - 130

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Sample: 392619 - CS-9									
Laboratory:MidlandAnalysis:TPH GROQC Batch:121361Prep Batch:102658			Date An	al Methoo alyzed: Preparatio	2015-0)5-08		Prep Metho Analyzed B Prepared B	y: AK
					RL				
Parameter	Flag		Cert		Result	Unit	s	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)				1.75	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-BFB)				1.96	$\mathrm{mg/Kg}$	1	2.00	98	70 - 130

Sample: 392620 - CS-10

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Analytica Date Ana Sample Pr		S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Uni	$^{\mathrm{ts}}$	Dilution	RL
Benzene ⁵	U	1	<	< 0.0400	mg/k	ζg	2	0.0200
Toluene	U	1	<	< 0.0400	mg/k	ξg	2	0.0200
Ethylbenzene	U	1	<	< 0.0400	mg/k	Σg	2	0.0200
Xylene	U	1	<	< 0.0400	mg/k	Σg	2	0.0200
Surrogate	Flag	c Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		,	4.37	mg/Kg	2	4.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			4.18	mg/Kg	2	4.00	104	70 - 130

Sample: 392620 - CS-10

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	121342	Date Analyzed:	2015-05-07	Analyzed By:	EM
Prep Batch:	102671	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$

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sample 3926	20 continued									
Parameter		Flag	Cert		RL sult	Units	Dilution	RL		
Parameter		Flag	Cert		RL sult	Units	Dilution	RL		
Chloride		U		<2	20.0	m mg/Kg	5	4.00		
Sample: 39	02620 - CS-10									
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 121364 102683	W	Date	lytical Meth e Analyzed: pple Prepara	2015-	05-08	Prep Me Analyzeo Preparec	ł By: SC		
					RL					
$\frac{\text{Parameter}}{\text{DRO}}$		Flag	Cert		sult 50.0	Units mg/Kg	Dilution 1	RL 50.0		
Surrogate n-Tricosane	Flag	Cert	Result 102	Units mg/Kg	Dilution 1	Spike	Percent Recovery 102	Recovery Limits 70 - 130		
Sample: 39	02620 - CS-10									
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121361 102658		Date Ana	al Method: alyzed: Preparation:	S 8015 D 2015-05-08 2015-05-07		Prep Meth Analyzed I Prepared I	By: AK		

				RL				
Parameter	Flag	Cert		Result	Uni	ts	Dilution	RL
GRO ⁶	Qs,U	1		<8.00	mg/ŀ	Хg	2	4.00
C		C I		TT •/	D'1 /'	Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			3.35	m mg/Kg	2	4.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			3.74	$\mathrm{mg/Kg}$	2	4.00	94	70 - 130

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Sample: 392621 - CS-11

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Date Ana	l Method: lyzed: reparation	S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	3	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	s	1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg	r	1	0.0200
Ethylbenzene	U	1	<	0.0200	$\mathrm{mg/Kg}$	S	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	5	1	0.0200
Surrorata	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Surrogate	r lag	Cert						
Trifluorotoluene (TFT)			2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			2.20	m mg/Kg	1	2.00	110	70 - 130

Sample: 392621 - CS-11

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121342 102671	Date	ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392621 - CS-11

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - 1 121364 102683	NEW	Date	lytical Metho e Analyzed: ple Preparati	2015-0	5-08	Prep Me Analyzec Prepared	v
				F	L			
Parameter		Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			1	27	72	mg/Kg	1	50.0
Surrogate	Flag	g Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			120	m mg/Kg	1	100	120	70 - 130

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Sample: 392621 - CS-11

1										
Laboratory: Analysis: QC Batch:	Midland TPH GRO 121361			Analytic Date An	al Methoo alyzed:	d: S 8015 2015-0			Prep Metho Analyzed B	
Prep Batch:	102658				Preparatio	on: 2015-0)5-07		Prepared By	·
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO		$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)				1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluor	obenzene (4-BFB)				1.97	$\mathrm{mg/Kg}$	1	2.00	98	70 - 130

Sample: 392622 - CS-12

Laboratory:MidlandAnalysis:BTEXQC Batch:121360Prep Batch:102658		Analytica Date Ana Sample Pi		S 8021E 2015-05 2015-05	-08		Prep Method Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert]	Result	Units	5	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	S	1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg	S	1	0.0200
Ethylbenzene	U	1	<	0.0200	mg/Kg	S	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	S	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.25	mg/Kg	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)			2.27	mg/Kg	1	2.00	114	70 - 130

Sample: 392622 - CS-12

Laboratory: 1	Midland				
Analysis: 0	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch: 1	121342	Date Analyzed:	2015-05-07	Analyzed By:	EM
Prep Batch: 1	102671	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$

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sample 392622 continued							
Parameter	Flag	Cert	RL Result		Units	Dilution	RL
	0				0 0		
			RL				
Parameter	Flag	Cert	Result		Units	Dilution	RL
Chloride	U		<20.0)	m mg/Kg	5	4.00
Sample: 392622 - CS- Laboratory: Midland	12						
-		Date	lytical Method: e Analyzed: pple Preparation	2015-05	5-08	Prep Me Analyze Preparec	d By: SC
Laboratory: Midland Analysis: TPH DRO QC Batch: 121364 Prep Batch: 102683	- NEW	Date Sam	e Analyzed: pple Preparation RL	2015-05 n: 2015-05	5-08 5-07	Analyze Preparec	d By: SC d By: SC
Laboratory: Midland Analysis: TPH DRO QC Batch: 121364 Prep Batch: 102683 Parameter		Date Sam Cert	e Analyzed: pple Preparation RI Result	2015-05 n: 2015-05	5-08 5-07 Units	Analyzed Prepared Dilution	d By: SC d By: SC RL
Laboratory: Midland Analysis: TPH DRO QC Batch: 121364 Prep Batch: 102683	- NEW	Date Sam	e Analyzed: pple Preparation RL	2015-05 n: 2015-05	5-08 5-07	Analyze Preparec	d By: SC d By: SC
Laboratory: Midland Analysis: TPH DRO QC Batch: 121364 Prep Batch: 102683 Parameter DRO	- NEW	Date Sam Cert	e Analyzed: aple Preparation RL Result <50.0	2015-05 n: 2015-05	5-08 5-07 Units	Analyzed Prepared Dilution	d By: SC d By: SC RL

Sample: 392622 - CS-12

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121361 102658			Date An	al Methoo alyzed: Preparatio	2015-0	5-08		Prep Metho Analyzed B Prepared By	y: AK
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO		$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)				1.77	mg/Kg	1	2.00	88	70 - 130
4-Bromofluor	obenzene (4-BFB)				2.03	mg/Kg	1	2.00	102	70 - 130

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Sample: 392623 - CS-13

Laboratory:MidlandAnalysis:BTEXQC Batch:121360Prep Batch:102658		Date Ana	l Method: lyzed: reparation	S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	$\mathrm{mg/Kg}$	r 5	1	0.0200
Ethylbenzene	U	1	<	0.0200	mg/K_{2}	5	1	0.0200
Xylene	U	1	<	0.0200	mg/K_s	r S	1	0.0200
			_			Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.28	m mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)			2.26	$\mathrm{mg/Kg}$	1	2.00	113	70 - 130

Sample: 392623 - CS-13

Laboratory: Analysis: QC Batch: Prep Batch:	Chloride (Titration) 121342		tical Method: Analyzed: le Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392623 - CS-13

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEW 121364 102683		Date	lytical Metho e Analyzed: ple Preparat	2015-0	05-08	Prep Me Analyzec Preparec	•
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	<5	0.0	mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			90.0	m mg/Kg	1	100	90	70 - 130

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Sample: 392623 - CS-13

Laboratory: Midland Analysis: TPH GRO QC Batch: 121361 Prep Batch: 102658			Date An	al Methoo alyzed: Preparatio	2015-0	5-08		Prep Metho Analyzed B Prepared B	y: AK
					RL				
Parameter	Flag		Cert		Result	Unit	ts	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.77	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-E	BFB)			2.02	mg/Kg	1	2.00	101	70 - 130

Sample: 392624 - CS-14

Laboratory:MidlandAnalysis:BTEXQC Batch:121360Prep Batch:102658		Analytical Date Anal Sample Pr		S 8021E 2015-05 2015-05	-08		Prep Method Analyzed By Prepared By:	: AK
				RL				
Parameter	Flag	Cert]	Result	Units	5	Dilution	RL
Benzene	U	1	<(0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<(0.0200	mg/Kg	g	1	0.0200
Ethylbenzene	U	1	<(0.0200	mg/Kg	r S	1	0.0200
Xylene	U	1	</td <td>0.0200</td> <td>mg/Kg</td> <td>r,</td> <td>1</td> <td>0.0200</td>	0.0200	mg/Kg	r,	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.26	mg/Kg	1	2.00	113	70 - 130
4-Bromofluorobenzene (4-BFB)			2.26	$\mathrm{mg/Kg}$	1	2.00	113	70 - 130

Sample: 392624 - CS-14

Midland				
Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
121342	Date Analyzed:	2015-05-07	Analyzed By:	EM
102671	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$
	Chloride (Titration) 121342	Chloride (Titration)Analytical Method:121342Date Analyzed:	Chloride (Titration)Analytical Method:SM 4500-Cl B121342Date Analyzed:2015-05-07	Chloride (Titration)Analytical Method:SM 4500-Cl BPrep Method:121342Date Analyzed:2015-05-07Analyzed By:

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sample 392624 contin	<i>ued</i>							
Parameter	Flag	Cert	F Resi	L l+	Units	Dilution	RL	
	Tag	Cert	Itest	110	Onits	Dilution	111	
			F	L				
Parameter	Flag	Cert	Resu	lt	Units	Dilution	RL	
Chloride	U		<20	.0	mg/Kg	5	4.00	
		Ana	alytical Metho	d: S 8015	D	Prep Me	ethod: N/A	
Laboratory: Midland	d	Dat	e Analyzed: nple Preparati	2015-0 on: 2015-0	5-08	Prep Me Analyze Preparec	d By: SC	
Laboratory: Midland Analysis: TPH D QC Batch: 121364 Prep Batch: 102683	d RO - NEW	Dat San	e Analyzed: nple Preparati F	2015-09 on: 2015-09	5-08 5-07	Analyze Preparec	d By: SC d By: SC	
Laboratory: Midland Analysis: TPH D QC Batch: 121364	d	Dat	e Analyzed: nple Preparati	2015-09 on: 2015-09 L llt	5-08	Analyze	d By: SC	
Laboratory: Midland Analysis: TPH D QC Batch: 121364 Prep Batch: 102683 Parameter	d RO - NEW	Dat San Cert	e Analyzed: 1ple Preparati F Resu	2015-09 on: 2015-09 L llt	5-08 5-07 Units	Analyze Prepared Dilution	d By: SC d By: SC RL	

Sample: 392624 - CS-14

Laboratory:MidlandAnalysis:TPH GROQC Batch:121361Prep Batch:102658			Date An	al Methoo alyzed: Preparatio	2015-0	5-08		Prep Metho Analyzed B Prepared By	y: AK
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.76	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	$\mathrm{mg/Kg}$	1	2.00	100	70 - 130

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Sample: 392625 - CS-15

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Analytical Date Ana Sample Pr	lyzed:	2015-05	-08		Prep Method Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene ⁷	U	1	<	< 0.0400	mg/K	g	2	0.0200
Toluene	U	1	<	< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
Ethylbenzene	U	1	<	< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
Xylene	U	1	<	< 0.0400	$\mathrm{mg/K}$	g	2	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			4.40	mg/Kg	2	4.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			4.21	$\mathrm{mg/Kg}$	2	4.00	105	70 - 130

Sample: 392625 - CS-15

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121342 102671	Date	vtical Method: Analyzed: le Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 392625 - CS-15

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DR 121364 102683		N	Date	ytical Metho e Analyzed: ple Preparatio	2015-0	5-08	Prep Me Analyzec Prepared	l By: SC
					F	L			
Parameter			Flag	Cert	Resu	lt	Units	Dilution	RL
DRO				1	41	.8	mg/Kg	1	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		131	mg/Kg	1	100	131	70 - 130

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Sample: 392625 - CS-15		

Laboratory:MidlandAnalysis:TPH GROQC Batch:121361Prep Batch:102658		Date An	al Method: alyzed: Preparation	2015-0 n: 2015-0	5-08		Prep Metho Analyzed B Prepared B	y: AK
				RL				
Parameter	Flag	Cert]	Result	Uni	ts	Dilution	RL
GRO ⁸	$_{\rm Qs,U}$	1		<8.00	mg/K	Χg	2	4.00
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			3.42	mg/Kg	2	4.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			3.77	mg/Kg	2	4.00	94	70 - 130

Sample: 392626 - CS-16

Laboratory: Midland								
Analysis: BTEX		Analytica	l Method:	S 8021E	3		Prep Method	d: S 5035
QC Batch: 121360		Date Ana	lyzed:	2015-05	-08		Analyzed By	v: AK
Prep Batch: 102658		Sample Preparation:		2015-05	-07		Prepared By	r: AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	1	<	0.0200	mg/K	g	1	0.0200
Toluene	U	1	<	0.0200	mg/K	g	1	0.0200
Ethylbenzene	U	1	<	0.0200	mg/K	g	1	0.0200
Xylene	U	1	<	0.0200	mg/K	g	1	0.0200
						Spike	Percent	Recovery
Surrogate	Fla	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.28	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)			2.23	mg/Kg	1	2.00	112	70 - 130

Sample: 392626 - CS-16

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	121342	Date Analyzed:	2015-05-07	Analyzed By:	EM
Prep Batch:	102671	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$
			,	• 1	

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sample 39262	26 continued									
Parameter		Flag		Cert]	RL Result	Un	its	Dilution	RL
Parameter		Flag		Cert]	RL Result	Un		Dilution	RL
Chloride						98.0	mg/	Kg	5	4.00
Sample: 392	2626 - CS-16									
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEV 121364 102683	V		Dat	alytical Me te Analyze nple Prepa	d:	S 8015 D 2015-05-08 2015-05-07		Prep Met Analyzed Prepared	By: SC
				C I		RL	TT			DI
Parameter DRO		Flag		Cert		Result 126	Un mg/i		Dilution 1	RL 50.0
DIIO				1		120	mg/.	ng	L	50.0
Surrogate	Flag	Cert	-	Result	Units	Dil		Spike mount	Percent Recovery	Recovery Limits
n-Tricosane	0		-	99.1	mg/Kg		1	100	99	70 - 130
Sample: 392 Laboratory: Analysis: QC Batch: Prep Batch:	2626 - CS-16 Midland TPH GRO 121361 102658			Date An	al Method aalyzed: Preparatio	2015-	15 D -05-08 -05-07		Prep Metho Analyzed B Prepared B	y: AK
Parameter		Flag		Cert	1	RL Result	Un	its	Dilution	RL
GRO		Qs,U		1		<4.00	mg/		1	4.00
Surrogate			Flag	Cert	Result	Units mg/Kg	Dilution	Spike Amount 2.00	Percent Recovery 87	Recovery Limits 70 - 130
Trifluorotolue							1			

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Sample: 392627 - CS-17

Laboratory:MidlandAnalysis:BTEXQC Batch:121360Prep Batch:102658		Date Ana	l Method: lyzed: reparation:	S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	5	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg	r S	1	0.0200
Ethylbenzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	5	1	0.0200
~		~				Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.25	$\mathrm{mg/Kg}$	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)			2.29	$\mathrm{mg/Kg}$	1	2.00	114	70 - 130

Sample: 392627 - CS-17

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121342 102671	Date	ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2015-05-07 2015-05-07	Prep Method: Analyzed By: Prepared By:	,
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			98.0	mg/Kg	5	4.00

Sample: 392627 - CS-17

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 121364 102683	ŻW	Date	lytical Metho e Analyzed: ple Preparati	2015-0	5-08	Prep Me Analyzee Prepared	v
				F	RL			
Parameter		Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			1	13	31	m mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			95.6	mg/Kg	1	100	96	70 - 130

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Sample: 392627 - CS-17

1									
Laboratory: Midland Analysis: TPH GRO QC Batch: 121361			Date An	v	2015-0	05-08		Prep Metho Analyzed B	y: AK
Prep Batch: 102658			Sample 1	Preparatio	on: 2015-0	05-07		Prepared By	y: AK
Parameter	Flag		Cert		RL Result	Uni	ts	Dilution	RL
GRO	Qs,U		1		<4.00	mg/K	Ig	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.77	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-BFB))			1.99	mg/Kg	1	2.00	100	70 - 130

Sample: 392628 - CS-18

Laboratory: Midland Analysis: BTEX QC Batch: 121360		Analytica Date Ana	lyzed:	S 8021E 2015-05			Prep Method Analyzed By	
Prep Batch: 102658		Sample P	reparation: 2015-05-0		-07		Prepared By	: AK
				RL				
Parameter	Flag	Cert]	Result	Units	3	Dilution	RL
Benzene	U	1	<(0.0200	mg/Kg	r.	1	0.0200
Toluene	U	1	<(0.0200	$\mathrm{mg/Kg}$	S	1	0.0200
Ethylbenzene	U	1	<(0.0200	$\mathrm{mg/Kg}$	S	1	0.0200
Xylene	U	1	<(0.0200	mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.17	m mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			2.14	$\mathrm{mg/Kg}$	1	2.00	107	70 - 130

Sample: 392628 - CS-18

Analysis:Chloride (Titration)Analytical Method:SM 4500-Cl BPrep Method:N/AQC Batch:121342Date Analyzed:2015-05-07Analyzed By:EMPrep Batch:102671Sample Preparation:2015-05-07Prepared By:EM	Laboratory:	Midland				
	Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
Prep Batch: 102671 Sample Preparation: 2015-05-07 Prepared By: EM	QC Batch:	121342	Date Analyzed:	2015-05-07	Analyzed By:	EM
	Prep Batch:	102671	Sample Preparation:	2015-05-07	Prepared By:	$\mathbf{E}\mathbf{M}$

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sample 39262	28 continued								
					RL				
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL	
					RL				
Parameter		Flag	Cert	Res		Units	Dilution	RL	
Chloride		U	0.010		0.0	mg/Kg	5	4.00	
G1 200	DCD0 CC 10								
Sample: 392	2628 - CS-18								
Laboratory:	Midland								
Analysis:	TPH DRO - NE	W		lytical Meth			Prep Me	'	
QC Batch:	121364			e Analyzed:	2015-0		Analyzee		
Prep Batch:	102683		San	ple Preparat	ion: 2015-0	5-07	Preparec	l By: SC	
					RL				
Parameter		Flag	Cert	Res		Units	Dilution	RL	
DRO		0	1	6	3.7	mg/Kg	1	50.0	
						Spike	Percent	Recovery	
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits	
n-Tricosane	1 1008	0010	93.8	mg/Kg	1	100	94	70 - 130	
Sample: 392	2628 - CS-18								
Laboratory:	Midland								
Analysis:	TPH GRO		Analytics	al Method:	S 8015 D		Prep Meth	od: S 5035	
QC Batch:	121361		Date Ana		2015-05-08		Analyzed 1		
Prep Batch:	102658			Preparation:	2015-05-07		Prepared I		

Sample: 39	Sample: 392628 - CS-18									
Laboratory:	Midland									
Analysis:	TPH GRO	Analytical Method:	S 8015 D							
QC Batch:	121361	Date Analyzed:	2015-05-08							
Prep Batch	102658	Sample Preparation:	2015-05-07							

Prep Batch: 102658		Sample	Prepared B	y: AK				
				RL				
Parameter	Flag	Cert		Result	Uni	ts	Dilution	RL
GRO	$_{\rm Qs,U}$	1		<4.00 mg/Kg		1	4.00	
						Spike	Percent	Recovery
Surrogate	Fl	ag Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.71	m mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.92	$\mathrm{mg/Kg}$	1	2.00	96	70 - 130

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Sample: 392629 - CS-19

Laboratory: Midland Analysis: BTEX QC Batch: 121360 Prep Batch: 102658		Date Ana	l Method: lyzed: reparation	S 8021E 2015-05 : 2015-05	-08		Prep Method Analyzed By: Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	5	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg	r S	1	0.0200
Ethylbenzene	U	1	<	0.0200	m mg/Kg	5	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	5	1	0.0200
		C I		TT •/		Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.20	m mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			2.15	m mg/Kg	1	2.00	108	70 - 130

Sample: 392629 - CS-19

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121366 102692	Date A	ical Method: analyzed: e Preparation:	SM 4500-Cl B 2015-05-08 2015-05-08	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			287	mg/Kg	5	4.00

Sample: 392629 - CS-19

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 121364 102683	ŻW	Date	lytical Metho e Analyzed: ple Preparat	2015-0)5-08	Prep Me Analyzec Preparec	v
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO			1	<5	0.0	m mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			86.3	m mg/Kg	1	100	86	70 - 130

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Sample: 392629 - CS-19

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121361 102658			Date An	al Methoo alyzed: Preparatio	2015-0)5-08		Prep Metho Analyzed B Prepared B	y: AK
Trop Datom	102000			Sampio	roparatie				Troponou D _i	,
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO		$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)		0		1.71	mg/Kg	1	2.00	86	70 - 130
	obenzene (4-BFB)				1.92	mg/Kg	1	2.00	96	70 - 130

Sample: 392630 - CS-20

Laboratory:MidlandAnalysis:BTEXQC Batch:121360Prep Batch:102658		Analytical Date Ana Sample Pr		S 8021E 2015-05 2015-05	-08		Prep Method Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert]	Result	Units	3	Dilution	RL
Benzene	U	1	<().0200	mg/Kg	5	1	0.0200
Toluene	U	1	<(0.0200	mg/Kg	5	1	0.0200
Ethylbenzene	U	1	<(0.0200	mg/Kg	5	1	0.0200
Xylene	U	1	<	0.0200	mg/Kg	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.27	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)			2.22	mg/Kg	1	2.00	111	70 - 130

Sample: 392630 - CS-20

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Met	hod: N/A
QC Batch:	121366	Date Analyzed:	2015-05-08	Analyzed	By: EM
Prep Batch:	102692	Sample Preparation:	2015-05-08	Prepared	By: EM

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sample 3926	30 continued							
					RL			
Parameter		Flag	Cert	Re	sult	Units	Dilution	RL
					RL			
Parameter		Flag	Cert	Re	sult	Units	Dilution	RL
Chloride		U		<:	20.0	m mg/Kg	5	4.00
Sample: 39	2630 - CS-20							
Laboratory:	Midland							
Analysis:	TPH DRO - NE	W		lytical Meth			Prep Me	/
QC Batch: Prep Batch:	$121364 \\ 102683$			e Analyzed: ple Prepara	2015-0 tion: 2015-0		Analyzed Prepared	
i iep Daten.	102005		Dan	ipic i repara	0011. 2010-0	0-01	Tiepareu	Ъу. 50
					RL			
Parameter		Flag	Cert		sult	Units	Dilution	RL
DRO		U	1	<;	50.0	m mg/Kg	1	50.0
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			85.5	m mg/Kg	1	100	86	70 - 130
Sample: 39	2630 - CS-20							
Laboratory:	Midland							
Analysis:	TPH GRO			al Method:	S 8015 D		Prep Meth	
QC Batch:	121361		Date An	v	2015-05-08		Analyzed H	
Prep Batch:	102658		Sample I	Preparation:	2015-05-07		Prepared E	By: AK
					RL			

					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	$_{\rm Qs,U}$		1		<4.00	mg/K	g	1	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.76	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-BFB)				1.96	$\mathrm{mg/Kg}$	1	2.00	98	70 - 130

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Sample: 392631 - CS-21

Laboratory: Midland Analysis: BTEX QC Batch: 121396 Prep Batch: 102695		Date Ana	l Method: lyzed: reparation	2015-05	-11		Prep Method Analyzed By Prepared By:	AK
				RL				
Parameter	Flag	Cert		Result	Unit	s	Dilution	RL
Benzene	U	1	<	(0.0200	mg/Kg	r S	1	0.0200
Toluene	U	1	<	(0.0200)	$\mathrm{mg/Kg}$	r 5	1	0.0200
Ethylbenzene	U	1	<	(0.0200)	mg/K_{2}	r 5	1	0.0200
Xylene	U	1	<	(0.0200	mg/K_s	5	1	0.0200
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
	Flag	Cert			1	2.00	114	70 - 130
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)			$2.28 \\ 2.27$	mg/Kg mg/Kg	1	2.00 2.00	114 114	70 - 130 70 - 130
4-DIOIIIOIIUOIODEllZelle (4-DFD)			2.21	mg/ Kg	1	2.00	114	10 - 150

Sample: 392631 - CS-21

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 121366 102692	Date A	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2015-05-08 2015-05-08	Prep Method: Analyzed By: Prepared By:	ÉM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			96.0	mg/Kg	5	4.00

Sample: 392631 - CS-21

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 121397 102684	Ċ₩	Date	lytical Metho e Analyzed: ple Preparat	2015-0)5-11	Prep Me Analyzee Prepared	v
				1	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO		Qs	1	<50).0	mg/Kg	1	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			101	m mg/Kg	1	100	101	70 - 130

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Sample: 392631 - CS-21						
Laboratory: Midland						
Analysis: TPH GRO		Analytical N	Iethod: S 8015	D	Prep Method:	S 5035
QC Batch: 121435		Date Analyz	ed: 2015-0	5-12	Analyzed By:	AK
Prep Batch: 102727		Sample Prep	paration: 2015-0	5-11	Prepared By:	AK
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.91	mg/Kg	1	2.00	96	70 - 130

Sample: 392632 - CS-22

Laboratory: Midland Analysis: BTEX QC Batch: 121396 Prep Batch: 102695		Analytica Date Ana Sample Pr		S 8021E 2015-05 2015-05	-11		Prep Methoo Analyzed By Prepared By	: AK
				RL				
Parameter	Flag	Cert		Result	Units	5	Dilution	RL
Benzene	U	1	<	0.0200	mg/Kg		1	0.0200
Toluene	U	1	<	0.0200	m mg/Kg		1	0.0200
Ethylbenzene	U	1	<	0.0200	m mg/Kg		1	0.0200
Xylene	U	1	<	0.0200	mg/Kg		1	0.0200
Surrogate	Fla	g Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5 5020	2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			2.22	mg/Kg	1	2.00	111	70 - 130

Sample: 392632 - CS-22

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	121366	Date Analyzed:	2015-05-08	Analyzed By:	EM
Prep Batch:	102692	Sample Preparation:	2015-05-08	Prepared By:	EM
				1	

continued ...

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sample 39263	$32 \ continued \ldots$							
Parameter		Flag	Cert	Res	RL sult	Units	Dilution	RL
Parameter		Flag	Cert	Res		Units	Dilution	RL
Chloride				٩	574	mg/Kg	5	4.00
Sample: 39 Laboratory: Analysis: QC Batch: Prep Batch:	2632 - CS-22 Midland TPH DRO - NE 121397 102684	W	Date	ytical Meth Analyzed: ple Preparat	2015-	05-11	Prep Me Analyzec Preparec	l By: SC
Parameter		Flag	Cert	Res	RL	Units	Dilution	RL
DRO		Qs	1		0.0	mg/Kg	1	50.0
Surrogate n-Tricosane	Flag	Cert	Result 87.5	Units mg/Kg	Dilution 1	Spike Amount 100	Percent Recovery 88	Recovery Limits 70 - 130
Sample: 39	2632 - CS-22							
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121435 102727		Date Ana	l Method: lyzed: reparation:	S 8015 D 2015-05-12 2015-05-11		Prep Meth Analyzed I Prepared F	By: AK
Parameter		Flag	Cert	Res	RL sult	Units	Dilution	RL
GRO		U	1		.00	mg/Kg	1	4.00

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.84	mg/Kg	1	2.00	92	70 - 130
4-Bromofluorobenzene (4-BFB)			1.81	$\mathrm{mg/Kg}$	1	2.00	90	70 - 130

Method Blanks

Method Blank (1)	QC Batch: 121337					
QC Batch: 121337 Prep Batch: 102667		Date Analyzed: QC Preparation:	$\begin{array}{c} 2015\text{-}05\text{-}07 \\ 2015\text{-}05\text{-}07 \end{array}$		Analyzed By: Prepared By:	
Parameter	Flag	Cert		MDL Result	Units	RL
Chloride	rag	Cert		<3.85	mg/Kg	4

QC Batch: 121342		Date Analyzed:		Analyzed By:	
Prep Batch: 102671		QC Preparation:	2015-05-07	Prepared By:	ЕM
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Chloride			<3.85	mg/Kg	4

Method Blank (1) QC Batch: 121360

QC Batch: 121360 Prep Batch: 102658			analyzed: eparation:	2015-05-0 2015-05-0			l By: AK By: AK	
					MDL			
Parameter	Flag		Cert		Result		Units	RL
Benzene			1		< 0.00533	1	0.02	
Toluene			1		$<\!0.00645$	mg/Kg		0.02
Ethylbenzene			1		< 0.0116	mg/Kg		0.02
Xylene			1		< 0.00874]	mg/Kg	0.02
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.22	mg/Kg	1	2.00	111	70 - 130
4-Bromofluorobenzene (4-BFB)			2.24	$\mathrm{mg/Kg}$	1	2.00	70 - 130	

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Method Blank (1) QC B	Batch: 121361							
QC Batch: 121361 Prep Batch: 102658		analyzed: eparation:	2015-05-08 2015-05-07			Analyzed By: AK Prepared By: AK		
					MDL			
Parameter	Flag		Cert		Result		Units	RL
GRO			1		$<\!2.32$		m mg/Kg	4
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)		2.00	mg/Kg	1	2.00	100	70 - 130	

Method Blank (2	L) QC I	Batch: 1213	864					
QC Batch: 1213 Prep Batch: 1026	-			Analyzed: reparation:	2015-05-08 2015-05-07		Analyz Prepare	*
Parameter		Fla	g	Cert		MDL Result	Units	RL
DRO				1		<7.41	m mg/Kg	50
Surrogate n-Tricosane	Flag	Cert	Result 96.9	Units mg/Kg	Dilution 1	Spike Amount 100	Percent Recovery 97	Recovery Limits 70 - 130

Method Blank (1)	QC Batch: 121366				
QC Batch: 121366 Prep Batch: 102692		Date Analyzed: QC Preparation:	2015-05-08 2015-05-08	Analyzed By: Prepared By:	
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	m mg/Kg	4

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Method Blank (1) Q	C Batch: 121396							
QC Batch: 121396 Prep Batch: 102695	Date Ana QC Prepa	•	2015-05-1 2015-05-0			l By: AK By: AK		
_					MDL		_	·
Parameter	Flag		Cert		Result		Units	RL
Benzene			1		< 0.00533		m mg/Kg	0.02
Toluene			1		< 0.00645		mg/Kg	0.02
Ethylbenzene			1		< 0.0116	1	mg/Kg	0.02
Xylene			1		< 0.00874]	mg/Kg	0.02
						Spike	Percent	Recovery
Surrogate	Flag	Cert I	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.29	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BF	FB)		2.30	mg/Kg	1	2.00	115	70 - 130

Method Blank (1) QC Batch: 121397

QC Batch: Prep Batch:	$\frac{121397}{102684}$				Analyzed: reparation:	$\begin{array}{c} 2015 \text{-} 05 \text{-} 11 \\ 2015 \text{-} 05 \text{-} 07 \end{array}$		•	ed By: SC ed By: SC
							MDL		
Parameter			Flag		Cert		Result	Units	RL
DRO					1	<7.41		m mg/Kg	50
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		8		98.4	mg/Kg	1	100	98	70 - 130

Method Blank (1) QC Batch: 121435

QC Batch: 121435		Date A	analyzed:	2015-05-1	2		Analyzed 1		
Prep Batch: 102727		QC Pr	eparation:	2015-05-1	1		Prepared		
					MDL				
Parameter	Flag		Cert		Result		Units	RL	
GRO			1		$<\!2.32$		m mg/Kg	4	
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotoluene (TFT)	0		1.92	mg/Kg	1	2.00	96	70 - 130	
ii					cont	inued			

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method blank continued						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
4-Bromofluorobenzene (4-BFB)			1.90	mg/Kg	1	2.00	95	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 121	337		Date	Analyzed	l: 201	5-05-07			Anal	yzed By	: EM
Prep Batch: 102	667		QC I	Preparatio	on: 201	5-05-07			Prepa	ared By	: EM
				LCS			Spike	Mat	trix		Rec.
Param		F	C 1	Result	Units	Dil.	Amount	Res	sult R	ec.	Limit
Chloride				2500	mg/Kg	5	2500	<1	9.2 1	8 00	85 - 115
Percent recovery i	s based on the spike	e resu	lt. RPD	is based o	on the sp	oike and sp	ike duplica	ate resul	lt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2300	mg/Kg	5	2500	<19.2	92	85 - 115	8	20
Democrat maccorrows	a bagad on the anily			is based a	n the er	iles and an	ilea duralia	ata nagul	14		

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:	121342 102671		Date Analyzed:2015-05-07Analyzed By:QC Preparation:2015-05-07Prepared By:							
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		Г	U	2450	mg/Kg	<u> </u>	2500	<19.2	98	85 - 115
Percent recov	very is based on th	ie spike resu	ılt. RI	PD is based	0, 0	ke and s	pike duplicat	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2450	$\mathrm{mg/Kg}$	5	2500	<19.2	98	85 - 115	0	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:	121360	Date Analyzed:	2015-05-08	Analyzed By:	AK
Prep Batch:	102658	QC Preparation:	2015-05-07	Prepared By:	AK

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			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	2.56	mg/Kg	1	2.00	< 0.00533	128	70 - 130
Toluene		1	2.34	m mg/Kg	1	2.00	$<\!0.00645$	117	70 - 130
Ethylbenzene		1	2.31	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	116	70 - 130
Xylene		1	6.88	mg/Kg	1	6.00	< 0.00874	115	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.	Limit	RPD	Limit
Benzene		1	2.21	mg/Kg	1	2.00	< 0.00533	110	70 - 130	15	20
Toluene		1	2.04	$\mathrm{mg/Kg}$	1	2.00	$<\!0.00645$	102	70 - 130	14	20
Ethylbenzene		1	2.06	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	103	70 - 130	11	20
Xylene		1	6.13	mg/Kg	1	6.00	< 0.00874	102	70 - 130	12	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.11	2.17	mg/Kg	1	2.00	106	108	70 - 130
4-Bromofluorobenzene (4-BFB)	2.27	2.23	$\mathrm{mg/Kg}$	1	2.00	114	112	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:	121361		D	ate Analyz	ed: 2015-	-05-08		I	Analyzed	By: AK
Prep Batch:	102658		Q	C Prepara	tion: 2015-	-05-07		I	Prepared	By: AK
							<i></i>			_
				LCS			Spike	Matrix		$\operatorname{Rec.}$
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO			1	14.0	m mg/Kg	1	20.0	$<\!\!2.32$	70	70 - 130

			LCSD			Spike	e .	Matrix		Re	c.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amou	nt	Result	Rec.	Lin	nit	RPD	Limit
GRO		1	15.1	mg/Kg	1	20.0		$<\!2.32$	76	70 -	130	8	20
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.													
			LCS	S LCS	$^{\rm SD}$			Sp	ike	LCS	LCS	SD	Rec.
Surrogate			Resu	lt Res	ılt	Units	Dil	. Ame	ount	Rec.	Re	c.	Limit
Trifluorotoluene (TFT)			1.71	. 1.7	6	mg/Kg	1	2.	00	86	88	3	70 - 130
4-Bromofluorobenzene (4-BFB)			2.08	3 2.1	0	m mg/Kg	1	2.	00	104	10	5	70 - 130

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Laboratory Control Spike (LCS-1)							
QC Batch: 121364		Date A	Analyzed: 201	5-05-08			Analyzed	By: SC
Prep Batch: 102683		QC Pi	reparation: 201	5-05-07			Prepared	By: SC
		L	\mathbf{CS}		Spike	Matrix	ζ	Rec.
Param	\mathbf{F}		esult Units	Dil.	Amount	Result		Limit
DRO		1 2	215 mg/Kg	1	250	<7.41		70 - 130
Percent recovery is based on the	e spike resu	lt. RPD is	based on the sp	ike and s	pike duplica	te result.		
		LCSD		Spike	Matrix		Rec.	RPD
Param	F C	Result	Units Dil.	Amount	Result		Limit RP	
DRO	1	204	mg/Kg 1	250	<7.41	82 70	- 130 5	20
Percent recovery is based on the	e spike resu	lt. RPD is	based on the sp	oike and s	pike duplica	ate result.		
	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
	07.0		177					
n-Tricosane	97.2	88.8	mg/Kg	1	100	97	89	70 - 130
Laboratory Control Spike (QC Batch: 121366		Date A	Analyzed: 201	1 5-05-08 5-05-08	100	97	89 Analyzed Prepared	By: EM
Laboratory Control Spike (QC Batch: 121366 Prep Batch: 102692	LCS-1)	Date A QC Pr L	Analyzed: 201 reparation: 201 CS	5-05-08 5-05-08	Spike	Matrix	Analyzed Prepared I	By: EM By: EM Rec.
Laboratory Control Spike (QC Batch: 121366 Prep Batch: 102692 Param		Date A QC Pr L C Re	Analyzed: 201 eparation: 201 CS ssult Units	5-05-08 5-05-08 Dil.	Spike Amount	Matriz Result	Analyzed Prepared 2 c c Rec.	By: EM By: EM Rec. Limit
Prep Batch: 102692 Param Chloride	LCS-1) F	Date A QC Pr L C Re 24	Analyzed: 201 reparation: 201 CS csult Units 490 mg/Kg	5-05-08 5-05-08 Dil. 5	Spike Amount 2500	Matriz Result <19.2	Analyzed Prepared 2 c c Rec.	By: EM By: EM Rec.
Laboratory Control Spike (QC Batch: 121366 Prep Batch: 102692 Param	LCS-1) F	Date A QC Pr L C Re 24	Analyzed: 201 reparation: 201 CS csult Units 490 mg/Kg	5-05-08 5-05-08 Dil. 5	Spike Amount 2500	Matriz Result <19.2	Analyzed Prepared 2 c c Rec.	By: EM By: EM Rec. Limit
Laboratory Control Spike (QC Batch: 121366 Prep Batch: 102692 Param Chloride Percent recovery is based on the	LCS-1) F e spike resu	Date A QC Pr L C Re 24	Analyzed: 201 reparation: 201 CS esult Units 490 mg/Kg based on the sp	5-05-08 5-05-08 Dil. 5 bike and sp Spike	Spike Amount 2500	Matrix Result <19.2 ate result.	Analyzed Prepared Rec.	By: EM By: EM Rec. Limit 85 - 115 RPD
Laboratory Control Spike (QC Batch: 121366 Prep Batch: 102692 Param Chloride	LCS-1) F	Date A QC Pr L C Re 24 It. RPD is LCSD Result	Analyzed: 201 reparation: 201 CS csult Units 490 mg/Kg	5-05-08 5-05-08 Dil. 5 vike and sp	Spike Amount 2500 pike duplica	Matrix Result <19.2 ate result.	Analyzed Prepared Rec.	By: EM By: EM Rec. Limit 85 - 115 RPD

Laboratory Control Spike (LCS-1)

QC Batch:	121396	Date Analyzed:	2015-05-11	Analyzed By:	$\mathbf{A}\mathbf{K}$
Prep Batch:	102695	QC Preparation:	2015-05-08	Prepared By:	AK

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			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	2.29	mg/Kg	1	2.00	< 0.00533	114	70 - 130
Toluene		1	2.09	m mg/Kg	1	2.00	$<\!0.00645$	104	70 - 130
Ethylbenzene		1	2.14	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	107	70 - 130
Xylene		1	6.36	mg/Kg	1	6.00	< 0.00874	106	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.	Limit	RPD	Limit
Benzene		1	2.19	mg/Kg	1	2.00	< 0.00533	110	70 - 130	4	20
Toluene		1	2.03	$\mathrm{mg/Kg}$	1	2.00	< 0.00645	102	70 - 130	3	20
Ethylbenzene		1	2.02	mg/Kg	1	2.00	< 0.0116	101	70 - 130	6	20
Xylene		1	6.02	mg/Kg	1	6.00	< 0.00874	100	70 - 130	6	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.00	2.10	mg/Kg	1	2.00	100	105	70 - 130
4-Bromofluorobenzene (4-BFB)	2.24	2.24	$\mathrm{mg/Kg}$	1	2.00	112	112	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:	121397		D	ate Analyz	zed: 2015	-05-11			Analyzed	By: SC
Prep Batch:	102684		Q	C Prepara	tion: 2015	-05-07			Prepared	By: SC
				LCS			Spike	Matrix		$\operatorname{Rec.}$
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO			1	199	mg/Kg	1	250	<7.41	80	70 - 130

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	204	mg/Kg	1	250	<7.41	82	70 - 130	2	20
Percent recovery is based on the	spike	resul	t. RPD i	s based or	n the s	pike and sp	oike duplic	ate resu	ult.		
	LC	\mathbf{cs}	LCSI)			Spike	LC	S LCS	D	Rec.
Surrogate	Res	ult	Resul	t Un	its	Dil.	Amount	Rec	e. Rec		Limit
n-Tricosane	96	.6	96.2	mg	/Kg	1	100	97	96		70 - 130

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Laboratory Control Spike (LC	CS-1)										
QC Batch: 121435				e Analyz		2015-05-12					Analyzed	v
Prep Batch: 102727			QU	Prepara	tion: .	2015-05-11	-				Prepared	By: AK
				LCS				Spike	Ν	Iatrix		Rec.
Param		F	\mathbf{C}	Result	Uni	ts Dil	. A	Amount	F	Result	Rec.	Limit
GRO			1	15.6	mg/	Kg 1		20.0	<	<2.32	78	70 - 130
Percent recovery is based on the s	pike	resu	lt. RPD	is based	d on the	e spike and	l spike	duplic	ate re	sult.		
			LCSD			Spike	e N	Iatrix		Re	c.	RPD
Param	\mathbf{F}	С	Result	Unit	s Di	l. Amou	nt F	Result	Rec.	Lin	nit RI	PD Limit
GRO		1	15.4	mg/ŀ	Kg 1	20.0	<	<2.32	77	70 -	130 1	1 20
Percent recovery is based on the s	pike	resu	lt. RPD	is based	d on the	e spike and	l spike	duplic	ate re	sult.		
			L	CS L	CSD			Spi	ke	LCS	LCSD	Rec.
Surrogate					\mathbf{e} sult	Units	Dil.	Ame		Rec.	Rec.	Limit
Trifluorotoluene (TFT)			1.	84	1.88	mg/Kg	1	2.0)0	92	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.	99	1.96	$\mathrm{mg/Kg}$	1	2.0)0	100	98	70 - 130

Matrix Spikes

Matrix Spike (MS-1)	Spiked San	-										
QC Batch: 121337			Dat	e Analyze	ed: 20	15-05-07				Analy	zed By:	EM
Prep Batch: 102667			QC	Preparati	ion: 20	15-05-07				Prepa	red By:	EM
				MS			Spike	Ma	atrix			Rec.
Param]	F	C I	Result	Units	Dil.	Amount		sult	Rec.		Limit
Chloride				2200	mg/Kg	5	2500	<1	19.2	88	78.	9 - 121
Percent recovery is based on	the spike	resul	t. RPD	is based	on the s	spike and s	pike dupli	cate res	sult.			
			MSD			Spike	Matrix		Re	20		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Lir		RPD	Limit
·		0	2300	mg/Kg		2500	<19.2	92	78.9		4	20
Chloride Percent recovery is based on	the spike	resul		-, -						121		
Percent recovery is based on	-		t. RPE	is based						121		
Percent recovery is based on Matrix Spike (MS-1)	the spike Spiked Sar		t. RPD	is based	on the s	spike and s						
Percent recovery is based on Matrix Spike (MS-1) S QC Batch: 121342	-		t. RPD 392628 Dat	e Analyze	on the s ed: 20	spike and s 15-05-07				Analy	zed By:	EM
Percent recovery is based on Matrix Spike (MS-1)	-		t. RPD 392628 Dat	is based	on the s ed: 20	spike and s				Analy		EM
Percent recovery is based on Matrix Spike (MS-1) S QC Batch: 121342	-		t. RPD 392628 Dat	e Analyze Preparati	on the s ed: 20	spike and s 15-05-07	pike dupli	cate res	sult.	Analy	zed By: red By:	EM EM
Percent recovery is based on Matrix Spike (MS-1) QC Batch: 121342 Prep Batch: 102671	Spiked Sar	nple:	t. RPD 392628 Dat QC	e Analyze Preparati MS	on the s ed: 20 ion: 20	spike and s 15-05-07 15-05-07	pike dupli Spike	cate res	sult.	Analy Prepa	zed By: red By:	EM EM Rec.
Percent recovery is based on Matrix Spike (MS-1) S QC Batch: 121342	Spiked Sar		t. RPD 392628 Dat QC	e Analyze Preparati	on the s ed: 20	spike and s 15-05-07 15-05-07 Dil.	pike dupli	cate res Ma Re	sult.	Analy	zed By: red By: I	EM EM Rec.
Percent recovery is based on Matrix Spike (MS-1) QC Batch: 121342 Prep Batch: 102671 Param Chloride	Spiked Sar	nple: F	t. RPD 392628 Dat QC C 1	e Analyze Preparati MS Result 2450	on the s ed: 20 ion: 20 Units mg/Kg	spike and s 15-05-07 15-05-07 Dil. 5	spike dupli Spike Amount 2500	cate res Ma Re <1	sult. atrix sult 19.2	Analy Prepa Rec.	zed By: red By: I	EM EM Rec.
Percent recovery is based on Matrix Spike (MS-1) QC Batch: 121342 Prep Batch: 102671 Param	Spiked Sar	nple: F	t. RPD 392628 Dat QC t. RPD	e Analyze Preparati MS Result 2450	on the s ed: 20 ion: 20 Units mg/Kg	spike and s 15-05-07 15-05-07 Dil. 5 spike and s	Spike Amount 2500 spike dupli	cate res Ma Re <1	sult. sult. sult sult.	Analy Prepa Rec. 98	zed By: red By: I	EM EM Rec. Limit 9 - 121
Percent recovery is based on Matrix Spike (MS-1) QC Batch: 121342 Prep Batch: 102671 Param Chloride	Spiked Sar	nple: F resul	t. RPD 392628 Dat QC C 1	e Analyze Preparati MS Result 2450	on the s ed: 20 ion: 20 Units mg/Kg	spike and s 15-05-07 15-05-07 Dil. 5	spike dupli Spike Amount 2500	cate res Ma Re <1	sult. atrix sult 19.2	Analy Prepa Rec. 98	zed By: red By: I	EM EM Rec.

Matrix Spike (MS-1)	Spiked Sample: 392611
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QC Batch:	121360	Date Analyzed:	2015-05-08	Analyzed By:	AK
Prep Batch:	102658	QC Preparation:	2015-05-07	Prepared By:	AK

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Param	F	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
	Г	U			DII.				
Benzene		1	2.21	m mg/Kg	1	2.00	< 0.00533	110	70 - 130
Toluene		1	1.99	m mg/Kg	1	2.00	$<\!0.00645$	100	70 - 130
Ethylbenzene		1	2.03	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	102	70 - 130
Xylene		1	6.04	mg/Kg	1	6.00	< 0.00874	101	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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		1	2.27	mg/Kg	1	2.00	< 0.00533	114	70 - 130	3	20
Toluene		1	2.02	$\mathrm{mg/Kg}$	1	2.00	$<\!0.00645$	101	70 - 130	2	20
Ethylbenzene		1	2.05	mg/Kg	1	2.00	< 0.0116	102	70 - 130	1	20
Xylene		1	6.11	mg/Kg	1	6.00	< 0.00874	102	70 - 130	1	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.10	2.06	mg/Kg	1	2	105	103	70 - 130
4-Bromofluorobenzene (4-BFB)	2.18	2.20	$\mathrm{mg/Kg}$	1	2	109	110	70 - 130

Matrix Spike (MS-1) Spiked Sample: 392611

QC Batch:	121361	Date Analyzed:	2015-05-08	Analyzed By:	$\mathbf{A}\mathbf{K}$
Prep Batch:	102658	QC Preparation:	2015-05-07	Prepared By:	AK

				MS			Spike	Matrix		Rec.
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	Qs	$_{\rm Qs}$	1	13.4	m mg/Kg	1	20.0	<2.32	67	70 - 130

			MSD			Spike	Ma	atrix		Rec			RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amoun	it Re	esult	Rec.	Lim	it	RPD	Limit
GRO		1	15.0	mg/Kg	1	20.0	<	2.32	75	70 - 1	.30	11	20
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.													
			MS	S MS	SD			Spi	ike	MS	MS	D	Rec.
Surrogate			Rest	ult Res	sult	Units	Dil.	Amo	ount	Rec.	Re	c.	Limit
Trifluorotoluene (TFT)			1.6	4 1.	69	mg/Kg	1	2	2	82	84	1	70 - 130
4-Bromofluorobenzene (4-BFB)			1.9	8 2.	07	$\mathrm{mg/Kg}$	1	2	2	99	10	4	70 - 130

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Matrix Spike (MS-1)	Spiked Sample	: 392615								
QC Batch: 121364 Prep Batch: 102683			v	15-05-08 15-05-07			Analyze Prepare			
Param DRO	F	C Rest 1 19	ult Units 7 mg/Kg		Spike Amount 250	Matrix Result 21.8	Rec. 70	Rec. Limit 70 - 130		
Percent recovery is based or	n the spike resu	ılt. RPD is l	based on the sp	pike and s	pike duplica	ate result.				
Param DRO	F C		Units Dil. ng/Kg 1	Spike Amount 250	Matrix Result 21.8	Rec. L	Rec. imit R - 130	$\begin{array}{c} \text{RPD} \\ \text{RPD} \\ 0 \\ \end{array}$		
Percent recovery is based or	n the spike resu		-, -				- 130	0 20		
Tereent recovery is based of	-		ased on the sp	Since and 5			MOD	Ð		
Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit		
n-Tricosane	90.4	89.3	mg/Kg	1	100	90	89	70 - 130		
Matrix Spike (MS-1)	Spiked Sample									
QC Batch: 121366 Prep Batch: 102692		Date Ar QC Prej	v	5-05-08 5-05-08			Analyze Prepare	v		
			paration: 201		Spike	Matrix	v	v		
Prep Batch: 102692 Param	F	QC Prey MS C Resu	paration: 201		Spike Amount	Result	Prepare Rec.	d By: EM Rec. Limit		
Prep Batch: 102692 Param Chloride		QC Prej MS C Resu 3060	paration: 201 5 1t Units 0 mg/Kg	5-05-08 Dil. 5	Amount 2500	Result 574	Prepare	d By: EM Rec.		
Prep Batch: 102692 Param		QC Prej MS C Resu 3060	paration: 201 5 1t Units 0 mg/Kg	5-05-08 Dil. 5	Amount 2500	Result 574	Prepare Rec.	d By: EM Rec. Limit		
Prep Batch: 102692 Param Chloride		QC Prej MS C Resu 3060	paration: 201 5 1t Units 0 mg/Kg	$\frac{\text{Dil.}}{5}$	Amount 2500	Result 574 ate result.	Prepare Rec.	d By: EM Rec. Limit		
Prep Batch: 102692 Param Chloride		QC Prej MS <u>C Resu</u> 3060 Ilt. RPD is b MSD Result U	paration: 201 the Units 0 mg/Kg pased on the sp	$\frac{\text{Dil.}}{5}$	Amount 2500 pike duplica Matrix Result	Result 574 ate result. Rec. Li	Prepared Rec. 99 ec.	d By: EM Rec. Limit 78.9 - 121		

QC Batch:	121396	Date Analyzed:	2015-05-11	Analyzed By:	AK
Prep Batch:	102695	QC Preparation:	2015-05-08	Prepared By:	AK

Matrix Spike (MS-1) Spiked Sample: 392631

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5	T	a	MS	TT 1	DU	Spike	Matrix	Ð	Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	2.04	m mg/Kg	1	2.00	< 0.00533	102	70 - 130
Toluene		1	1.88	m mg/Kg	1	2.00	$<\!0.00645$	94	70 - 130
Ethylbenzene		1	1.91	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	96	70 - 130
Xylene		1	5.69	mg/Kg	1	6.00	< 0.00874	95	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}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		1	2.32	mg/Kg	1	2.00	< 0.00533	116	70 - 130	13	20
Toluene		1	2.12	$\mathrm{mg/Kg}$	1	2.00	< 0.00645	106	70 - 130	12	20
Ethylbenzene		1	2.13	$\mathrm{mg/Kg}$	1	2.00	< 0.0116	106	70 - 130	11	20
Xylene		1	6.40	$\mathrm{mg/Kg}$	1	6.00	< 0.00874	107	70 - 130	12	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)	2.08	2.16	mg/Kg	1	2	104	108	70 - 130
4-Bromofluorobenzene (4-BFB)	2.22	2.26	$\mathrm{mg/Kg}$	1	2	111	113	70 - 130

Matrix Spike (MS-1) Spiked Sample: 392631

QC Batch:	121397	Date Analyzed:	2015-05-11	Analyzed By:	\mathbf{SC}
Prep Batch:	102684	QC Preparation:	2015-05-07	Prepared By:	\mathbf{SC}

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	191	m mg/Kg	1	250	8.02	73	70 - 130

			MSD			Spike	Matrix		Rec.		RPD	
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
DRO Qs	$_{\rm Qs}$	1	181	$\mathrm{mg/Kg}$	1	250	8.02	69	70 - 130	5	20	
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.												
	Μ	\mathbf{S}	MSD				Spike	\mathbf{M}	S MSI)	Rec.	
Surrogate	Res	ult	Resul	t Un	its	Dil.	Amount	Re	c. Rec		Limit	
n-Tricosane	90	.8	86.2	mg/	′Kg	1	100	91	. 86	,	70 - 130	

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Matrix Spike (MS-1) Spiked Sar	nple:	392610								
QC Batch: 121435 Prep Batch: 102727			e Analyzed Preparatio)15-05-12)15-05-11				Analyzed Prepared	v
			MS			Sp	ike	Matrix		Rec.
Param	F	C I	Result	Units	B Dil.	Am	ount	Result	Rec.	Limit
GRO		1	35.3	mg/K	g 2	40	0.0	<4.64	88	70 - 130
Percent recovery is based on the spike	resu	lt. RPD	is based o	on the	spike and s	spike dı	plicate	result.		
		MSD			Spike	Mat	rix	Re	ec.	RPD
Param F	С	Result	Units	Dil.	Amount	Res	ilt Re	ec. Lir	nit R	PD Limit
GRO	1	36.0	m mg/Kg	2	40.0	<4.	64 9	0 70 -	130	2 20
Percent recovery is based on the spike	resu	lt. RPD	is based o	on the	spike and s	spike dı	plicate	result.		
		Ν	IS MS	SD			Spike	MS	MSD	Rec.
Surrogate		Re	sult Res	sult	Units	Dil.	Amour	t Rec.	Rec.	Limit
Trifluorotoluene (TFT)		3.	63 3.	59	mg/Kg	2	4	91	90	70 - 130
4-Bromofluorobenzene (4-BFB)		4.	00 3.3	85	$\mathrm{mg/Kg}$	2	4	100	96	70 - 130

Calibration Standards

Standard (ICV-1)

QC Batch:	121337	Date Analyzed: 20			2015-05-07		Analyz	Analyzed By: EM		
					ICVs	ICVs	ICVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride				mg/Kg	100	99.0	99	85 - 115	2015-05-07	

Standard (CCV-1)

QC Batch:	121337	1337 Date Analyzed:			2015-05-07		Analy	Analyzed By: EM		
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride				m mg/Kg	100	101	101	85 - 115	2015-05-07	

Standard (ICV-1)

QC Batch:	121342		Date Analyzed:			2015-05-07		Analyz	Analyzed By: EM		
					ICVs	ICVs	ICVs	Percent			
					True	Found	Percent	Recovery	Date		
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride				m mg/Kg	100	100	100	85 - 115	2015-05-07		

Standard (CCV-1)

QC Batch:	121342	2		Date Analyzed:				Analy	Analyzed By: EM	
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
		1 145	Cert				2		$\frac{2015-05-07}{2015-05-07}$	
Chloride				m mg/Kg	100	100	100	85 - 115	2015-05	

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Standard (CCV-1)

QC Batch: 121360			Date An	alyzed: 20	Analyzed By: AK			
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.118	118	80 - 120	2015-05-08
Toluene		1	m mg/kg	0.100	0.103	103	80 - 120	2015-05-08
Ethylbenzene		1	m mg/kg	0.100	0.0994	99	80 - 120	2015-05-08
Xylene		1	mg/kg	0.300	0.301	100	80 - 120	2015-05-08

Standard (CCV-2)

QC Batch: 121360			Date An	alyzed: 20	Analyzed By: AK			
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.120	120	80 - 120	2015-05-08
Toluene		1	m mg/kg	0.100	0.107	107	80 - 120	2015-05-08
Ethylbenzene		1	m mg/kg	0.100	0.103	103	80 - 120	2015-05-08
Xylene		1	mg/kg	0.300	0.303	101	80 - 120	2015-05-08

Standard (CCV-3)

QC Batch: 121360			Date An	alyzed: 20	Analyzed By: AK			
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.119	119	80 - 120	2015-05-08
Toluene		1	m mg/kg	0.100	0.106	106	80 - 120	2015-05-08
Ethylbenzene		1	m mg/kg	0.100	0.102	102	80 - 120	2015-05-08
Xylene		1	m mg/kg	0.300	0.301	100	80 - 120	2015-05-08

Standard (CCV-1)

QC Batch: 121361

Date Analyzed: 2015-05-08

Analyzed By: AK

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	m mg/Kg	1.00	0.864	86	80 - 120	2015-05-08
Standard (C	CCV-2)							
QC Batch: 121361			Date	Analyzed:	2015-05-08		Analy	zed By: AK
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
1 aram	riag	Oert			0.795	80	80 - 120	2015-05-08
GRO Standard ((CCV 2)	1	mg/Kg	1.00	0.795	80	80 - 120	2013-03-00
GRO Standard (C QC Batch:	,	1			2015-05-08			zed By: AK
Standard (C	,	1		Analyzed: CCVs	2015-05-08 CCVs	$\rm CCVs$	Analy Percent	zed By: AK
Standard (C QC Batch: 1	121361		Date	Analyzed: CCVs True	2015-05-08 CCVs Found	CCVs Percent	Analy Percent Recovery	zed By: AK Date
Standard (C QC Batch: Param	,	ı Cert		Analyzed: CCVs	2015-05-08 CCVs	$\rm CCVs$	Analy Percent	zed By: AK Date Analyzed
Standard (C QC Batch: Param GRO	121361 Flag	Cert	Date	Analyzed: CCVs True Conc.	2015-05-08 CCVs Found Conc.	CCVs Percent Recovery	Analy Percent Recovery Limits	zed By: AK Date
Standard (C QC Batch: Param	121361 Flag	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 1.00	2015-05-08 CCVs Found Conc.	CCVs Percent Recovery	Analy Percent Recovery Limits 80 - 120	zed By: AK Date Analyzed
Standard (C QC Batch: Param GRO Standard (C	121361 Flag	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 1.00	2015-05-08 CCVs Found Conc. 0.814	CCVs Percent Recovery	Analy Percent Recovery Limits 80 - 120	zed By: AK Date Analyzed 2015-05-08
Standard (C QC Batch: Param GRO Standard (C	121361 Flag	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 1.00 Analyzed: CCVs	2015-05-08 CCVs Found Conc. 0.814 2015-05-08 CCVs	CCVs Percent Recovery 81 CCVs	Analy Percent Recovery Limits 80 - 120 Analy Percent	zed By: AK Date <u>Analyzed</u> 2015-05-08 yzed By: SC

Standard (CCV-2)

QC Batch: 121364

Date Analyzed: 2015-05-08

Analyzed By: SC

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				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		1	mg/Kg	250	220	88	80 - 120	2015-05-08	
Standard (C	CCV-3)								
QC Batch: 121364			Date	Analyzed:	2015-05-08		Analy	zed By: SC	
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DDO	0	1	mg/Kg	250	203	81	80 - 120	2015-05-08	
DRO		1							
Standard (I	CV-1) 21366	1			2015-05-08			zed By: EM	
Standard (I	,	1		Analyzed: ICVs		ICVs	Analy Percent	zed By: EM	
Standard (I QC Batch: 1	.21366		Date .	Analyzed: ICVs True	2015-05-08 ICVs Found	ICVs Percent	Analy Percent Recovery	Date	
Standard (I QC Batch: 1 Param	,	Cert	Date . Units	Analyzed: ICVs True Conc.	2015-05-08 ICVs Found Conc.	Percent Recovery	Analy Percent Recovery Limits	Date Analyzed	
Standard (I	.21366		Date .	Analyzed: ICVs True	2015-05-08 ICVs Found	Percent	Analy Percent Recovery		
Standard (I QC Batch: 1 Param	.21366 Flag		Date . Units	Analyzed: ICVs True Conc.	2015-05-08 ICVs Found Conc.	Percent Recovery	Analy Percent Recovery Limits	Date Analyzed	
Standard (I QC Batch: 1 Param Chloride Standard (C	.21366 Flag		Date . Units mg/Kg	Analyzed: ICVs True Conc. 100	2015-05-08 ICVs Found Conc.	Percent Recovery	Analy Percent Recovery Limits 85 - 115	Date Analyzed 2015-05-03	
Standard (I QC Batch: 1 Param Chloride Standard (C	21366 Flag		Date . Units mg/Kg	Analyzed: ICVs True Conc. 100	2015-05-08 ICVs Found Conc. 101	Percent Recovery	Analy Percent Recovery Limits 85 - 115	Date Analyzed 2015-05-08	
Standard (I QC Batch: 1 Param Chloride Standard (C	21366 Flag		Date . Units mg/Kg	Analyzed: ICVs True Conc. 100 Analyzed:	2015-05-08 ICVs Found Conc. 101 2015-05-08	Percent Recovery 101	Analy Percent Recovery Limits 85 - 115 Analy	Date Analyzed 2015-05-08	
Standard (I QC Batch: 1 Param Chloride Standard (C	21366 Flag		Date . Units mg/Kg	Analyzed: ICVs True Conc. 100 Analyzed: CCVs	2015-05-08 ICVs Found Conc. 101 2015-05-08 CCVs	Percent Recovery 101 CCVs	Analy Percent Recovery Limits 85 - 115 Analy Percent	Date Analyzed 2015-05-08 zed By: EM	

Standard (CCV-1)

QC Batch: 121396

Date Analyzed: 2015-05-11

Analyzed By: AK

Report Date: May 7250715028	13, 2015		Wc 1009	Page Number: 57 of 60				
				$\rm CCVs$	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.118	118	80 - 120	2015-05-11
Toluene		1	mg/kg	0.100	0.104	104	80 - 120	2015-05-11
Ethylbenzene		1	mg/kg	0.100	0.102	102	80 - 120	2015-05-11
Xylene		1	mg/kg	0.300	0.303	101	80 - 120	2015-05-11

Standard (CCV-2)

QC Batch: 121396			Date An	alyzed: 20	Analyzed By: AK			
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.112	112	80 - 120	2015-05-11
Toluene		1	m mg/kg	0.100	0.100	100	80 - 120	2015-05-11
Ethylbenzene		1	m mg/kg	0.100	0.0962	96	80 - 120	2015-05-11
Xylene		1	mg/kg	0.300	0.283	94	80 - 120	2015-05-11

Standard (CCV-1)

QC Batch:	121397		Date	Analyzed:	2015-05-11		Analyzed By: SC	
				$\rm CCVs$	CCVs	$\rm CCVs$	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	218	87	80 - 120	2015-05-11

Standard (CCV-2)

QC Batch:	121397	Date Analyzed:		2015-05-11		Analyzed By: SC		
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
				Inte	round	rercent	necovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	m mg/Kg	250	219	88	80 - 120	2015-05-11

Report Date: May 13, 2015 7250715028			Work Order: 15050632 1009 Relief Valve Release				Page Number: 58 of 60	
Standard (C	CCV-1)							
QC Batch: 121435			Date Analyzed: 2015-05-12				Analyzed By: AK	
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.904	90	80 - 120	2015-05-12

Standard (CCV-2)

QC Batch:	121435		Date Analyzed: 2		2015-05-12		Analyzed By: AK	
				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	0.835	84	80 - 120	2015-05-12

Appendix

Report Definitions

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

Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-14-8	Midland

Standard Flags

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

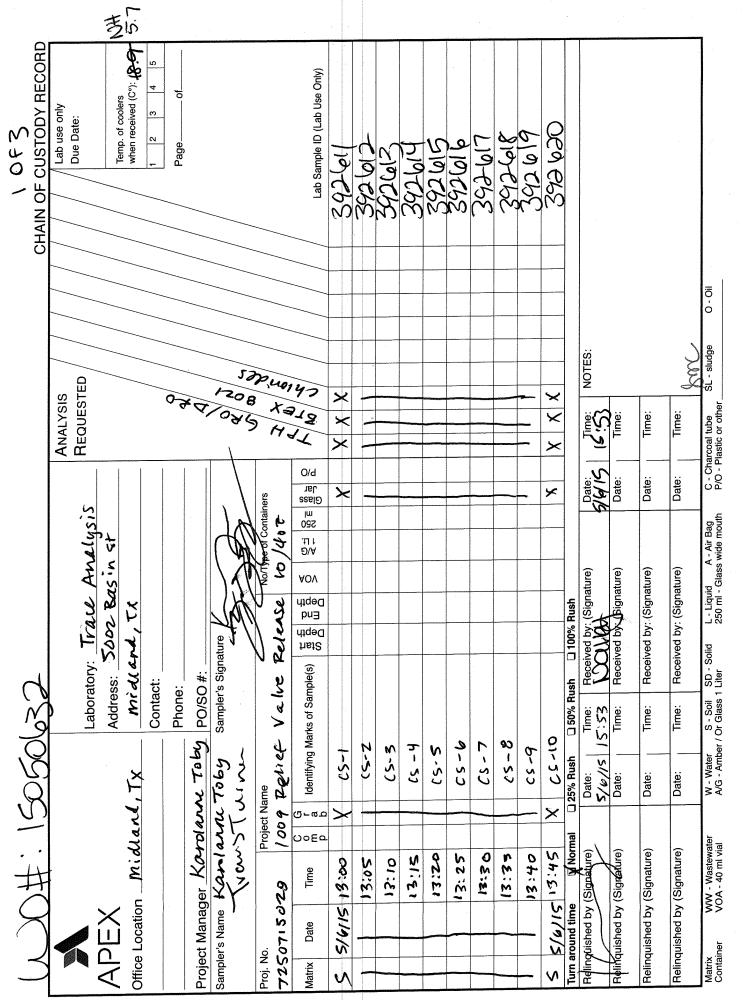
Result Comments

Work Order: 15050632 1009 Relief Valve Release Page Number: 60 of 60

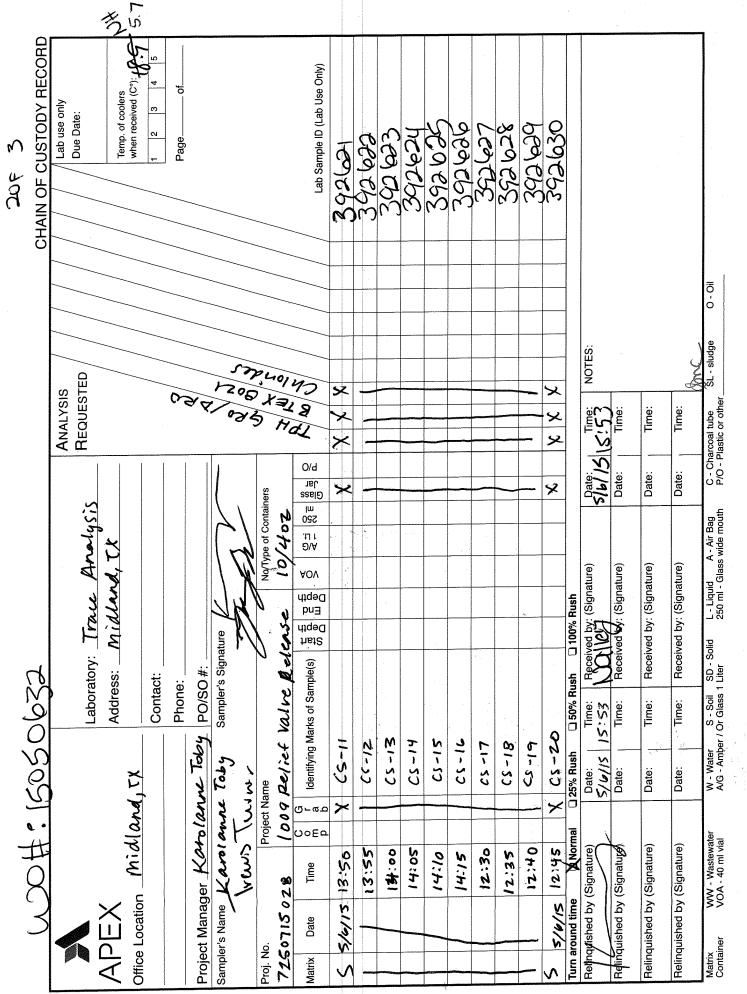
- 1 Dilution due to surfactants.
- 2 Dilution due to surfactants.
- 3 Dilution due to surfactants.
- 4 Dilution due to surfactants.
- 5 Dilution due to surfactants.
- 6 Dilution due to surfactants.
- 7 Dilution due to surfactants.
- 8 Dilution due to surfactants.

Attachments

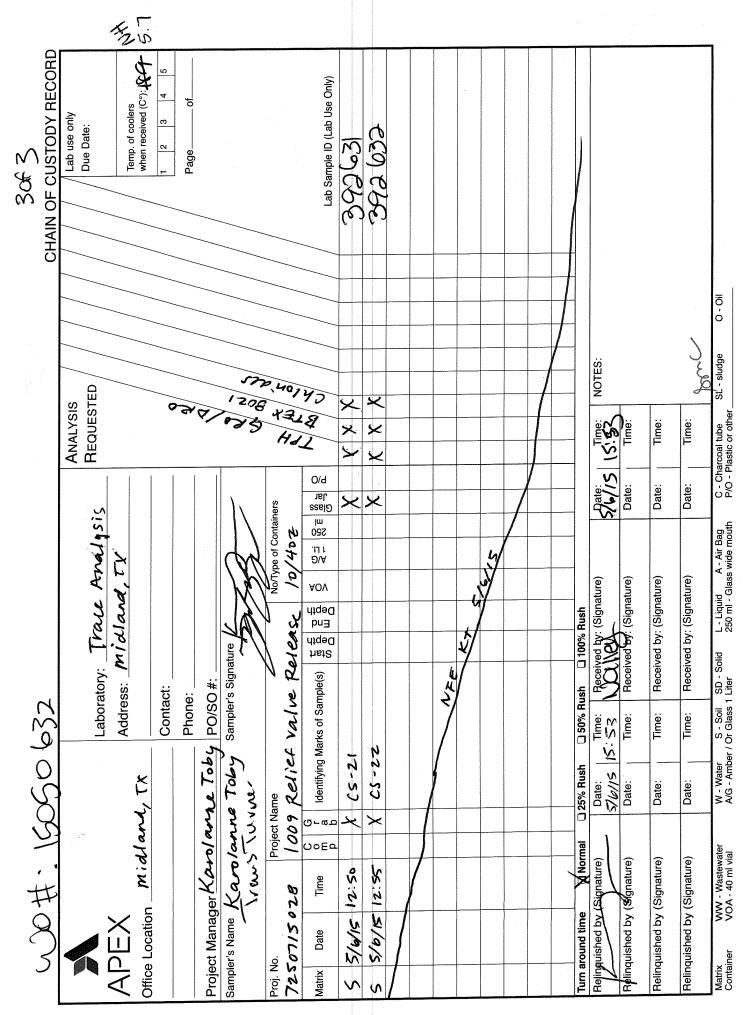
The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.



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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Karolanne Toby APEX/Titan 2351 W. Northwest Hwy. Suite 3321 Dallas, Tx, 75220

Report Date: May 14, 2015

Work Order:	15050631

1009 Relief Valve Release **Project** Name: Project Number: 7250715028

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
392589	1-Veg	soil	2015-05-06	10:20	2015-05-06
392590	2-Veg	soil	2015-05-06	10:25	2015-05-06
392591	3-Veg	soil	2015-05-06	10:15	2015-05-06
392592	4-Veg	soil	2015-05-06	10:10	2015-05-06
392593	5-Veg	soil	2015-05-06	10:05	2015-05-06
392594	6-Veg	soil	2015-05-06	10:00	2015-05-06
392595	7-Veg	soil	2015-05-06	09:55	2015-05-06
392596	8-Veg	soil	2015-05-06	09:50	2015-05-06
392597	9-Veg	soil	2015-05-06	09:45	2015-05-06
392598	10-Veg	soil	2015-05-06	09:40	2015-05-06
392599	11-Veg	soil	2015-05-06	09:30	2015-05-06
392600	12-Veg	soil	2015-05-06	09:35	2015-05-06
392601	13-Veg	soil	2015-05-06	09:20	2015-05-06
392602	14-Veg	soil	2015-05-06	09:25	2015-05-06
392603	15-Veg	soil	2015-05-06	09:15	2015-05-06
392604	16-Veg	soil	2015-05-06	09:12	2015-05-06
392605	17-Veg	soil	2015-05-06	11:00	2015-05-06
392606	18-Veg	soil	2015-05-06	11:05	2015-05-06

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392607	19-Veg	soil	2015-05-06	11:10	2015-05-06
392608	20-Veg	soil	2015-05-06	11:15	2015-05-06
392609	21-Veg	soil	2015-05-06	11:20	2015-05-06
392610	22-Veg	soil	2015-05-06	11:25	2015-05-06

Notes

• Work Order 15050631: straight from field , not on ice

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.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 37 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lefturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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QC Batch 121472 - Method Blank (1) QC Batch 121502 - Method Blank (1) Laboratory Control Spikes QC Batch 121435 - LCS (1) QC Batch 121445 - LCS (1) QC Batch 121451 - LCS (1) QC Batch 121472 - LCS (1) QC Batch 121472 - LCS (1) QC Batch 121502 - LCS (1) QC Batch 121502 - LCS (1)	24 24 26 26 26 27 27 27 28 29

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Case Narrative

Samples for project 1009 Relief Valve Release were received by TraceAnalysis, Inc. on 2015-05-06 and assigned to work order 15050631. Samples for work order 15050631 were received intact at a temperature of 18.9 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
TPH DRO - NEW	S 8015 D	102720	2015-05-08 at 18:00	121445	2015-05-12 at 12:46
TPH DRO - NEW	S 8015 D	102733	2015-05-11 at $14:16$	121449	2015-05-12 at $14:01$
TPH DRO - NEW	S 8015 D	102733	2015-05-11 at 14:16	121451	2015-05-12 at $15:02$
TPH GRO	S 8015 D	102727	2015-05-11 at $11:22$	121435	2015-05-12 at $10:39$
TPH GRO	S 8015 D	102750	2015-05-12 at $10:11$	121472	2015-05-13 at $10:45$
TPH GRO	S 8015 D	102792	2015-05-13 at $15:07$	121502	2015-05-14 at $09:34$

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 15050631 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Analytical Report

Sample: 392589 - 1-Veg

Laboratory:	Midland								
Analysis:	TPH DR	O - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121445	445		Date	Date Analyzed:		-12	Analyzed	l By: SC
Prep Batch:	102720			Sample Preparation: 2015-05-08				Prepared	By: SC
					F	RL			
Parameter			Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			Qs	1	37	70	m mg/Kg	2	50.0
Surrogata		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent	Recovery Limits
Surrogate		гıag	Cert					Recovery	
n-Tricosane	Qsr	Qsr		260	m mg/Kg	2	100	260	70 - 130

Sample: 392589 - 1-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727	PH GROAnalytical Method:S 8015 D1435Date Analyzed:2015-05-122727Sample Preparation:2015-05-11								d: S 5035 y: AK y: AK
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	U		1		<8.00	mg/K	g	2	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				3.69	mg/Kg	2	4.00	92	70 - 130
4-Bromofluorobenzene (4-BFI	3)			3.72	$\mathrm{mg/Kg}$	2	4.00	93	70 - 130

Sample: 392590 - 2-Veg

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	121445	Date Analyzed:	2015-05-12	Analyzed By:	\mathbf{SC}
Prep Batch:	102720	Sample Preparation:	2015-05-08	Prepared By:	\mathbf{SC}

Report Date: M 7250715028	t Date: May 14, 2015 Work Order: 15050631 15028 1009 Relief Valve Release									Page Number: 7 of 37		
Parameter			Flag		Cert		RL Result		Unit	G	Dilution	RL
$\frac{1}{\text{DRO}}$			Qs		1		484		mg/K_{g}	-	2	50.0
									S	pike	Percent	Recovery
Surrogate		Flag	Cer	t	Result	Units		ution		nount	Recovery	Limits
n-Tricosane	Qsr	Qsr			267	$\mathrm{mg/K}$	g	2		100	267	70 - 130
Analysis: T QC Batch: 12	fidland PH GR(21435)2727	О			Date An	al Methoo alyzed: Preparatio	2015-0	05-12			Prep Metho Analyzed B Prepared B	y: AK
							RL					
Parameter			Flag		Cert		Result		Unit		Dilution	RL
GRO			U		1		<8.00	1	mg/K	g	2	4.00
Surrogate Trifluorotoluene 4-Bromofluorobe	· · · ·	4-BFB)		Flag	Cert	Result 3.68 3.75	Units mg/Kg mg/Kg	Dilut 2 2		Spike Amount 4.00 4.00	Percent Recovery 92 94	Recovery Limits 70 - 130 70 - 130
Sample: 39259	91 - 3-1	√eg										

Laboratory: Analysis: QC Batch: Prep Batch:	TPH DRO - NEW 121445		Date	lytical Metho e Analyzed: ple Preparati	2015-05	5-12	Prep Me Analyzeo Prepareo	l By: SC	
					F	RL			
Parameter			Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			Qs	1	60	62	mg/Kg	2	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		285	m mg/Kg	2	100	285	70 - 130

Report Date: May 14, 2015 7250715028			Page Number: 8 of 37						
Sample: 392591 - 3-Veg									
Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727	Analytical Method:S 8015 DDate Analyzed:2015-05-12Sample Preparation:2015-05-11						Prep Metho Analyzed B Prepared B	y: AK	
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	U		1		<8.00	mg/K	g	2	4.00
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)				3.66	mg/Kg	2	4.00	92	70 - 130
4-Bromofluorobenzene (4-BFB)				4.53	$\mathrm{mg/Kg}$	2	4.00	113	70 - 130

Sample: 392592 - 4-Veg

Laboratory:	Midland								
Analysis:	TPH DR	O - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121449			Date	Analyzed:	2015-05	5-12	Analyzed	l By: SC
Prep Batch:	102733			Sam	ple Preparati	on: 2015-05	5-11	Prepared	By: SC
					т	RL			
_				~		-			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	1	34	40	mg/Kg	2	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		268	m mg/Kg	2	100	268	70 - 130

Sample: 392592 - 4-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121435 102727		Analytical M Date Analyze Sample Prepa		5-12	Prep Method: Analyzed By: Prepared By:	AK
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
GRO		U	1	<8.00	m mg/Kg	2	4.00

Report Date: May 14, 2015 7250715028			Work Orde 009 Relief	Page Number: 9 of 37				
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)			$3.65 \\ 5.09$	m mg/Kg $ m mg/Kg$	$\frac{2}{2}$	$4.00 \\ 4.00$	91 127	70 - 130 70 - 130

Sample: 392593 - 5-Veg

Laboratory:	Midland								
Analysis:	TPH DR	O - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121449			Date	Analyzed:	2015-05	5-12	Analyzed	l By: SC
Prep Batch:	102733			Sam	ple Preparati	on: 2015-05	5-11	Prepared	By: SC
					F	RL			
Parameter			Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	1	138	80	mg/Kg	2	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
0			Cert					·	
n-Tricosane	Qsr	Qsr		169	m mg/Kg	2	100	169	70 - 130

Sample: 392593 - 5-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727			Date An	al Methoo alyzed: Preparatio	2015-0	5-12		Prep Metho Analyzed B Prepared B	y: AK
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	U		1		<8.00	mg/K	g	2	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		8	0.010	3.16	mg/Kg	2	4.00	79	70 - 130
4-Bromofluorobenzene (4-BFB)				3.43	mg/Kg	2	4.00	86	70 - 130

Report Date 7250715028	e: May 14,	, 2015			ork Order: 15 9 Relief Valve			Page Num	ber: 10 of 37
Sample: 39	2594 - 6-	-Veg							
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DH 121449 102733	l RO - NEV	W	Date	lytical Metho e Analyzed: ple Preparati	2015-0	5-12	Prep Me Analyzee Preparec	d By: SC
					I	RL			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{\rm Qr,Qs}$	1	8'	76	m mg/Kg	2	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		166	mg/Kg	2	100	166	70 - 130

Sample: 392594 - 6-Veg

Laboratory: Midland									
Analysis: TPH GRO			Analytic	al Method	l: S 8015	5 D		Prep Metho	d: S 5035
QC Batch: 121435			Date An	alyzed:	2015-0	5-12		Analyzed B	y: AK
Prep Batch: 102727			Sample 1	Preparatio	on: 2015-0	5-11		Prepared By	y: AK
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	U		1		<8.00	mg/k	g	2	4.00
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)				3.39	mg/Kg	2	4.00	85	70 - 130
4-Bromofluorobenzene (4-BFB))			3.49	$\mathrm{mg/Kg}$	2	4.00	87	70 - 130

Sample: 392595 - 7-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEV 121449 102733	W	Date A	cal Method: nalyzed: Preparation:	S 8015 D 2015-05-12 2015-05-11	Prep Method: Analyzed By: Prepared By:	\dot{SC}
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
DRO		$_{ m Qr,Qs}$	1	668	mg/Kg	2	50.0

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Surrogate Fl	ag Ce	rt	Result	Units	Dilu		Spike mount	Percent Recovery	Recovery Limits		
n-Tricosane _{Qsr} _Q		10	286	mg/Kg		2	100	286	70 - 130		
Sample: 392595 - 7-Veg											
Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727			Date An	al Method: alyzed: Preparation	$\begin{array}{r} {\rm S} \ 8015\\ 2015-0\\ {\rm :} \ \ 2015-0\end{array}$	5-12		Prep Metho Analyzed B Prepared B	y: AK		
					RL						
Parameter	Flag		Cert	R	esult	Uni	$^{ m ts}$	Dilution	RL		
GRO	U		1	<	<8.00	mg/k	(g	2	4.00		
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent	Recovery Limits		
Trifluorotoluene (TFT)		riag	Uert		mg/Kg	2	4.00	Recovery 89	$\overline{70 - 130}$		
4-Bromofluorobenzene (4-B	FB)			3.50 3.52	mg/Kg	$\frac{2}{2}$	4.00	88	70 - 130		

Sample: 392596 - 8-Veg

Laboratory:	Midland								
Analysis:	TPH DR	O - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121449			Date	Analyzed:	2015-05	5-12	Analyzed	l By: SC
Prep Batch:	102733			Sam	ple Preparati	on: 2015-05	5-11	Prepared	By: SC
					_	_			
					R	L			
Parameter			Flag	Cert	Resu	lt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	1	92	29	mg/Kg	2	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		210	mg/Kg	2	100	210	70 - 130

Sample: 392596 - 8-Veg

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	121435	Date Analyzed:	2015-05-12	Analyzed By:	AK
Prep Batch:	102727	Sample Preparation:	2015-05-11	Prepared By:	AK

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		~	-	RL			D .1	
	Flag	Cert		Result	Unit		Dilution	RL
	U	1		<8.00	mg/K	g	2	4.00
	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
'FT)	0		3.53	mg/Kg	2	4.00	88	70 - 130
			3.55	mg/Kg	2	4.00	89	70 - 130
49	V	Analytical Method:S 8015 DDate Analyzed:2015-05-12Sample Preparation:2015-05-11				Prep Met Analyzed Prepared	By: SC	
				RL				
	Flag	Cert						RL
	$_{\rm Qr,Qs}$	1		1830	mg/K	g	2	50.0
Flag	Cert	Result	Units	Dilu		-	Percent Recovery	Recovery Limits
sr Qsr		294	mg/Kg	5 2	2	100	294	70 - 130
	149 733 Flag	- 9-Veg land I DRO - NEW 149 733 Flag Qr,Qs Flag Cert	$\begin{tabular}{c}{llllllllllllllllllllllllllllllllll$	FlagCertResult TFT)3.53zene (4-BFB)3.55- 9-VeglandI DRO - NEWAnalytical Me[49]Date Analyzed733Sample PrepaFlagCertFQr,Qs1FlagCertResultUnits	Flag Cert Result Units TFT) 3.53 mg/Kg zene (4-BFB) 3.55 mg/Kg - 9-Veg 3.55 mg/Kg land Analytical Method: S 1 DRO - NEW Analytical Method: S 233 Date Analyzed: 20 733 Sample Preparation: 20 RL Flag Cert Result Qr.Qs 1 1830 Flag Cert Result Flag Cert Result	FlagCertResultUnitsDilution $(4-BFB)$ 3.53 mg/Kg 2 ene $(4-BFB)$ 3.55 mg/Kg 2 ene $(4-BFB)$ 3.55 mg/Kg 2 ene $(4-BFB)$ 3.55 mg/Kg 2 ene $4-BFB$ 3.55 mg/Kg 2 ene $4-BFB$ $2015-05-12$ $2015-05-12$ and $analyzed:2015-05-12analyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:2015-05-11RLanalyzed:11830mg/Kanalyzed:11830mg/Kanalyzed:11830mg/K$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$

Prep Batch: 102727		Sample	Prepared B	y: AK				
				RL				
Parameter	Flag	Cert		Result	Unit	ts	Dilution	RL
GRO	U	1	<8.00		mg/Kg		2	4.00
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			3.53	mg/Kg	2	4.00	88	70 - 130
4-Bromofluorobenzene (4-BFB)			3.51	$\mathrm{mg/Kg}$	2	4.00	88	70 - 130

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Sample: 392598 - 10-Veg		
Laboratory: Midland Analysis: TPH DRO - NEW	Analytical Method: S 8015 D	Prep Method: N/A

QC Batch: Prep Batch:	121449 102733				v		5-12 5-11	Analyzed Prepared	•	
1					R			1	v	
Parameter			Flag	Cert	Resu	lt	Units	Dilution	Ι	RL
DRO			$_{ m Qr,Qs}$	1	119	0	m mg/Kg	2	50	0.0
Surrogato		Flog	Cert	Result	Units	Dilution	Spike Amount	Percent	Recove Limit	v
Surrogate		Flag	Cert			Dilution		Recovery		
n-Tricosane	Qsr	Qsr		266	m mg/Kg	2	100	266	70 - 13	30

Sample: 392598 - 10-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727			Date An	al Method alyzed: Preparatic	2015-0	5-12		Prep Metho Analyzed B Prepared B	y: AK
					RL				
Parameter	Flag		Cert		Result	Unit	ts	Dilution	RL
GRO	U		1		<8.00	mg/K	g	2	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				3.57	mg/Kg	2	4.00	89	70 - 130
4-Bromofluorobenzene (4-BFl	3)			3.55	$\mathrm{mg/Kg}$	2	4.00	89	70 - 130

Sample: 392599 - 11-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEW 121449 102733		alytical Method: te Analyzed: nple Preparation:	S 8015 D 2015-05-12 2015-05-11	Prep Method: Analyzed By: Prepared By:	\dot{SC}
			RL			
Parameter	Fla	g Cert	Result	Units	Dilution	RL
DRO	Qr, G	s 1	1350	mg/Kg	2	50.0

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Surrogate Fla	g Ce	rt	Result	Units	Dilu		Spike mount	Percent Recovery	Recovery Limits	
n-Tricosane _{Qsr} _{Qsr}	0	10	290	mg/Kg	-	2	100	290	70 - 130	
Sample: 392599 - 11-Veg										
Laboratory: Midland Analysis: TPH GRO QC Batch: 121435 Prep Batch: 102727			Date An	al Method: alyzed: Preparation	S 8015 2015-0 : 2015-0	5-12		Prep Metho Analyzed B Prepared B	y: AK	
					RL					
Parameter	Flag		Cert	Re	esult	Uni	$^{\mathrm{ts}}$	Dilution	RL	
GRO	U		1	<	8.00	mg/k	Kg	2	4.00	
							Spike	Percent	Recovery	
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits	
Trifluorotoluene (TFT)					mg/Kg	2	4.00	78	70 - 130	
4-Bromofluorobenzene (4-BF	̈́Β)			3.33	mg/Kg	2	4.00	83	70 - 130	

Sample: 392600 - 12-Veg

Laboratory:	Midland								
Analysis:	TPH DR	RO - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121451			Date	Analyzed:	2015-05	5-12	Analyzed	l By: SC
Prep Batch:	102733			Sam	ple Preparati	on: 2015-05	5-11	Prepared	l By: SC
					F	RL			
Parameter			Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			$_{\rm Qs}$	1	136	30	m mg/Kg	4	50.0
a			C .				Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		316	m mg/Kg	4	100	316	70 - 130

Sample: 392600 - 12-Veg

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	121435	Date Analyzed:	2015-05-12	Analyzed By:	AK
Prep Batch:	102727	Sample Preparation:	2015-05-11	Prepared By:	AK

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				C . I		RL		TT •/				DI
Parameter GRO			Flag	Cert		Result <8.00		Units mg/Kg		Dilution 2		RL 4.00
GNU			U	1		< 0.00		mg/ Kg		2		4.00
									Spike	Percent	Rec	overy
Surrogate			Fl	ag Cert	Result	Units	Dil	ution	Amount	Recovery	Liı	mits
Trifluorotolu	ene (TFT))			3.52	mg/Kg	ŗ	2	4.00	88	70 -	- 130
4-Bromofluo	robenzene	(4-BFB)			3.51	mg/Kg	r S	2	4.00	88	70 -	- 130
Laboratory: Analysis:	Midland TPH DF 121451	RO - NEV	N		alytical M te Analyze		S 8015 2015-0			Prep Me Analyzeo		$_{ m N/A}$ SC
QC Batch: Prep Batch:	121451 102733				nple Prep		2015-0			Preparec	•	SC
riep Baten.	102100			500	iipie i rep	RL	2010 0	0 11		1 Toparoo	L Dy.	50
Parameter			Flag	Cert		Result		Units		Dilution		RL
DRO			Qs	1		2600		mg/Kg		4		50.0
			-									
Cumporate		Flag	Cont	\mathbf{D}_{agus}^{1+}	T Tara State		:1	-	oike	Percent		overy
Surrogate n-Tricosane		Flag	Cert	Result 332	Units mg/K		$\frac{1}{4}$		ount00	Recovery 332		mits - 130
n- 11100salle	Qsr	Qsr		002	mg/ N	5	4	1	00	004	10 -	100

Sample: 392601 - 13-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 121472 102750			Date An	al Methoo alyzed: Preparatio	2015-0	5-13		Prep Metho Analyzed B Prepared B	y: AK
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	1	$_{\rm Qs,U}$		1		<8.00	mg/k	Kg	2	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)		-		3.45	mg/Kg	2	4.00	86	70 - 130
4-Bromofluor	obenzene (4-BFB)				3.56	mg/Kg	2	4.00	89	70 - 130

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Sample: 392602 - 14-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	TPH DRO - NEW 121451		Date	lytical Metho e Analyzed: ple Preparati	2015-05	5-12	Prep Me Analyzeo Prepareo	•	
					I	RL			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{\rm Qs}$	1	76	30	m mg/Kg	10	50.0
a			C .		TT 1 .		Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		636	m mg/Kg	10	100	636	70 - 130

Sample: 392602 - 14-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121472Prep Batch:102750		Date An	al Method alyzed: Preparatio	2015-0	5-13		Prep Metho Analyzed B Prepared B	y: AK
				RL				
Parameter	Flag	Cert		Result	Uni	$^{ m ts}$	Dilution	RL
GRO ²	Qs,U	1		<8.00	mg/k	Kg	2	4.00
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	~		3.34	mg/Kg	2	4.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			3.40	mg/Kg	2	4.00	85	70 - 130

Sample: 392603 - 15-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEW 121451 102733	D	nalytical Method: ate Analyzed: .mple Preparation:	S 8015 D 2015-05-12 2015-05-11	Prep Method: Analyzed By: Prepared By:	\dot{SC}
			RL			
Parameter	Fl	ag Cert	Result	Units	Dilution	RL
DRO	Ç	s 1	27500	mg/Kg	20	50.0

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Surrogate Fla	g Cert	Result	Units	Dilu		Spike mount	Percent Recovery	Recovery Limits	
n-Tricosane Qsr Qsr	-	1920	mg/Kg	-	0 A	100	1920	70 - 130	
Sample: 392603 - 15-Veg									
Laboratory: Midland Analysis: TPH GRO QC Batch: 121472 Prep Batch: 102750		Date A	cal Method: nalyzed: Preparation	2015-0	5-13		Prep Metho Analyzed B Prepared B	y: AK	
				RL					
Parameter	Flag	Cert	F	Result	Uni	its	Dilution	RL	
GRO ³	$_{\rm Qs,U}$	1	~	<8.00	mg/I	Kg	2	4.00	
Surrogate	F	lag Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotoluene (TFT)	1	105 OCI U	3.46	mg/Kg	2	4.00	86	70 - 130	
4-Bromofluorobenzene (4-BF	B)		3.53	mg/Kg	2	4.00	88	70 - 130	

Sample: 392604 - 16-Veg

Laboratory:	Midland								
Analysis:	TPH DF	RO - NEV	V	Ana	lytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121451	Date Analyzed:				2015-05	5-12	Analyzeo	l By: SC
Prep Batch:	102733			Sample Preparation: 2015-05-11			Prepared	l By: SC	
					Ι	RL			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{\rm Qs}$	1	225	00	mg/Kg	20	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		1800	mg/Kg	20	100	1800	70 - 130

Sample: 392604 - 16-Veg

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	121472	Date Analyzed:	2015-05-13	Analyzed By:	AK
Prep Batch:	102750	Sample Preparation:	2015-05-12	Prepared By:	AK

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Parameter			Flam	Cont		RL Result	Uni	ta	Dilution	DI
GRO	4		Flag	Cert		$\frac{\text{Result}}{<8.00}$	mg/k		Dilution 2	RL 4.00
GIU			Qs,U	1		<0.00	mg/ r	хg	2	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene	(TFT)				3.23	mg/Kg	2	4.00	81	70 - 130
4-Bromofluorobe	nzene (4	4-BFB)			3.25	mg/Kg	2	4.00	81	70 - 130
Analysis: TH QC Batch: 12	idland	Veg) - NEV	V	Dat	dytical Me e Analyze pple Prepa	d: 20	8015 D 015-05-12 015-05-11		Prep Metho Analyzed E Prepared B	y: SC
Parameter			Flag	Cert	I	RL Result	Uni	ts	Dilution	RL
DRO			Qs	1		753	mg/K		2	50.0
								0		
~			~					Spike		Recovery
Surrogate		Flag	Cert	Result	Units			mount	Recovery	Limits
n-Tricosane	Qsr	Qsr		140	mg/Kg		2	100	140	70 - 130
Sample: 39260	5 - 17-	Veg								
Analysis: TF QC Batch: 12	idland PH GRC 1472 2750)		Date An	al Method alyzed: Preparatio	2015-0	5-13		Prep Method Analyzed By: Prepared By:	AK
Demonstern			D l	Cont		RL	II:	4-	Dilution	ы
Parameter GRO	5		Flag	Cert		Result <8.00	Uni mg/F		Dilution 2	RL 4.00
			Qs,U	1		<u>\0.00</u>	iiig/ r	` 5	2	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
	(9.49	/17	2	1.00	0.0	70 190
Trifluorotoluene 4-Bromofluorobe					3.42	m mg/Kg	2	4.00	86	70 - 130 70 - 130

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Sample: 39	2606 - 18-Veg							
Laboratory: Analysis: QC Batch: Prep Batch:	Analysis: TPH DRO - NEW QC Batch: 121451			lytical Metho e Analyzed: ple Preparat	2015-0	5-12	Prep Me Analyzec Preparec	d By: SC
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
DRO		$_{\rm Qs}$	1	16	20	m mg/Kg	2	50.0
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			126	m mg/Kg	2	100	126	70 - 130

Sample: 392606 - 18-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121472Prep Batch:102750		Date An	al Method: alyzed: Preparation	2015-0	5-13		Prep Metho Analyzed B Prepared B	y: AK
				RL				
Parameter	Flag	Cert	I	Result	Uni	ts	Dilution	RL
GRO ⁶	Qs,U	1		<8.00	mg/K	ζg	2	4.00
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	~		3.49	mg/Kg	2	4.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)			3.46	$\mathrm{mg/Kg}$	2	4.00	86	70 - 130

Sample: 392607 - 19-Veg

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NEW 121451 102733	- NEW		cal Method: aalyzed: Preparation:	S 8015 D 2015-05-12 2015-05-11	Prep Method: Analyzed By: Prepared By:	\dot{SC}
				RL			
Parameter]	Flag	Cert	Result	Units	Dilution	RL
DRO		Qs	1	333	mg/Kg	2	50.0

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Surrogate	Flag	Cert	R	esult	Units		tion .	Spike Amount	Percent Recovery	Recovery Limits	
n-Tricosane _{Qsr}	Qsr			212	m mg/Kg	2 2	2	100	212	70 - 130	
Sample: 392607 - 19-V	/eg										
Laboratory: Midland Analysis: TPH GRO QC Batch: 121472 Prep Batch: 102750			D	ate Ana	al Method: alyzed: Preparation	2015-0	5-13		Prep Metho Analyzed B Prepared B	y: AK	
						RL					
Parameter		Flag		Cert	F	Result	U	nits	Dilution	RL	
GRO 7		$_{\rm Qs,U}$		1	•	<8.00	mg/	Kg	2	4.00	
Surrogate		F	lag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
Trifluorotoluene (TFT)		-	0		6.74	mg/Kg	2	6.00	112	70 - 130	
4-Bromofluorobenzene (4-	BFB)				6.49	mg/Kg	2	6.00	108	70 - 130	

Sample: 392608 - 20-Veg

Laboratory:	Midland								
Analysis:	TPH DF	RO - NEV	V	Anal	lytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	121449		Date Analyzed:				5-12	Analyzed	d By: SC
Prep Batch:	102733			Sam	ple Preparati	on: 2015-05	5-11	Prepared	l By: SC
					Ι	RL			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	1	1	86	mg/Kg	2	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qsr		194	mg/Kg	2	100	194	70 - 130

Sample: 392608 - 20-Veg

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	121472	Date Analyzed:	2015-05-13	Analyzed By:	AK
Prep Batch:	102750	Sample Preparation:	2015-05-12	Prepared By:	AK

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						RL				
Parameter			Flag	Cert		Result	Un		Dilution	RL
GRO	8		$_{\rm Qs,U}$	1		<8.00	mg/l	Kg	2	4.00
								Spike	Percent	Recovery
Surrogate			Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotolue	ene (TFT)		0		3.54	mg/Kg	2	4.00	88	70 - 130
4-Bromofluor	obenzene ((4-BFB)			3.53	mg/Kg	2	4.00	88	70 - 130
Sample: 39 Laboratory: Analysis: QC Batch: Prep Batch:	2609 - 21 Midland TPH DR 121449 102733	-	V	Dat	dytical M e Analyze aple Prepa	ed: 2	8015 D 015-05-12 015-05-11		Prep Met Analyzed Prepared	By: SC
Parameter			Flag	Cert		RL Result	Un	its	Dilution	RL
DRO			Qr,Qs	1		326	mg/I	Кg	2	50.0
Surrogate		Flag	Cert	Result	Units	s Dilu		Spike .mount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		201	mg/K	g f	2	100	201	70 - 130
Sample: 39 Laboratory: Analysis: QC Batch: Prep Batch:	2609 - 21 Midland TPH GR 121502 102792	-		Date An	al Method alyzed: Preparatic	2015-0	5-14		Prep Metho Analyzed B Prepared B	y: AK
Parameter			Flag	Cert		RL Result	Un	ite	Dilution	RL
GRO	9		0			<8.00	Un mg/1		2	4.00
			$_{\rm Qs,U}$	1		\0.00	mg/1	•8	4	4.00

Surrogate Flag Cert Result Units Dilution Amount Rec		Spike Percent Recover
0		
$T_{\rm rifluorotoluono}$ (TET) 3.40 mg/Kg 2 4.00	te Flag Cert Result Units Dily	tion Amount Recovery Limits
3.49 mg/Kg = 2 4.00 mg/Kg	cotoluene (TFT) 3.49 mg/Kg	2 4.00 87 70 - 13
4-Bromofluorobenzene (4-BFB) 3.66 mg/Kg 2 4.00	ofluorobenzene (4-BFB) 3.66 mg/Kg	2 4.00 92 70 - 13

Report Date: May 14, 2015 7250715028	Work Order: 15050 1009 Relief Valve Re		Page Number: 22 of 37
Sample: 392610 - 22-VegLaboratory:MidlandAnalysis:TPH DRO - NEWQC Batch:121449Prep Batch:102733	Analytical Method: Date Analyzed: Sample Preparation:	S 8015 D 2015-05-12	Prep Method: N/A Analyzed By: SC Prepared By: SC

					F	RL			
Parameter			Flag	Cert	Resu	ılt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	1	12	10	mg/Kg	2	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		310	m mg/Kg	2	100	310	70 - 130

Sample: 392610 - 22-Veg

Laboratory:MidlandAnalysis:TPH GROQC Batch:121435Prep Batch:102727			Date An	al Method alyzed: Preparatic	2015-0	5-12		Prep Metho Analyzed B Prepared B	y: AK
					RL				
Parameter	Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	U		1		<8.00 mg/Kg		g	2	4.00
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1 145	0.010	3.65	mg/Kg	2	4.00	91	70 - 130
4-Bromofluorobenzene (4-BFB)				3.59	mg/Kg	2	4.00	90	70 - 130

Method Blanks

Method Blank (1)	QC Batch: 121435							
QC Batch: 121435 Prep Batch: 102727			nalyzed: eparation:	2015-05-1 2015-05-1			v	By: AK By: AK
					MDL			
Parameter	Flag		Cert		Result		Units	RL
GRO			1		<2.32		mg/Kg	4
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-	BFB)		1.90	$\mathrm{mg/Kg}$	1	2.00	95	70 - 130

Method Blank (1) QC Batch: 121445

QC Batch: Prep Batch:	$\frac{121445}{102720}$				Analyzed: reparation:	2015-05-12 2015-05-08			•	ed By: ed By:	
							MDL				
Parameter			Flag	S	Cert		Result		Units		RL
DRO					1		<7.41		m mg/Kg		50
Surrogate		Flag	Cert	Result	Units	Dilutio	-	pike nount	Percent Recovery		overy mits
n-Tricosane				107	mg/Kg	1	1	100	107	70 -	- 130

Method Blank (1) QC Batch: 121449

QC Batch:	121449		Date Analyzed:	2015-05-12	Analyzed By:	SC
Prep Batch:	102733		QC Preparation:	2015-05-11	Prepared By:	\mathbf{SC}
				MDL		
Parameter		Flag	Cert	Result	Units	RL
DRO			1	<7.41	mg/Kg	50

Report Date: May 14, 7250715028	, 2015			Vork Order: 09 Relief Va		e		Page Numb	per: 24 of 37
Surrogate	Flag	Cert	Result	Units	Dilut		Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			90.5	mg/Kg	1		100	90	70 - 130
Method Blank (1)	QC I	Batch: 12145	1						
QC Batch: 121451 Prep Batch: 102733				Analyzed: reparation:	2015-05-1 2015-05-1			Analyze Prepare	v
Parameter		Flag		Cert		MDL Result		Units	RL
DRO		1 1005		1		<7.41		mg/Kg	50
Surrogate	Flag	Cert	Result	Units	Dilut		Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	0		91.6	mg/Kg	1		100	92	70 - 130
Method Blank (1) QC Batch: 121472 Prep Batch: 102750	QC E	3atch: 12147	Date A	analyzed: eparation:	2015-05-1 2015-05-1			Analyzed Prepared	
D		Flag		Cert		MDL Result		Units	RL
Parameter		0		1		<2.32		m mg/Kg	4
							C . 1		_
Parameter GRO Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Method Blank (1)	QC Batch: 121502			
QC Batch: 121502	Date Analyzed:	2015-05-14	Analyzed By: Al	Κ
Prep Batch: 102792	QC Preparation:	2015-05-13	Prepared By: Al	Κ

Report Date: May 14, 2015 7250715028			Vork Orden 09 Relief V		Page Number: 25 of 37			
					MDL			
Parameter	Flag		Cert		Result		Units	RL
GRO			1		<2.32		m mg/Kg	4
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.90	mg/Kg	1	2.00	95	70 - 130
4-Bromofluorobenzene (4-BFB)			1.90	mg/Kg	1	2.00	95	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

Prep Batch: 102727				e Analy: Prepara		15-05-12 15-05-11				Analyzed Prepared	v
				LCS			Spike	N	latrix		Rec.
Param		\mathbf{F}	C	Result	Units	Dil.	Amoun	t R	lesult	Rec.	Limit
GRO			1	15.6	mg/Kg	g 1	20.0	<	<2.32	78	70 - 130
Percent recovery is based on the s	spike	resu	lt. RPD	is base	d on the s	pike and	spike duplie	cate res	sult.		
			LCSD			Spike	Matrix		Ree	с.	RPD
Param	\mathbf{F}	\mathbf{C}	Result	Unit		Amoun	t Result	Rec.	Lim		
GRO		1	15.4	mg/I	Kg 1	20.0	$<\!2.32$	77	70 - 1	130 1	20
Percent recovery is based on the s	spike	resu	lt. RPD	is base	d on the s	pike and	spike duplie	eate res	sult.		
			LC	CS I	LCSD		Sp	ike	LCS	LCSD	Rec.
Surrogate			Res		Result	Units		ount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)			1.8			ng/Kg		00	92	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.9	99	1.96 ı	ng/Kg	1 2.	00	100	98	70 - 130
Laboratory Control Spike (L	CS-1	.)									
QC Batch: 121445 Prep Batch: 102720		,		e Analy Prepara		15-05-12 15-05-08				Analyzed Prepared	v
•				v			Spike	N			v
•		F	QC	Prepara			Spike Amoun				By: SC
Prep Batch: 102720			QC	Prepara LCS	ation: 20	15-05-08 Dil.	-	t R	latrix	Prepared	By: SC Rec.
Prep Batch: 102720 Param	spike	F	QC C	Prepara LCS Result 218	ation: 20 Units mg/Ka	15-05-08 Dil. g 1	Amoun 250	t R	latrix tesult <7.41	Prepared Rec.	By: SC Rec. Limit
Prep Batch: 102720 Param DRO	spike	F	QC C	Prepara LCS Result 218	ation: 20 Units mg/Ka	15-05-08 Dil. g 1	Amoun 250	t R	latrix tesult <7.41	Prepared Rec. 87	By: SC Rec. Limit
Prep Batch: 102720 Param DRO	spike F	F	$\frac{C}{1}$	Prepara LCS Result 218	ation: 20 $\frac{\text{Units}}{\text{mg/K}_{1}}$ d on the s	$\begin{array}{c} \text{Dil.}\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	Amoun 250 spike duplic Matrix	t R	latrix tesult <7.41 sult.	Prepared Rec. 87 c.	By: SC Rec. Limit 70 - 130 RPD
Prep Batch: 102720 Param DRO Percent recovery is based on the s	-	F	QC <u>C</u> <u>1</u> It. RPD LCSD	Prepara LCS Result 218 is base	ation: 20 $\frac{\text{Units}}{\text{mg/Kg}}$ d on the s ts Dil.	$\begin{array}{c} \text{Dil.} \\ \hline \\ g \\ \hline \\ pike \text{ and} \\ \\ \text{Spike} \end{array}$	Amoun 250 spike duplic Matrix	t R < cate res	latrix tesult <7.41 sult. Rec	Prepared Rec. 87 c. nit RP	By: SC Rec. Limit 70 - 130 RPD D Limit
Prep Batch: 102720 Param DRO Percent recovery is based on the s Param	F	F resu C 1	QC <u>C</u> 1 lt. RPD LCSD Result 203	Prepara LCS Result 218 is base Unit mg/H	ation: 20 Units mg/K_{3} d on the s ts Dil. Kg = 1	Dil. <u>j</u> 1 pike and Spike Amoun 250	Amoun 250 spike duplid Matrix t Result <7.41	t R cate res Rec. 81	latrix tesult <7.41 sult. Rec Lim 70 - 1	Prepared Rec. 87 c. nit RP	By: SC Rec. Limit 70 - 130 RPD D Limit
Prep Batch: 102720 Param DRO Percent recovery is based on the s Param DRO	F	F resu <u>C</u> 1 resu	QC <u>C</u> 1 lt. RPD LCSD Result 203	Prepara LCS Result 218 is base Unit mg/H is base	ation: 20 Units mg/K_{3} d on the s ts Dil. Kg = 1	Dil. <u>j</u> 1 pike and Spike Amoun 250	Amoun 250 spike duplid Matrix t Result <7.41	t R cate res Rec. 81	latrix tesult c7.41 sult. Rec Lim 70 - 1 sult.	Prepared Rec. 87 c. nit RP	By: SC Rec. Limit 70 - 130 RPD D Limit
Prep Batch: 102720 Param DRO Percent recovery is based on the s Param DRO	F spike L(F resu <u>C</u> 1 resu	QC C 1 It. RPD LCSD Result 203 It. RPD	Prepara LCS Result 218 is based Unit mg/H is based D	ation: 20 Units mg/K_{3} d on the s ts Dil. Kg = 1	Dil. <u>j</u> 1 pike and Spike Amoun 250	Amoun 250 spike duplid Matrix t Result <7.41 spike duplid	t R cate res Rec. 81 cate res	Iatrix cesult <7.41 sult. Rec Lim 70 - 1 sult.	Rec. 87 c. hit RP 130 7	By: SC Rec. Limit 70 - 130 RPD D Limit 20

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Laboratory Control Spike (1	LCS-1)							
QC Batch: 121449 Prep Batch: 102733			v	15-05-12 15-05-11				vzed By: SC ared By: SC
Param	F		LCS esult Units	Dil.	Spike Amount	Mat Res		Rec. c. Limit
DRO			229 mg/Kg		250	<7.		
Percent recovery is based on the	e spike resu	ılt. RPD i	-, -		pike duplica	ate resul	t.	
Param	F C	LCSD Result	Units Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD RPD Limit
DRO	<u>r</u> U 1	220	mg/Kg = 1	250	<7.41		70 - 130	$\frac{1110}{4}$ $\frac{111110}{20}$
Percent recovery is based on the			0, 0					1 20
recent recovery is based on the	-		-	JIKE and S				
		I CGT			Spike	LCS	LCSI	
a	LCS	LCSE		D.11		D		
<u> </u>	LCS Result 110	Resul 107		Dil.	Amount 100	Rec. 110	Rec. 107	Limit 70 - 130
n-Tricosane	Result 110	Resul	t Units					
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451	Result 110	Result 107 Date	t Units mg/Kg Analyzed: 201				107 Analy	
Prep Batch: 102733	Result 110 LCS-1)	Result 107 Date QC F	t Units mg/Kg Analyzed: 201 Preparation: 201	1 15-05-12 15-05-11	100 Spike	110 Mat	107 Analy Prepa trix	70 - 130 vzed By: SC ared By: SC Rec.
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param	Result 110	Result 107 Date QC F C R	t Units mg/Kg Analyzed: 201 Preparation: 201 CCS esult Units	1 15-05-12 15-05-11 Dil.	100 Spike Amount	110 Mat Res	107 Analy Prepa trix pult Re	70 - 130 vzed By: SC ared By: SC Rec. c. Limit
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param DRO	Result 110 LCS-1) F	Result 107 Date QC F	t Units mg/Kg Analyzed: 201 Preparation: 201 LCS esult Units 232 mg/Kg	1 15-05-12 15-05-11 Dil. 1	100 Spike Amount 250	110 Mat Res <7.	107 Analy Prepa trix sult Re .41 95	70 - 130 vzed By: SC ared By: SC Rec. c. Limit
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param DRO	Result 110 LCS-1) F	$\frac{\text{Result}}{107}$ $\frac{\text{Date}}{\text{QC F}}$ $\frac{1}{\text{c}}$ $\frac{1}{\text{c}}$ $\frac{1}{\text{c}}$	t Units mg/Kg Analyzed: 201 Preparation: 201 LCS esult Units 232 mg/Kg	1 15-05-12 15-05-11 Dil. 1 Dike and sj	100 Spike Amount 250 pike duplica	110 Mat Res <7.	107Analy Prepatrix sultRe.4193t.	70 - 130 zed By: SC ared By: SC Rec. c. Limit 3 70 - 130
n-Tricosane Laboratory Control Spike (J QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on the	Result 110 LCS-1) F e spike resu	$\frac{\text{Result}}{107}$ $Date QC F$ $C R$ $\frac{1}{1}$ $LCSD$	t Units mg/Kg Analyzed: 201 Preparation: 201 LCS esult Units 232 mg/Kg s based on the sp	1 15-05-12 15-05-11 Dil. 1 Dike and sp Spike	100 Spike Amount 250 pike duplica Matrix	110 Mat Res <7. ate resul	Analy Prepa trix ault Re .41 93 t. Rec.	70 - 130 vzed By: SC ared By: SC Rec. c. Limit 3 70 - 130 RPD
n-Tricosane Laboratory Control Spike (J QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on the Param	Result 110 LCS-1) F e spike resu F C	Result 107 Date QC F I C R I LCSD Result	t Units mg/Kg Analyzed: 201 Preparation: 201 LCS esult Units 232 mg/Kg s based on the sp Units Dil.	1 15-05-12 15-05-11 Dil. 1 Dike and sj Spike Amount	100 Spike Amount 250 pike duplica Matrix Result	110 Mat Res <7. ate resul Rec.	Analy Prepa trix sult Re .41 93 t. Rec. Limit	70 - 130 72ed By: SC ared By: SC Rec. c. Limit 3 70 - 130 RPD RPD Limit
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on the Param DRO	Result 110 LCS-1) F e spike resu F C 1	Result 107 Date QC F I C R I It. RPD i LCSD Result 235	t Units mg/Kg Analyzed: 201 Preparation: 201 CCS esult Units 232 mg/Kg s based on the sp Units Dil. mg/Kg 1	1 25-05-12 25-05-11 Dil. 1 Dike and sj Spike Amount 250	100 Spike Amount 250 pike duplica Matrix Result <7.41	110 Mat Res <7. ate resul Rec. 94	Analy Prepa trix sult Re .41 95 t. Rec. Limit 70 - 130	70 - 130 vzed By: SC ared By: SC Rec. c. Limit 3 70 - 130 RPD
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on the Param DRO	Result 110 LCS-1) F e spike resu F C 1	Result 107 Date QC F I C R I It. RPD i LCSD Result 235	t Units mg/Kg Analyzed: 201 Preparation: 201 CCS esult Units 232 mg/Kg s based on the sp Units Dil. mg/Kg 1	1 25-05-12 25-05-11 Dil. 1 Dike and sj Spike Amount 250	100 Spike Amount 250 pike duplica Matrix Result <7.41	110 Mat Res <7. ate resul Rec. 94	Analy Prepa trix sult Re .41 95 t. Rec. Limit 70 - 130	70 - 130 72ed By: SC ared By: SC Rec. c. Limit 3 70 - 130 RPD RPD Limit
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on the Param DRO	Result 110 LCS-1) F e spike resu F C 1	Result 107 Date QC F I C R I It. RPD i LCSD Result 235	t Units mg/Kg Analyzed: 201 Preparation: 201 CCS esult Units 232 mg/Kg s based on the sp Units Dil. mg/Kg 1 s based on the sp	1 25-05-12 25-05-11 Dil. 1 Dike and sj Spike Amount 250	100 Spike Amount 250 pike duplica Matrix Result <7.41	110 Mat Res <7. ate resul Rec. 94	Analy Prepatrix sultKRec. Limit70 - 130 t.	70 - 130 /zed By: SC ured By: SC Rec. c. Limit <u>3 70 - 130</u> <u>RPD Limit</u> <u>1 20</u>
n-Tricosane Laboratory Control Spike (1 QC Batch: 121451	Result 110 LCS-1) F e spike resu F C 1 e spike resu	Result 107 Date QC F I C R I It. RPD i LCSD Result 235 It. RPD i	t Units mg/Kg Analyzed: 201 Preparation: 201 CCS esult Units 232 mg/Kg s based on the sp Units Dil. mg/Kg 1 s based on the sp	1 25-05-12 25-05-11 Dil. 1 Dike and sj Spike Amount 250	100 Spike Amount 250 pike duplica Matrix Result <7.41 pike duplica	$\frac{110}{Mat}$ $\frac{Res}{<7.}$ ate resul $\frac{Rec.}{94}$ ate resul	Analy Prepatrix sultKRec. Limit70 - 130 t.	70 - 130 // // // // // // // // // // // // //

QC Batch:	121472	Date Analyzed:	2015-05-13	Analyzed By:	AK
Prep Batch:	102750	QC Preparation:	2015-05-12	Prepared By:	AK

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				LCS				Spike		latrix		Rec.
Param		F	С	Result				Amount		esult	Rec.	Limit
GRO			1	16.6	mg	/Kg 1	1	20.0	<	(2.32	83	70 - 130
Percent recovery is based on the sp	pike	resu	t. RPD) is bas	sed on th	ne spike ar	ıd spik	e duplica	te res	ult.		
			LCSD	,		Spil	ke	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result		nits D	Dil. Amo			Rec.	Limit		
GRO		1	15.8			1 20.		<2.32	79	70 - 13		
Percent recovery is based on the sp	pike	resu	t. RPD			he spike ar	nd spik	e duplica	te res	ult.		
	P	÷					100 °T	-			- 200	7
0				CS	LCSD	тт •,	וית	Spik			LCSD	$\operatorname{Rec.}$
Surrogate				sult	Result	Units	Dil.			Rec.	Rec.	Limit
Trifluorotoluene (TFT)				92	1.82	mg/Kg	1	2.00		96 102	91 06	70 - 130 70 - 120
4-Bromofluorobenzene (4-BFB)			2.	.05	1.93	mg/Kg	1	2.00	<u>)</u>	102	96	70 - 130
Laboratory Control Spike (LC	28-1)										
QC Batch: 121502	78-1)		e Anal Prepa	lyzed: aration:	2015-05-1 2015-05-1					nalyzed repared	
QC Batch: 121502	CS-1	.)			•			Spike	М		•	
QC Batch: 121502 Prep Batch: 102792 Param		.) F	QC	Prepa LCS Result	t Ur	2015-05-1 nits D	.3 il.	Amount	R	Pr latrix esult	repared Rec.	By: AK Rec. Limit
QC Batch: 121502 Prep Batch: 102792 Param			QC	Prepa LCS	t Ur	2015-05-1 nits D	3	-	R	Pı Iatrix	repared	By: AK Rec.
QC Batch: 121502 Prep Batch: 102792		F	QC C	Prepa LCS Result 14.5	t Ur mg	2015-05-1 nits D /Kg	.3 il. 1	Amount 20.0	R <	Pr latrix cesult (2.32	repared Rec.	By: AK Rec. Limit
QC Batch: 121502 Prep Batch: 102792 Param GRO		F	$\frac{C}{1}$	Prepa LCS Result 14.5	t Ur mg	$\begin{array}{c c} 2015-05-1\\ \hline \\ \hline$.3 il. 1 nd spik	Amount 20.0 e duplica	R <	Patrix esult 2.32 sult.	Rec.	By: AK Rec. Limit 70 - 130
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp	pike	F	QC <u>C</u> 1 It. RPD LCSD	Prepa LCS Result 14.5	$\frac{t \qquad Ur}{mg}$ sed on th	$\begin{array}{c c} 2015-05-1 \\ \hline \\ \\ \hline \\ \\ \hline \\$.3 il. 1 nd spik ke	Amount 20.0 e duplica Matrix	R < te res	Pi latrix <u>esult</u> (2.32 sult. Rec.	Rec.	By: AK Rec. Limit 70 - 130 RPD
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param		F	QC <u>C</u> 1 It. RPD LCSD Result	Prepa LCS Result 14.5) is bas	t Ur mg sed on th nits D	2015-05-1 nits D /Kg f he spike ar Spil Dil. Amo	3 il. I nd spik ke	Amount 20.0 e duplica Matrix Result	R te res Rec.	Pr latrix esult (2.32 sult. Rec. Limit	Rec. 72 t RF	By: AK Rec. Limit 70 - 130 RPD PD Limit
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param GRO	pike F	F resul C 1	QC <u>C</u> <u>1</u> lt. RPD LCSD Result 15.2	Prepa LCS Result 14.5) is bas Ur mg	t Ur mg sed on th nits D	2015-05-1 mits D /Kg f he spike ar Spil Dil. Amo 1 20.	3 il. I nd spik ke U unt 0	Amount 20.0 e duplica Matrix Result <2.32	R .te res Rec. 76	Pa latrix cesult c2.32 sult. Rec. Limit 70 - 1;	Rec. 72 t RF	By: AK Rec. Limit 70 - 130 RPD PD Limit
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param	pike F	F resul C 1	QC <u>c</u> <u>1</u> lt. RPD LCSD Result <u>15.2</u> lt. RPD	Prepa LCS Result 14.5) is bas Ur mg,) is bas	t Ur mg sed on th nits D s/Kg sed on th	2015-05-1 mits D /Kg f he spike ar Spil Dil. Amo 1 20.	3 il. I nd spik ke U unt 0	Amount 20.0 e duplica Matrix Result <2.32 e duplica	R <te res<br="">Rec. 76 tte res</te>	Parameter $Parameter Parameter Para$	$\frac{\text{Rec.}}{72}$ t RF 30 5	By: AK Rec. Limit 70 - 130 RPD D Limit 5 20
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param GRO Percent recovery is based on the sp	pike F	F resul C 1	QC <u>c</u> <u>1</u> It. RPD <u>LCSD</u> <u>Result</u> <u>15.2</u> It. RPD <u>L0</u>	Prepa LCS Result 14.5) is bas () un mg,) is bas CS	$\frac{t \qquad Ur}{mg}$ sed on the sed o	2015-05-1 mits D /Kg f he spike ar Spil Dil. Amo 1 20. he spike ar	3 il. Id spik ke 1 unt 2 0 nd spik	Amount 20.0 e duplica Matrix Result <2.32 e duplica Spik	R te res Rec. 76 te res xe	Pa latrix esult 2.32 sult. Rec. Limit 70 - 13 sult. LCS	$\frac{\text{Rec.}}{72}$ $\frac{\text{t}}{1000} \text{RF}$ $\frac{1000}{1000} \text{LCSD}$	By: AK Rec. Limit 70 - 130 RPD Limit 5 20 Rec.
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param GRO Percent recovery is based on the sp Surrogate	pike F	F resul C 1	QC 1 It. RPD LCSD Result 15.2 It. RPD LC Res	Prepa LCS Result 14.5) is bas Ur mg,) is bas CS sult	t Ur mg sed on th nits D ;/Kg sed on th LCSD Result	$2015-05-1$ $\frac{1}{/\mathrm{Kg}}$ $\frac{1}{/\mathrm{Kg}}$ $\frac{1}{20.}$ $\frac{1}{20.}$ $\frac{1}{20.}$ $\frac{1}{20.}$ $\frac{1}{20.}$.3 I nd spik ke I unt 0 nd spik Dil.	Amount 20.0 e duplica Matrix Result <2.32 e duplica Spik Amou	R te res Rec. 76 te res ce unt	Property of the second	Rec. 72 t RF 30 5 LCSD Rec.	By: AK Rec. Limit 70 - 130 PD Limit 5 20 Rec. Limit
QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the sp Param GRO Percent recovery is based on the sp	pike F	F resul C 1	QC 1 LCSD Result 15.2 It. RPD LCSD Result 15.2 It. RPD	Prepa LCS Result 14.5) is bas () un mg,) is bas CS	$\frac{t \qquad Ur}{mg}$ sed on the sed o	2015-05-1 mits D /Kg f he spike ar Spil Dil. Amo 1 20. he spike ar	3 il. Id spik ke 1 unt 2 0 nd spik	Amount 20.0 e duplica Matrix Result <2.32 e duplica Spik	R cte res Rec. 76 te res ce unt 0	Pa latrix esult 2.32 sult. Rec. Limit 70 - 13 sult. LCS	$\frac{\text{Rec.}}{72}$ $\frac{\text{t}}{1000} \text{RF}$ $\frac{1000}{1000} \text{LCSD}$	By: AK Rec. Limit 70 - 130 RPD Limit 5 20 Rec.

Matrix Spikes

Matrix Spike (MS-1)	Spiked Samp	le: 392610								
QC Batch: 121435		Dat	e Analyzed	l: 201	5-05-12			Anal	yzed B	y: AK
Prep Batch: 102727			Preparatic		5-05-11				ared B	
			MS			Spike	Μa	atrix		Rec.
Param	F	С	Result	Units	Dil.	Amount	Re		lec.	Limit
GRO		1	35.3	$\mathrm{mg/Kg}$	2	40.0	<4	4.64	88	70 - 130
Percent recovery is based on	the spike re	sult. RPD	is based o	n the sp	oike and s	pike duplica	te resu	ılt.		
		MSD			Spike	Matrix		Rec.		RPD
Param	F (Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	:	36.0	mg/Kg	2	40.0	<4.64	90	70 - 130	2	20
Percent recovery is based on	the spike re	sult. RPD	is based o	n the sp	oike and s	pike duplica	te resu	ılt.		
		٦	IS MS	CD.		Spi	iko	MS N	1SD	Rec.
Surrogate			sult Res		Units	Dil. Amo			Rec.	Limit
Trifluorotoluene (TFT)			$\frac{63}{63}$ 3.5		ng/Kg	$\frac{2}{2}$			90	70 - 130
4-Bromofluorobenzene (4-BF	B)		00 3.8		ng/Kg	2 4	L			70 - 130
Matrix Spike (xMS-1) QC Batch: 121445 Prep Batch: 102720	Spiked Sam	Dat	2 e Analyzec Preparatio		15-05-12 15-05-08				lyzed E pared B	v
			MS			Spike	Ma	atrix		Rec.
Param	F	C	Result	Units	Dil.	Amount			lec.	Limit
DRO	Qs Q	s 1	2290	mg/Kg	g 1	250	1	920 1	.48	70 - 130
Percent recovery is based on	the spike re	sult. RPD	is based o	n the sp	oike and s	pike duplica	te resu	ılt.		
		MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	C Resul		Dil.	Amount		Rec.	Limit	RPD	Limit
DRO	Qs Qs	1 2280	mg/Kg		250	1920	144	70 - 130	0	20
Percent recovery is based on	the spike re	sult. RPD			oike and s	pike duplica	te resu	ılt.		
	Ν		ISD			Spike	М	IS MS	סי	Rec.
Surrogate	Re			Units	Dil.	Amount	Re			Rec. Limit
n-Tricosane _{Qsr} _{Qsr}	19			ng/Kg	1	100	19			70 - 130
				5, 0			-	-		

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Matrix Spike (MS-1)	Spiked Sam	ple: 39	2592							
QC Batch: 121449 Prep Batch: 102733			Date Ana QC Prepa		5-05-12 5-05-11			v	vzed By: ared By:	
			М			Spike	Mat	trix		Rec.
Param		F	C Res		Dil.	Amount				Limit
DRO	$10_{\rm Qs}$	$_{\rm Qs}$	1 14	00 mg/Kg	g 2	250	34	40 42	24 70) - 130
Percent recovery is based on	the spike r	esult. I	RPD is ba	sed on the spi	ke and spil	ke duplica	te result	t.		
_		- ~	MSD		Spike	Matrix	_	Rec.		RPD
Param]		Result	Units Dil.	Amount		Rec.	Limit		Limit
DRO		,Qs 1		mg/Kg 2	250	340	296	70 - 130	26	20
Percent recovery is based on	the spike r	esult.	RPD is ba	sed on the spi	ke and spil	ke duplica	te result	t.		
	ז	MS	MSD			Spike	MS	MSI)]	Rec.
	1				Dil.	Amount	Rec	. Rec.	T	Limit
Surrogate		esult	Result	Units	DII.	Amount	Itte			3111110
n-Tricosane _{Qsr Qsr}	2	8.7	275	Units mg/Kg	2	100	29	275		
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451	Re	8.7	275	mg/Kg alyzed: 201				275 Analy) - 130 SC
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451	2	8.7	275 392592 Date Ana	mg/Kg alyzed: 201	2			275 Analy	70 vzed By:) - 130 SC
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451	2	8.7	275 392592 Date Ana	mg/Kg alyzed: 2013 aration: 2013	2			275 Analy Prepa	70 vzed By: ured By:) - 130 SC
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param	Ra 2 Spiked Sar	8.7 nple: 3	275 392592 Date Ana QC Prepa MS C Resu	mg/Kg alyzed: 2013 aration: 2013 lt Units	2 5-05-12 5-05-11 Dil.	100 Spike Amount	29 Mat Rest	275 Analy Prepa rix ult Re	70 vzed By: ured By: c. I	SC SC Rec. Limit
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param	Ra 2 Spiked Sar	8.7 nple: 3 F (275 392592 Date Ana QC Prepa MS	mg/Kg alyzed: 2013 aration: 2013 lt Units	2 5-05-12 5-05-11	100 Spike	29 Mat	275 Analy Prepa rix ult Re	70 vzed By: ured By: c. I	SC SC Rec. Limit
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO	Ra 2 Spiked Sar	8.7 nple: 3 F (275 392592 Date Ana QC Prepa MS <u>C Resu</u> 1 1080	mg/Kg alyzed: 2014 aration: 2014 lt Units 0 mg/Kg	2 5-05-12 5-05-11 Dil. 2	100 Spike Amount 250	29 Mat Ress 31	275 Analy Prepa ult Re- 3 30	70 vzed By: ured By: c. I	SC SC Rec. Limit
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on	Ra 2 Spiked San Qs the spike r	8.7 nple: 3 F (Qs : esult. 1	275 392592 Date Ana QC Prepa MS <u>C Resu</u> 1 1080 RPD is ba MSD	mg/Kg alyzed: 2014 aration: 2014 lt Units 0 mg/Kg	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike	100 Spike Amount 250 ke duplica Matrix	29 Mat Rest 31 te result	275 Analy Prepa rix ult Re 3 30 t. Rec.	70 vzed By: ared By: c. I 7 70	SC SC SC Limit - 130 RPD
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on Param	Ra 2 Spiked Sar	8.7 nple: 3 F (_{2s} esult. 1 C F	275 392592 Date Ana QC Prepa MS <u>1 1080</u> RPD is ba MSD Result U	mg/Kg alyzed: 2013 aration: 2013 <u>lt Units</u> <u>) mg/Kg</u> sed on the spi Units Dil.	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike Amount	100 Spike Amount 250 ke duplica Matrix Result	29 Mat Rest 31: te result Rec.	275 Analy Prepa arix <u>ult Re</u> <u>3 30</u> t. Rec. Limit	70 vzed By: ured By: c. I) - 130 SC SC Limit) - 130 RPD Limit
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on Param	Ra 2 Spiked San Qs the spike r	8.7 nple: 3 F (_{2s} esult. 1 C F	275 392592 Date Ana QC Prepa MS <u>1 1080</u> RPD is ba MSD Result U	mg/Kg alyzed: 2013 aration: 2013 lt Units) mg/Kg sed on the spi	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike	100 Spike Amount 250 ke duplica Matrix	29 Mat Rest 31: te result Rec.	275 Analy Prepa rix ult Re 3 30 t. Rec.	70 vzed By: ared By: c. I 7 70) - 130 SC SC Limit) - 130 RPD
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on Param DRO	Ra 2 2 Spiked San vertices the spike r F Qs Qs	$\frac{8.7}{\text{mple: 3}}$	275 B92592 Date Ana QC Prepa MS C Resu 1 1080 RPD is ba MSD Result U 1090 mg	mg/Kg alyzed: 2013 aration: 2013 lt Units <u>) mg/Kg</u> sed on the spi Units Dil. g/Kg 2	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike Amount 250	100 Spike Amount 250 ke duplica Matrix Result 313	29 Mat Ress 31: te result Rec. 311	275 Analy Prepa orix ult Rev 3 30 t. Rec. Limit 70 - 130	70 vzed By: ured By: c. I 7 70 RPD) - 130 SC SC Limit) - 130 RPD Limit
n-Tricosane _{Qsr Qsr} Matrix Spike (xMS-1) QC Batch: 121451 Prep Batch: 102733 Param DRO Percent recovery is based on Param DRO	$\frac{R}{2}$ Spiked San $\frac{Q_{S}}{T}$ the spike r $\frac{F}{Q_{S}}$ the spike r	$\frac{8.7}{\text{mple: 3}}$	275 B92592 Date Ana QC Prepa MS C Resu 1 1080 RPD is ba MSD Result U 1090 mg	mg/Kg alyzed: 2013 aration: 2013 lt Units <u>) mg/Kg</u> sed on the spi Units Dil. g/Kg 2	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike Amount 250	100 Spike Amount 250 ke duplica Matrix Result 313 ke duplica	29 Mat Ress 31: te result Rec. 311	$\begin{array}{r} 275\\ \text{Analy}\\ \text{Prepa}\\ \end{array}$	70 vzed By: ured By: <u>c. I</u> 7 70 <u>RPD</u> 1) - 130 SC SC Limit) - 130 RPD Limit
Matrix Spike (xMS-1) QC Batch: 121451	Spiked San Q_{S} the spike r Q_{S} Qs the spike r	$\frac{8.7}{F}$ $\frac{F}{C}$ $\frac{1}{F}$ $\frac{1}{F}$	275 B92592 Date Ana QC Prepa MS C Resu 1 1080 RPD is ba MSD Result U 1090 mg RPD is ba	mg/Kg alyzed: 2013 aration: 2013 lt Units <u>) mg/Kg</u> sed on the spi Units Dil. g/Kg 2	2 5-05-12 5-05-11 Dil. 2 ke and spil Spike Amount 250	100 Spike Amount 250 ke duplica Matrix Result 313	29 Mat Ress 31: te result <u>Rec.</u> 311 ' te result	$\begin{array}{c} 275\\ Analy\\ Prepa\\ \\ rix\\ ult \\ Rec.\\ \\ Limit\\ \hline 70 - 130\\ \\ t.\\ \\ \\ S \\ MSI \end{array}$	70 vzed By: ared By: c. I 7 70 RPD 1	SC SC SC Limit 0 - 130 RPD Limit 20

Matrix Spike (MIS-1) Spiked Sample: 392949	Matrix Spike (MS-1)	Spiked Sample: 392949
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QC Batch:	121472	Date Analyzed:	2015-05-13	Analyzed By:	AK
Prep Batch:	102750	QC Preparation:	2015-05-12	Prepared By:	AK

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				MS			Spik		latrix		Rec.
Param		F	С	Result	Units	Dil.	Amou		lesult	Rec.	Limit
GRO	$_{\rm Qs}$	$_{\rm Qs}$	1	516	mg/Kg	g 5	100)	560	-44	70 - 130
Percent recovery is based on the s	spike	result	t. RPD	is base	d on the sp	oike and sp	pike dup	licate res	sult.		
			MSD			Spike	Matri	x	Rec		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Uni	ts Dil.	Amount			Lim	it RP	D Limit
GRO Qs	$_{\rm Qs}$	1	619	mg/	Kg 5	100	560	59	70 - 1	130 18	8 20
Percent recovery is based on the s	spike	result	t. RPD	is base	d on the sp	oike and sp	pike dup	licate res	sult.		
				MS	MSD			Spike	MS	MSD	Rec.
Surrogate				Result	Result	Units		Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)				7.86	8.88	mg/Kg	5	10	79	89	70 - 130
$AD \qquad (1) \qquad (ADED)$	Qsr	Qsr		33.7	43.6	$\mathrm{mg/Kg}$	5	10	337	436	70 - 130
	d Sar	nple:	393011		1 001						
	d Sar	nple:	Date	e Analy: Prepara		5-05-14 5-05-13				analyzed Prepared	v
Matrix Spike (MS-1) Spike QC Batch: 121502	d Sar	nple:	Date	v			Spik	te N			v
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param	d Sar	nple: F	Date QC	Prepara MS Result	tion: 201 Units	5-05-13 Dil.	Amou	int R	P Iatrix Result	Prepared Rec.	By: AK Rec. Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param	d Sar	-	Date QC	Prepara MS	tion: 201	5-05-13 Dil.	-	int R	P latrix	Prepared	By: AK Rec.
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param	Qs	F	Date QC	Prepara MS <u>Result</u> 11.4	tion: 201 Units $\frac{\text{Units}}{\text{mg/Kg}}$	5-05-13 Dil. g 1	Amou 20.0	int R	P Iatrix Result <2.32	Prepared Rec.	By: AK Rec. Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO	Qs	F	Date QC	Prepara MS <u>Result</u> 11.4	tion: 201 Units $\frac{\text{Units}}{\text{mg/Kg}}$	5-05-13 Dil. g 1	Amou 20.0	int R) < licate res	P Iatrix Result <2.32	Prepared Rec. 57	By: AK Rec. Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the s Param	Qs	F	Date QC 1 t. RPD MSD Result	Prepara MS Result 11.4 is based Uni	tion: 201 Units mg/K_{ξ} d on the sp ts Dil.	$5-05-13$ $\frac{\text{Dil.}}{\text{g}}$ $\frac{1}{\text{pike and sp}}$	Amou 20.0 pike dup Matri Resul	int R) < licate res x t Rec.	P Iatrix tesult <2.32 sult.	Rec. 57	By: AK Rec. Limit 70 - 130 RPD
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO Spike Percent recovery is based on the spike	₂₅ spike F	F Q₅ result	$\frac{\text{Date}}{\text{QC}}$ $\frac{1}{1}$ t. RPD MSD	Prepara MS Result 11.4 is based	tion: 201 Units mg/K_{ξ} d on the sp ts Dil.	5-05-13 Dil. g 1 Dike and sp Spike	Amou 20.0 pike dup Matri	int R) < licate res x t Rec.	P Iatrix Result <2.32 sult. Rec	Prepared Rec. 57 :. it RP	By: AK Rec. Limit 70 - 130 RPD D Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO Percent recovery is based on the s Param	$\frac{Q_{S}}{Q_{S}}$ spike	F Qs result C 1	Date QC 1 t. RPD MSD Result 12.8	Prepara MS Result 11.4 is base Uni mg/	tion: 201 Units mg/Kg d on the sp ts Dil. Kg 1	5-05-13 Dil. g 1 Dike and sp Spike Amount 20.0	Amou 20.0 pike dup Matri Resul <2.32	int R 0 <	P latrix cesult < 2.32 sult. Rec Lim 70 - 1	Prepared Rec. 57 :. it RP	By: AK Rec. Limit 70 - 130 RPD D Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO GRO O Param GRO GRO O Param O GRO O Param O GRO O O O <	$\frac{Q_{S}}{Q_{S}}$ spike	F Qs result C 1	Date QC 1 t. RPD MSD Result 12.8	Prepara MS Result 11.4 is based Uni mg/ is based	tion: 201 Units mg/Kg d on the sp ts Dil. Kg 1	5-05-13 Dil. g 1 Dike and sp Spike Amount 20.0	Amou 20.0 pike dup Matri Resul <2.32 pike dup	int R 0 <	P latrix cesult < 2.32 sult. Rec Lim 70 - 1	Prepared Rec. 57 :. it RP	By: AK Rec. Limit 70 - 130 RPD D Limit
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO GRO Qs Param GRO Percent recovery is based on the s Param GRO Surrogate Qs	$\frac{Q_{S}}{Q_{S}}$ spike	F Qs result C 1	Date QC 1 t. RPD MSD Result 12.8 t. RPD	$\begin{array}{c} \text{Prepara}\\ \text{MS}\\ \hline \text{Result}\\ \hline 11.4\\ \text{is base}\\ \hline \\ \hline \\ \text{mg/}\\ \hline \\ \text{is base}\\ \hline \\ \hline \\ \\ \text{S}\\ \end{array}$	tion: 201 Units mg/Kg d on the sp ts Dil. Kg 1 d on the sp MSD	5-05-13 Dil. g 1 Dike and sp Spike Amount 20.0 Dike and sp	Amou 20.0 pike dup Matri Resul <2.32 pike dup	$\begin{array}{c c} \text{mt} & \text{R}\\ \hline \\ \hline \\ \hline \\ \hline \\ \\ \text{licate res}\\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \\ \hline \\ \hline \\ \hline \\$	P latrix cesult <2.32 sult. Rec Lim 70 - 1 sult.	Prepared Rec. 57 : : : : : : : : : : : : : : : : : :	By: AK Rec. Limit 70 - 130 RPD D Limit 2 20
Matrix Spike (MS-1) Spike QC Batch: 121502 Prep Batch: 102792 Param GRO GRO Q Param Q Percent recovery is based on the set Param Q Param Q QRO Qs Percent recovery is based on the set	$\frac{Q_{S}}{Q_{S}}$ spike	F Qs result C 1	Date QC 1 t. RPD MSD Result 12.8 t. RPD M	$\begin{array}{c} \text{Prepara}\\ \text{MS}\\ \hline \text{Result}\\ 11.4\\ \text{is base}\\ \hline \\ \hline \\ \text{is base}\\ \hline \\ \hline \\ \\ \hline \\ \\ \text{is base}\\ \hline \\ \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	tion: 201 Units mg/Kg d on the sp ts Dil. Kg 1 d on the sp MSD Result 1.74 r	5-05-13 Dil. g 1 Dike and sp Spike Amount 20.0 Dike and sp	Amou 20.0 pike dup Matri Resul <2.32 pike dup	mt R) < licate res x t Rec. 2 64 licate res Spike	P fatrix cesult c2.32 sult. Rec Lim 70 - 1 sult. MS	Rec. 57 :. it RP 130 12 MSD	By: AK Rec. Limit 70 - 130 RPD D Limit 2 20 Rec.

Calibration Standards

Standard (CCV-1)

QC Batch:	121435	Date Analyzed			2015-05-12		Analy	zed By: AK
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.904	90	80 - 120	2015-05-12

Standard (CCV-2)

QC Batch:	121435	Date An			2015-05-12		Analyzed By: AK		
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
GRO		1	mg/Kg	1.00	0.835	84	80 - 120	2015-05-12	

Standard (CCV-3)

QC Batch:	121435	Date Analyzed:			2015-05-12		Analyzed By: AK		
				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	0.995	100	80 - 120	2015-05-12	

Standard (CCV-2)

QC Batch:	121445	21445 Date Analyzed: 2015-05-12					Analy	zed By: SC
				CCVs True	CCVs Found	CCVs Percent	Percent	Date
				rrue	round	rercent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	m mg/Kg	250	228	91	80 - 120	2015-05-12

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Standard (C	CV-3)								
QC Batch: 12	21445		Date	Analyzed:	2015-05-12		Analy	zed By: SC	
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
DRO	Tag	1	mg/Kg	250	213	85	80 - 120	2015-05-12	
Standard (C	CV-1)								
QC Batch: 12	21449		Date	Analyzed:	2015-05-12		Analy	zed By: SC	
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent	Percent Recovery Limits	Date Analyzed	
DRO	Flag		mg/Kg	250	220	Recovery 88	80 - 120	2015-05-12	
Standard (C QC Batch: 1:	,		Date	Analyzed: CCVs	2015-05-12 CCVs	CCVs	Percent	vzed By: SC	
	Flag	Cert	Units	True Conc.	Found Conc.	Percent Recovery	Recovery Limits	Date Analyzed	
Param	1 1005	0010		00110.	cono.				
	0	1	mg/Kg	250	227	91	80 - 120	2015-05-12	
Param DRO Standard (C QC Batch: 1:	CV-3)	1		250 Analyzed:	227 2015-05-12	91			
DRO Standard (C	CV-3)	1		Analyzed: CCVs	2015-05-12 CCVs	$\rm CCVs$	Analy Percent	vzed By: SC	
DRO Standard (C	CV-3)	ı		Analyzed:	2015-05-12		Analy	2015-05-13 vzed By: SC Date Analyzed	

Standard (CCV-1)

QC Batch: 121451

Date Analyzed: 2015-05-12

Analyzed By: SC

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	m mg/Kg	250	218	87	80 - 120	2015-05-12
Standard (C	CV-2)							
QC Batch: 12	21451		Date	Analyzed:	2015-05-12		Analy	vzed By: SC
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent	Percent Recovery Limits	Date
Param	гıag	Cert			236	Recovery 94	80 - 120	Analyzed 2015-05-12
DRO		1	mg/Kg	250	200		00 - 120	
DRO Standard (C) QC Batch: 12	,	1			2015-05-12			vzed By: SC
Standard (C	,	1		Analyzed: CCVs	2015-05-12 CCVs	$\rm CCVs$	Analy Percent	vzed By: SC
Standard (C) QC Batch: 12	21451		Date	- Analyzed: CCVs True	2015-05-12 CCVs Found	CCVs Percent	Analy Percent Recovery	vzed By: SC Date
Standard (C) QC Batch: 12 Param	,	ı Cert		Analyzed: CCVs	2015-05-12 CCVs	$\rm CCVs$	Analy Percent	vzed By: SC
Standard (C) QC Batch: 12 Param DRO Standard (C)	21451 Flag CV-2)	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 250	2015-05-12 CCVs Found Conc. 219	CCVs Percent Recovery	Analy Percent Recovery Limits 80 - 120	vzed By: SC Date Analyzed 2015-05-12
Standard (C) QC Batch: 12 Param DRO	21451 Flag CV-2)	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 250	2015-05-12 CCVs Found Conc.	CCVs Percent Recovery	Analy Percent Recovery Limits 80 - 120	vzed By: SC Date Analyzed
Standard (C) QC Batch: 12 Param DRO Standard (C)	21451 Flag CV-2)	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 250 Analyzed: CCVs	2015-05-12 CCVs Found Conc. 219 2015-05-13 CCVs	CCVs Percent Recovery 88	Analy Percent Recovery Limits 80 - 120 Analy Percent	zed By: SC Date Analyzed 2015-05-12 zed By: AK
Standard (C) QC Batch: 12 Param DRO Standard (C)	21451 Flag CV-2)	Cert	Date Units mg/Kg	Analyzed: CCVs True Conc. 250 Analyzed:	2015-05-12 CCVs Found Conc. 219 2015-05-13	CCVs Percent Recovery 88	Analy Percent Recovery Limits 80 - 120 Analy	vzed By: SC Date Analyzed 2015-05-12

Standard (CCV-3)

QC Batch: 121472

Date Analyzed: 2015-05-13

Analyzed By: AK

Report Date: 7250715028	May 14, 2015	5	Work Order: 15050631 1009 Relief Valve Release				Page Number: 35 o		
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
GRO		1	m mg/Kg	1.00	0.805	80	80 - 120	2015-05-13	
Standard (C	CV-1)								
QC Batch: 1	21502		Date	Analyzed:	2015-05-14		Analy	zed By: AK	
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
GRO		1	mg/Kg	1.00	0.913	91	80 - 120	2015-05-14	
Standard (C	CCV-2)								
QC Batch: 1	21502		Date	Analyzed:	2015-05-14		Analy	zed By: AK	
D		C i	T T 1 ,	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	

Conc.

1.00

Conc.

0.904

Recovery

90

Limits

80 - 120

Analyzed

2015-05-14

 $\frac{\text{Param}}{\text{GRO}}$

 Cert

1

Flag

Units

 $\mathrm{mg/Kg}$

Appendix

Report Definitions

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

Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-14-8	Midland

Standard Flags

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

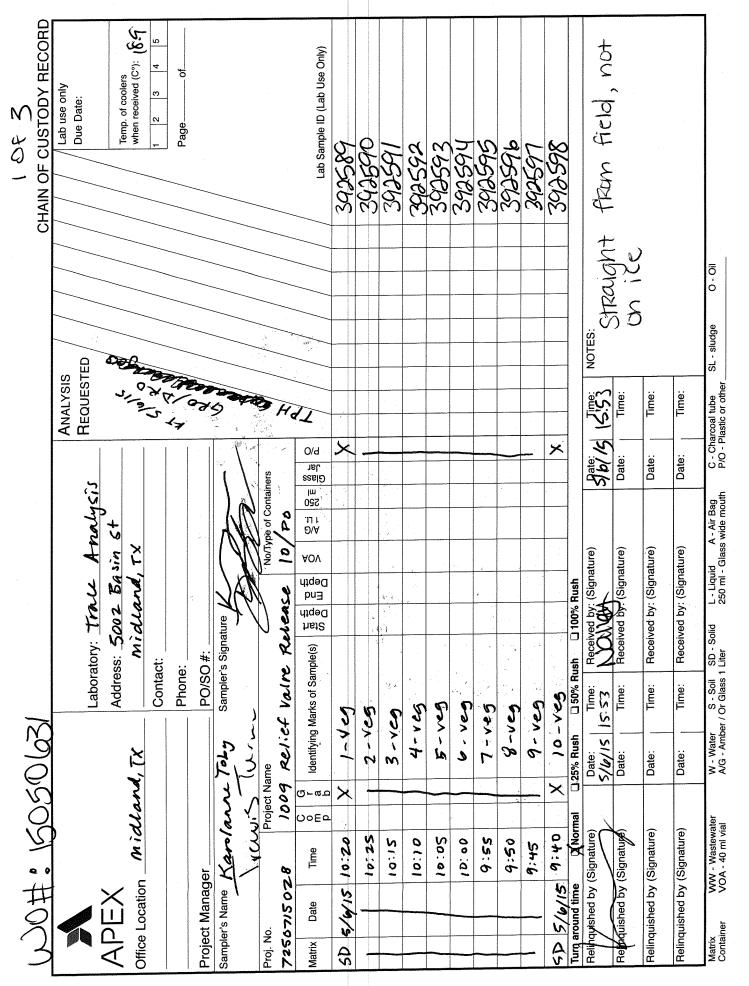
Result Comments

Work Order: 15050631 1009 Relief Valve Release Page Number: 37 of 37

- 1 Dilution due to matrix difficulties.
- 2 Dilution due to matrix difficulties.
- 3 Dilution due to matrix difficulties.
- 4 Dilution due to matrix difficulties.
- 5 Dilution due to matrix difficulties.
- 6 Dilution due to matrix difficulties.
- 7 Dilution due to matrix difficulties.
- 8 Dilution due to matrix difficulties.
- 9 Dilution due to matrix.
- 10 Water present in auto vial.

Attachments

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

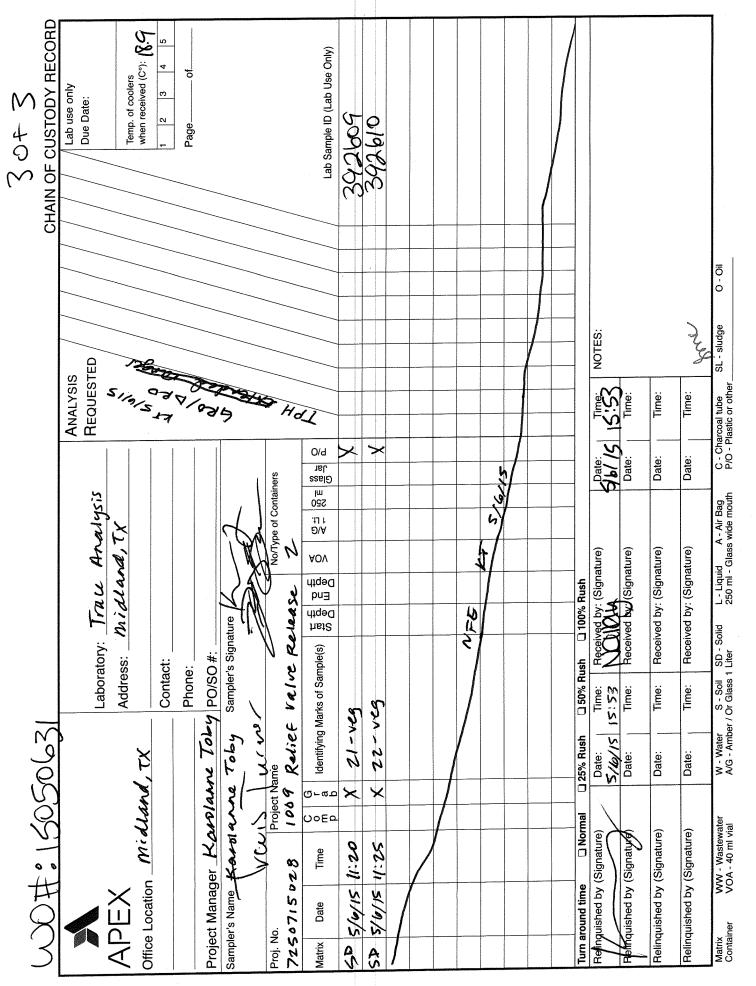


Apex TITAN, Inc. • 505 N. Big Springs Drive, Suite 301A • Midland, Texas 79701 • Office: 432-695-6016

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Lubbock, Texas 79424 Texas 79922 El Paso, Midland. Texas 79703 Texas 75006 Carroliton.

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

Certifications

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

Analytical and Quality Control Report

Karolanne Toby APEX/Titan 2351 W. Northwest Hwy. Suite 3321 Dallas, Tx, 75220

Report Date: June 19, 2015

FAX 915 • 585 • 4944

FAX 432 • 689 • 6313

Work Order: 15061104

915-585-3443

432-689-6301

972-242 -7750

Project Name: 1009 RELIEF VALVE Project Number: 7250715028.001

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
395360	Veg-14	soil	2015-06-10	09:10	2015-06-10
395361	Veg-15	soil	2015-06-10	09:15	2015-06-10
395362	Veg-16	soil	2015-06-10	09:18	2015-06-10

Notes

• Work Order 15061104: Straight from the fields, brought on ice

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.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 13 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

Report Contents

Case Narrative	4
Analytical Report Sample 395360 (Veg-14) Sample 395361 (Veg-15) Sample 395362 (Veg-16)	5 5 6
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Laboratory Control Spikes QC Batch 122354 - LCS (1) QC Batch 122455 - LCS (1)	9 9 9
Matrix Spikes I QC Batch 122354 - xMS (1) I QC Batch 122455 - MS (1) I	
Calibration Standards Image: Constraint of the sta	11 11
Report Definitions	12 12

Case Narrative

Samples for project 1009 RELIEF VALVE were received by TraceAnalysis, Inc. on 2015-06-10 and assigned to work order 15061104. Samples for work order 15061104 were received intact at a temperature of 6.0 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
TPH DRO - NEW	S 8015 D	103493	2015-06-15 at 18:45	122354	2015-06-16 at 12:26
TPH GRO	S 8015 D	103567	2015-06-18 at $10:39$	122455	2015-06-19 at $07:23$

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 15061104 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Analytical Report

Sample: 395360 - Veg-14

Laboratory:	Midland								
Analysis:	TPH DR	O - NEV	V	Anal	ytical Metho	d: S 8015	D	Prep Me	thod: N/A
QC Batch:	122354					2015-00	015-06-16 Analyzed		l By: SC
Prep Batch:	103493			Sam	Sample Preparation: 2015-06-15		Prepared	By: SC	
					I	RL			
Parameter			Flag	Cert	Rest	ılt	Units	Dilution	RL
DRO			$_{ m Qr,Qs}$	5	1	68	mg/Kg	2	50.0
							a 11	D	
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	$_{\rm Qsr}$		105	m mg/Kg	2	50.0	210	70 - 130

Sample: 395360 - Veg-14

Analysis: 7 QC Batch: 1	Midland FPH GRO .22455 .03567			Date Ana	al Methoo alyzed: Preparatio	2015-0	6-19		Prep Metho Analyzed B Prepared By	y: AK
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	1	U		5		<8.00	mg/ŀ	Ig	2	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene	e (TFT)				4.68	mg/Kg	2	4.00	117	70 - 130
4-Bromofluorob	benzene (4-BFB)				3.99	$\mathrm{mg/Kg}$	2	4.00	100	70 - 130

Sample: 395361 - Veg-15

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	122354	Date Analyzed:	2015-06-16	Analyzed By:	\mathbf{SC}
Prep Batch:	103493	Sample Preparation:	2015-06-15	Prepared By:	\mathbf{SC}

Report Date: June 19, 2015 7250715028.001

Work Order: 15061104 1009 RELIEF VALVE

Page Number: 6 of 13

					R	L			
Parameter		I	Flag	Cert	Resu	lt	Units	Dilution	RL
DRO		C	$_{ m Qr,Qs}$	5	251	0	mg/Kg	2	50.0
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	$2_{\rm Qsr}$	Qsr		436	m mg/Kg	2	100	436	70 - 130

Sample: 395361 - Veg-15

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 122455 103567			Date An	al Methoo alyzed: Preparatio	2015-0	6-19		Prep Metho Analyzed B Prepared B	y: AK
						RL				
Parameter		Flag		Cert		Result	Uni	ts	Dilution	RL
GRO	3	U		5		<8.00	mg/k	Ig	2	4.00
Surrogate			Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotolue	ene (TFT)				4.66	mg/Kg	2	4.00	116	70 - 130
4-Bromofluor	obenzene (4-BFB)				4.11	$\mathrm{mg/Kg}$	2	4.00	103	70 - 130

Sample: 395362 - Veg-16

Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRC 122354 103493	TPH DRO - NEW 122354			ytical Method: Analyzed: ble Preparation	2015-06-	16	Prep Me Analyzed Prepared	l By: SC
					RL				
Parameter		I	Flag	Cert	Result		Units	Dilution	RL
DRO		(Qr,Qs	5	2800	1	ng/Kg	2	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	4 Qsr	Qsr		323	m mg/Kg	2	100	323	70 - 130

Report Date: June 19, 2015 7250715028.001		V 1		Page Num	ber: 7 of 13			
Sample: 395362 - Veg-16								
Laboratory:MidlandAnalysis:TPH GROQC Batch:122455Prep Batch:103567	Prep Metho Analyzed B Prepared B	y: AK						
				RL				
Parameter	Flag	Cert		Result	Uni	ts	Dilution	RL
GRO ⁵	U	5		<8.00	mg/K	g	2	4.00
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			4.41	mg/Kg	2	4.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			3.84	mg/Kg	2	4.00	96	70 - 130

Method Blanks

QC Batch: 122354 Prep Batch: 103493				Analyzed: eparation:	2015-06-16 2015-06-15		v	ed By: SC ed By: SC
riep Daten. 100100			QC 11	eparation.			Tiopard	Ja Dy. De
					Μ	DL		
Parameter		Fla	ıg	Cert	Res	sult	Units	RL
DRO				5	<7	.41	m mg/Kg	50
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			48.8	mg/Kg	1	50.0	98	70 - 130

Method Blank (1)	QC Batch: 122455							
QC Batch: 122455 Prep Batch: 103567			nalyzed: eparation:	2015-06-19 2015-06-18			Analyzed Prepared	v
					MDL			
Parameter	Flag		Cert		Result		Units	RL
GRO			5		<2.32		mg/Kg	4
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	0		2.55	mg/Kg	1	2.00	128	70 - 130
4-Bromofluorobenzene (4	l-BFB)		2.15	mg/Kg	1	2.00	108	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 122354 Prep Batch: 103493			te Analy C Prepara		15-06-16 15-06-15				Analyz Prepare		$\frac{SC}{SC}$
			LCS			Spike	Ma	atrix		R	ec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Re	sult	Rec.	Li	mit
DRO		5	238	mg/Kg	1	250	<'	7.41	95	70 -	130
Percent recovery is based on the	spike res	ult. RPI) is base	d on the sp	pike and s	pike duplica	ate resi	ılt.			
		LCSI)		Spike	Matrix		Rec	з.	F	RPD
Param	F C	Resul	t Unit	ts Dil.	Amount	Result	Rec.	Lim	it F	RPD L	imit
DRO	5	271	mg/I	Kg 1	250	<7.41	108	70 - 1	130	13	20
Percent recovery is based on the	spike res	ult. RPI) is base	d on the sp	pike and s	pike duplica	ate resi	ılt.			
	LCS	LC	SD			Spike	LCS	S 1	LCSD	R	ec.
Surrogate	Result			Units	Dil.	Amount	Rec		Rec.		mit
n-Tricosane	52.8	58	3.4	m mg/Kg	1	50.0	106	j	117	70 -	130
Laboratory Control Spike (I	LCS-1)										
Laboratory Control Spike (I QC Batch: 122455 Prep Batch: 103567	CCS-1)		te Analy Prepara		5-06-19 5-06-18	Spike	М	F	Analyze Prepare	d By:	AK AK
QC Batch: 122455 Prep Batch: 103567		QC	C Prepara	ation: 201	5-06-18	Spike		F atrix	Prepare	d By:	AK ec.
QC Batch: 122455 Prep Batch: 103567 Param	2 CS-1) F	QC C	C Prepara LCS Result	ation: 201 Units	L5-06-18 Dil.	Amount	Re	F atrix esult	Prepare Rec.	d By: R Lin	AK ec. mit
QC Batch: 122455 Prep Batch: 103567	F	$\frac{C}{\frac{5}{100000000000000000000000000000000000$	C Prepara LCS Result 16.0 D is base	ation: 201 Units mg/Kg	5-06-18 Dil. 1 pike and s	Amount 20.0 pike duplica	Re <:	F atrix esult 2.32 ilt.	Prepare Rec. 80	d By: R Lin 70 -	AK ec. <u>mit</u> 130
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the	F spike res	$\frac{C}{\frac{5}{\text{ult. RPI}}}$	C Prepara LCS Result 16.0 D is base	units Units mg/Kg d on the sp	Dil. Dil. Dike and s Spike	Amount 20.0 pike duplica Matrix	Re <:	F atrix esult 2.32 ilt. Rec	Prepare Rec. 80	d By: R Lin 70 -	AK ec. <u>mit</u> <u>130</u> RPD
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QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the	F spike res F C	C 5 ult. RPI LCSI Resul 15.6	C Prepara LCS Result 16.0 D is base t Unit mg/I	ation: 201 Units mg/Kg d on the sp ts Dil. Kg 1	Dil. Dil. Dike and s Spike Amount 20.0	Amount 20.0 pike duplica Matrix Result <2.32	Rec. Rec. 78	$\begin{array}{c} \text{Atrix} \\ \text{ssult} \\ \hline 2.32 \\ \text{ilt.} \\ \hline \text{Rec} \\ \hline 100 \\ \hline 70 - 1 \end{array}$	Prepare Rec. 80	d By: R Lin 70 - RPD L	AK ec. <u>mit</u> <u>130</u> RPD
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the Param GRO	F spike res F C	$\begin{array}{c} & \\ & \\ \hline C \\ \hline 5 \\ \\ ult. RPI \\ \\ LCSI \\ Resul \\ \hline 15.6 \\ \\ ult. RPI \end{array}$	C Prepara LCS Result 16.0 D is base t Unit mg/I D is base	ation: 201 Units mg/Kg d on the sp ts Dil. Kg 1	Dil. Dil. Dike and s Spike Amount 20.0	Amount 20.0 pike duplica Matrix Result <2.32	Rec. Rec. 78 ate resu	$\begin{array}{c} \text{Atrix} \\ \text{ssult} \\ \hline 2.32 \\ \text{ilt.} \\ \hline \text{Rec} \\ \hline 100 \\ \hline 70 - 1 \end{array}$	Prepare Rec. 80	d By: Ri 10 - 70 - RPD L 3	AK ec. <u>mit</u> 130 RPD .imit
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the Param GRO	F spike res F C	QC 5 ult. RPI LCSI Resul 15.6 ult. RPI L	C Prepara LCS Result 16.0 D is base t Unit mg/I D is base CS I	ation: 201 Units mg/Kg d on the sp ts Dil. Kg 1 d on the sp LCSD	Dil. Dil. 1 pike and s Spike Amount 20.0 pike and s	Amount 20.0 pike duplica Matrix Result <2.32 pike duplica	Rec. Rec. 78 ate resu	F atrix esult 2.32 dt. Rec Lim 70 - 1 dt.	Prepare Rec. 80 c. iit F 130	d By: R Lin 70 - RPD L 3	AK ec. <u>mit</u> 130 RPD imit 20
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Matrix Spikes

Matrix Spike (xMS-1) Spik	ed Samp	le: 3954'	71								
QC Batch: 122354 Prep Batch: 103493				v	2015-06-16 2015-06-15					nalyzec eparec	
Param	F	\mathbf{C}	MS Resu		its Dil		Spike mount		trix sult	Rec.	Rec. Limit
DD0	Г)s Qs	5	1560			. A	$\frac{100000}{250}$		580	-48	70 - 130
Percent recovery is based on the s				07	Ŭ	snike				10	10 100
i creent recovery is based on the s	pike res			sea on une	-	-	uupiica	ate resu			
D	Б		ISD	TT •/	Spi		Matrix	р	Rec.		RPD
Param DRO Qr,	F		esult 270	Units mg/Kg	$\frac{\text{Dil. Amo}}{1 25}$		Result 1680	Rec.	Limit 70 - 13		$\frac{\text{PD Limit}}{20 20}$
										50 2	20 20
Percent recovery is based on the s	pike resi	ult. RPI) is ba	sed on the	e spike and	spike	duplica	te resu	lt.		
	MS	I 1	MSD			S	Spike	Μ	S N	ISD	Rec.
Surrogate	Resu		Result	Units		A	mount	Re		Rec.	Limit
n-Tricosane _{Qsr Qsr}	130)	109	mg/K	g 1		50	26	0 2	218	70 - 130
Matrix Spike (MS-1) Spike QC Batch: 122455 Prep Batch: 103567	l Sample		te Ana	v	2015-06-19 2015-06-18					alyzed epared	v
QC Batch: 122455	l Sample	Dat	te Ana	v		S	Spike	Ma		v	v
QC Batch: 122455 Prep Batch: 103567 Param	l Sample F	Dat	te Ana Prepa MS Resul	aration: 2	2015-06-18		Spike mount	Res	Pre trix sult	v	By: AK
QC Batch: 122455 Prep Batch: 103567	-	Dat QC	te Ana Prepa MS	aration: 2	2015-06-18 ts Dil.	. Ai	-	Res	Pre	epared	By: AK Rec.
QC Batch: 122455 Prep Batch: 103567 Param	F	Dat QC C	te Ana Prepa MS Resul 14.2	t Unit mg/I	$\frac{2015-06-18}{\text{ts}}$. Ai	mount 20.0	Res <2	Pre trix sult .32	epared Rec.	By: AK Rec. Limit
QC Batch: 122455 Prep Batch: 103567 Param GRO	F	Dat QC <u>C</u> 1lt. RPI	te Ana Prepa MS Resul 14.2	t Unit mg/I	$\frac{1}{2015-06-18}$	Aı spike	mount 20.0 duplica	Res <2	Pre trix sult .32 lt.	epared Rec.	By: AK Rec. Limit 70 - 130
QC Batch: 122455 Prep Batch: 103567 Param GRO	F	Dat QC C	te Ana Prepa MS Result 14.2 D is ba	t Unit	2015-06-18 ts Dil. Xg 1 spike and Spike	Aı spike	mount 20.0 duplica atrix	Res <2	Pre trix sult .32	epared Rec.	By: AK Rec. Limit 70 - 130 RPD
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the s	F pike rest	Dat QC <u>c</u> 11t. RPI MSD	te Ana Prepa MS Resul 14.2 D is ba t U	$\frac{t \qquad \text{Unit}}{\frac{\text{mg/I}}{\text{sed on the}}}$	$\frac{2015-06-18}{\text{Kg}}$	Aı spike Ma nt Re	mount 20.0 duplica atrix	Res <2 te resu	Pre trix sult .32 lt. Rec.	Rec. 71 RH	By: AK Rec. Limit 70 - 130 PD Limit
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the s Param	F pike rest F C 5	Dat QC <u>5</u> ılt. RPI MSD Result 14.3	te Ana Prepa MS Result 14.2 D is ba t Un mg	$\frac{t \qquad \text{Unit}}{\text{mg/I}}$ sed on the nits $\frac{1}{3}$	2015-06-18 Kg 1 e spike and Spike . Amour 20.0	And Spike of And	mount 20.0 duplica atrix esult 2.32	Res <2 te resu Rec. 72	Pre trix sult .32 lt. Rec. Limit 70 - 130	Rec. 71 RH	By: AK Rec. Limit 70 - 130 PD Limit
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the s Param GRO	F pike rest F C 5	Dat QC 5 1lt. RPI MSD Result 14.3 1lt. RPI	te Ana Prepa MS Result 14.2 D is ba t Un mg D is ba	$\frac{t \qquad \text{Unit}}{\text{mg/I}}$ sed on the nits Dil s/Kg 1 sed on the	2015-06-18 Kg 1 e spike and Spike . Amour 20.0	And Spike of And	mount 20.0 duplica atrix esult 2.32 duplica	Res <2 te resu Rec. 72 te resu	Pretormation $rectarrow relation relation rectarrow relation relatio rela$	Rec. 71 RI D 1	By: AK Rec. Limit 70 - 130 PD Limit L 20
QC Batch: 122455 Prep Batch: 103567 Param GRO Percent recovery is based on the s Param GRO	F pike rest F C 5	Dat QC <u>5</u> alt. RPI MSD Result 14.3 alt. RPI	te Ana Prepa MS Result 14.2 D is ba t Un mg	$\frac{t \qquad \text{Unit}}{\text{mg/I}}$ sed on the nits $\frac{1}{3}$	2015-06-18 Kg 1 e spike and Spike . Amour 20.0	And Spike of And	mount 20.0 duplica atrix esult 2.32	Res <2 te resu Rec. 72 te resu ke	Pre trix sult .32 lt. Rec. Limit 70 - 130	Rec. 71 RH	By: AK Rec. Limit 70 - 130 PD Limit
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Calibration Standards

Standard (CCV-1)

QC Batch:	122354	4 Dat			2015-06-16		Analyzed By: SC		
				CCVs	$\rm CCVs$	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		5	mg/Kg	250	226	90	80 - 120	2015-06-16	

Standard (CCV-2)

QC Batch:	122354	22354 Da			2015-06-16		Analy	vzed By: SC
				CCVs	$\rm CCVs$	$\rm CCVs$	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		5	m mg/Kg	250	233	93	80 - 120	2015-06-16

Standard (CCV-1)

QC Batch:	122455		Date	Analyzed:	2015-06-19		Analy	zed By: AK
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		5	mg/Kg	1.00	1.01	101	80 - 120	2015-06-19

Standard (CCV-2)

QC Batch:	122455	Date An			2015-06-19		Analy	zed By: AK
				CCVs True	$\begin{array}{c} \mathrm{CCVs} \\ \mathrm{Found} \end{array}$	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		5	m mg/Kg	1.00	0.946	95	80 - 120	2015-06-19

Work Order: 15061104 1009 RELIEF VALVE Page Number: 12 of 13

Appendix

Report Definitions

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

Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2014-018	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.

Work Order: 15061104 1009 RELIEF VALVE Page Number: 13 of 13

F Description

Qsr Surrogate recovery outside of laboratory limits.

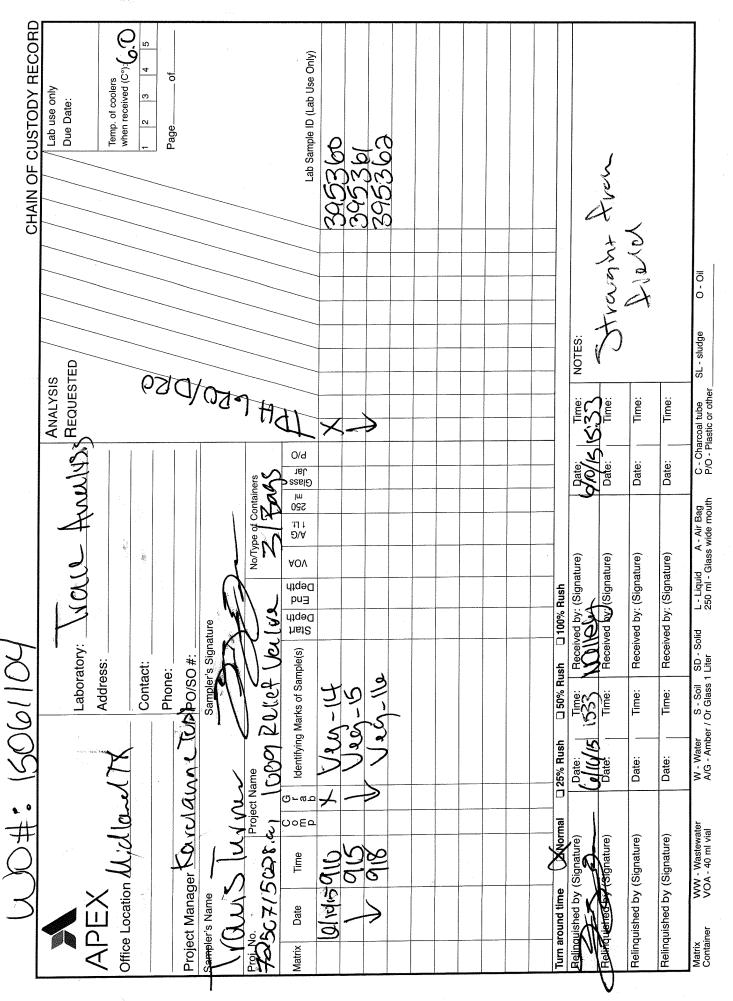
U The analyte is not detected above the SDL

Result Comments

- 1 Dilution due to matrix.
- 2 Analyst double spiked surrogate.
- 3 Dilution due to matrix.
- 4 Analyst double spiked surrogate.
- 5 Dilution due to matrix.

Attachments

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



Apex TITAN, Inc. • 2351 W. Northwest Hwy., Suite 3321 • Dallas, Texas 75220 • Office: 214-350-5469 • Fax 214-350-2914

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APPENDIX E

NMOCD C-141

NM OIL CONSERVATION

ARTESIA DISTRICT

District 1 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 MAR **2 3** 2015 Energy Minerals and Natural Resources

AAR 2 3 2015 Revised August 8, 2011 RECEIVE Dopy to appropriate District Office in accordance with 19.15.29 NMAC.

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

fab150	8435	5844	Rele	ease Notifi	cation and Co	orrective A	ction		
NAB 15	50843	36016		OPERATOR				al Report	Final Report
			eia <mark>Servi</mark>	Services LLC Contact Dina Babinski					
Address PC) Box 432	4, Houston '	FX 7721()	Telephone 1	No. 210-528-38	24		
Facility Nat	ne Pipelir	ne ROW, 10	09 Gathe	ering Lateral	Facility Typ	e Gas Gatheri	ng Pipeline		
Surface Ow	mer Depa	rtment of Ei	nergy		Owner NA - Pipelin ATION OF RE		API No	. NA	
Unit Letter E	Section 15	Township 22S	Range 31E	Feet from the 421	North/South Line North	Feet from the 7	East/West Line East	County Eddy	
		1		Latitude <u>/</u>	V <u>32.392</u> Longitude	e <u><i>W -103.770</i></u>	·		
				NAT	TURE OF REL	EASE			
T	N1-4	LC. Dinella	. Timutal	······································	Valuma al	Dalassa 34 MC	E 10 Volumo	Concurred N	T &

Type of Release Natural Gas, Pipeline Liquids	Volume of Release 24 MCF, 10 bbl	Volume Recovered NA
Source of Release Pipeline Relief Valve	Date and Hour of Occurrence Unknown	Date and Hour of Discovery 3/18/2015 @ 11:30 MDT
Was Immediate Notice Given?	If YES, To Whom?	
🛛 Yes 🗌 No 📋 Not Required	Mike Bratcher	
By Whom? Osman De Leon	Date and Hour 3/18/2015 2:52 MD	
Was a Watercourse Reached?	If YES, Volume Impacting the Wat	ercourse.
🛄 Yes 🕅 No		
If a Watercourse was Impacted, Describe Fully.*		••••••••••••••••••••••••••••••••••••••
Describe Cause of Problem and Remedial Action Taken.*		
A pipeline relief valve opened and spilled approximately 10 bbl pipeli		ayed surrounding area. Neither the valve
nor the pipeline were damaged during the event, and thus no repairs	were required.	
Describe Area Affected and Cleanup Action Taken.*		
·		
Contaminated area is being marked and soil sampling will be perform	ned to determine extent of contamin	ation in soil. Remediation activities will
be selected based on the results of the sampling. Additional soil samples	ling will be performed once remedia	tion is complete to confirm cleanup is
complete.		
I hereby certify that the information given above is true and complete to t	he best of my knowledge and understa	nd that pursuant to NMOCD rules and
regulations all operators are required to report and/or file certain release n	otifications and perform corrective act	tions for releases which may endanger
public health or the environment. The acceptance of a C-141 report by the		
should their operations have failed to adequately investigate and remediat		
or the environment. In addition, NMOCD acceptance of a C-141 report d federal, state, or local laws and/or regulations.	loes not relieve the operator of respons	sollity for compliance with any other
reacting state, or local laws and or regulations.	OUL CONSERV	ATION DIVISION
	OIL CONSERV	ATTON DIVISION
Signature: Van Prefet	Signed By	like Kenner
	Approved by	UTT PARMINUM
Printed Name: Jon Fields		
Title: Director, Field Environmental	Approval Date: 3/26/15	Expiration Date: N/A
The Diferry Field Earth Ortherith		
E-mail Address: snolan@eprod.com	Conditions of Approval:	Attached
200 0011	Remediation per O.C.D. Rule	es & Guidelines
Date: 2.26 (0/) Phone: 713-381-6595	SUBMIT REMEDIATION PRO	POSALNO
Attach Additional Sheets If Necessary	LATER THAN: 4125/15	1 DONALE
		LKY - LY(1)



APPENDIX F

BLM Approved Workplan

Response/Remediation Plan Enterprise Field Services, LLC 1009 Relief Valve Release Site Section 15 Township 22 South Range 31 East

April 22, 2015

Enterprise Field Services, LLC (Enterprise) is submitting this Response/Remediation Plan to the New Mexico Oil Conservation Division (NMOCD), Bureau of Land Management (BLM) and Waste Isolation Pilot Project (WIPP) operated by Department of Energy (DOE) to mitigate the release of natural gas and natural gas liquids associated with the Enterprise 1009 natural gas gathering pipeline. The Response/Remediation plan describes how Enterprise will respond to the release under NMOCD jurisdiction. The GPS coordinates for the release site are N 32.39358, W 103.77006.

Site History

Enterprise was notified of the release on March 10, 2015 by BLM. No water courses were affected. Three areas of impact have been noted, originating from the release point at the pressure relief valve. Two fluid spray ("spray area") areas were noted which extend to the northeast and the northwest near the cattle pens. Liquid contamination was observed around the valve and remaining on the Right-of-Way (ROW), flowing west down the lease road, with fluid staining approximately 145 feet long by three (3) feet wide, observed on the ground surface. Surface impacts of the spray area are approximately 3.6 acres to the northwest and approximately 1.7 acres to the northeast. The pipeline ROW is 50 feet wide perpendicular to the length of the pipeline. The approximate area of the surface indication of the impact is shown on the attached Figure 1.

Site Ranking

The ranking for this release has been determined by site specific criteria outlined in the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases* (1993). This release location has been assigned an NMOCD ranking of 0, which requires a soil remediation standard of 10 parts per million (ppm) benzene, 50 ppm combined benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 5,000 ppm total petroleum hydrocarbons (TPH).

Assessment and Field Work

The primary objective of corrective actions at the site will be to reduce the concentration of constituents of concern (COCs) in the on-Site soils below the NMOCD *Remediation Action Levels* using the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.

All field activities will be overseen by a third party environmental contractor. The third party environmental contractor will delineate the perimeters of the two spray areas and treat the affected areas by applying a microbial-decomposition product (Microblaze®) to introduce additional nonpathogenic bacterial strains designed to metabolize petroleum hydrocarbons. Any equipment and cattle pens affected within spray areas will be power washed with the hot Microblaze solution. For the "spray area" and power washing activities, a 3% mixture of Microblaze and water will be utilized.

Attached to the Response/Remediation plan is a Natural and Cultural Resources Due Diligence Memorandum. The results indicate that the project area is within the current range of the lesser prairiechicken (LEPC). As required by conservation measures, remediation activities will not occur between 3 am and 9 am. Remediation activities will be limited to the application of Microblaze, eliminating any ground disturbance that would affect potentially buried archaeological deposits. Preliminary soil samples (CS-1, CS-2 and CS-3) were collected form the liquid contamination area and analyzed for BTEX, TPH, chlorides and RCRA (Resource Conservation and Recovery Act) (8) Metals which include arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver. A Site Plan depicting the approximate location of the affected areas and confirmation soil sample locations is included as attachment Figure 1 – Site Map and Figure 1A – Affected Area Detail Map. Based on soil confirmation analytical results, contaminant concentrations for BTEX and TPH are compliant with the NMOCD site specific remediation standards (site ranking). The confirmation soil sample CS-2 chloride concentration is 1,260 milligrams per Kilogram (mg/Kg), which is in excess of the NMOCD recommended site ranking remediation standards. The chloride contaminated area was within the pipeline work areas and access roads, so there is no adverse effect on the vegetation.

The spray areas will be sampled approximately four (4) to five (5) weeks after the first application of the Microblaze solution. One confirmation soil sample and vegetation sample will be collected per 100 foot spacing of each spray area. The vegetation to be sampled will be limited to forage species based on the concern of grazing livestock. Enterprise will notify the BLM, WIPP and DOE forty-eight (48) hours prior to the collection of the final (closure) soil and vegetation samples.

Soil samples will be analyzed per the following United States Environmental Protection Agency Methods:

- Method 8021 BTEX
- Method 8015B DRO/GRO (Diesel Range Organics/Gasoline Range Organics)
- Method SM 4500-Cl B (Chlorides)

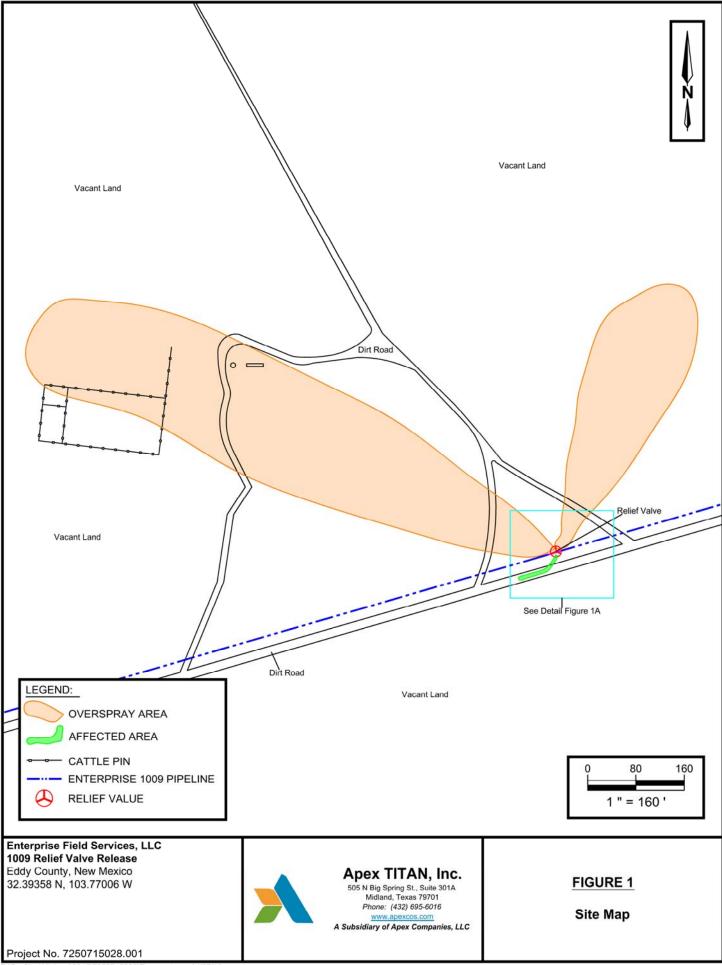
Upon confirmation that BTEX and TPH concentrations comply with the applicable NMOCD remediation standard, the laboratory analytical reports will be emailed to the BLM for prompt review.

Documentation

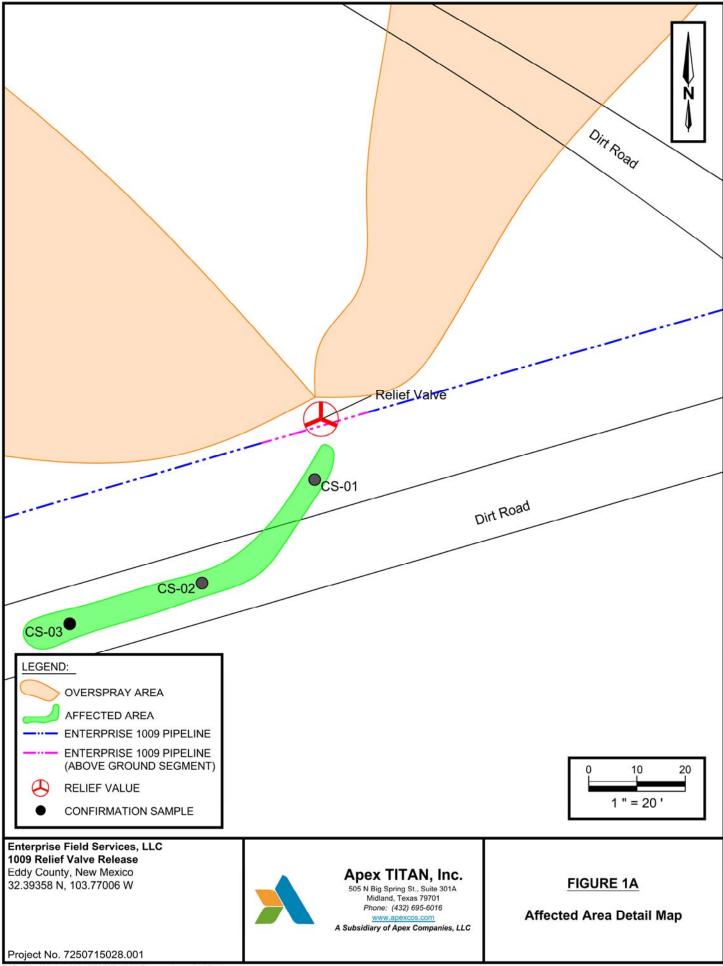
Upon completion of remediation activities, the third party environmental contractor will prepare and submit a Corrective Action Report (CAR) documenting the field work. The CAR will include the following information:

- Description of the field activities
- Site Map illustrating sample locations (as applicable)
- Laboratory Analytical Reports for soil samples collected
- Photographic documentation

Attachments Figure 1 – Site Map Figure 1A – Affected Area Detail Map Natural and Cultural Resources Due Diligence Memorandum



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TO:Dina Babinski, Enterprise Field Services, LLCFROM:Robin Laine, Apex TITAN, Inc.SUBJECT:Natural and Cultural Resources Due Diligence for Casing Installation the 1009
Relief Valve Overspray in Eddy County, NMDATE:April 1, 2015

The purpose of this memorandum is to provide a desktop review for natural and cultural resources constraints for a relief valve overspray that occurred on an existing pipeline in Eddy County, NM. The project is located at 32.394009, -103.77062. The footprint of the action includes oblong areas within approximately 945 feet northwest of the release and 470 feet northeast of the release. Figure 1 below shows the project extent. Apex understands that the pipeline easement is on land managed by the Bureau of Land Management (BLM) and the overspray area is on land managed by the Department of Energy (DOE).

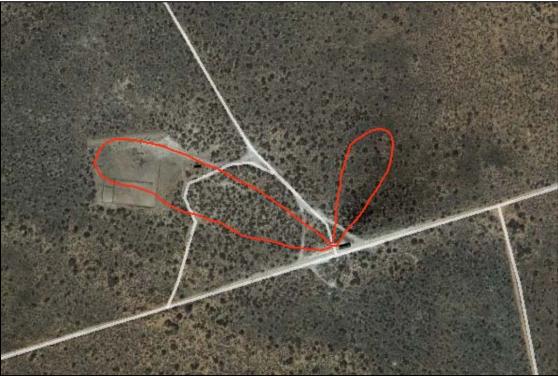


Figure 1 – Approximate Project Extent

Potential Waters of the U.S.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has the authority to permit the discharge of dredged or fill material into waters of the United States (U.S). The term "waters of the U.S." is defined as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;

- All impoundments of waters otherwise defined as waters of the U.S. under the definition;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) Which are used or could be used for industrial purpose by industries in interstate commerce; and
- The territorial seas.

In 2006, Rapanos v. United States clarified that waters of the U.S. are also defined as: Traditional Navigable Waters (TNW) and their adjacent wetlands; non-navigable tributaries of TNWs that are relatively permanent; and, wetlands that directly abut such tributaries. In addition, the Rapanos decision clarified that the USACE asserts jurisdiction over every water body that is not a relatively permanent water (RPW) if that water body is determined to have a significant nexus with a TNW. A significant nexus exists if the tributary, in combinations with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, or biological integrity of a TNW.

The limit of USACE jurisdiction for non-tidal waters of the United States in the absence of adjacent wetlands is the ordinary high water mark (OHWM). "Ordinary high water mark" is defined as that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Results

Using aerial imagery, USGS 7.5' topographic quadrangle maps (Figure 2), National Hydrography Dataset (NHD), the National Wetlands Inventory (NWI) database, and site photographs, the project area was assessed for the presence of potential jurisdictional waters of the U.S., including wetlands. No potential waters of the U.S. were identified during the background search. The project does not appear to be subject to Section 404 of the Clean Water Act. No further action is recommended.

Federally-listed Species Habitat

The United States Fish and Wildlife Service (USFWS) has authority under the Endangered Species Act (ESA) to list and monitor the status of species whose populations are considered imperiled. Species listed as threatened or endangered by the USFWS are provided full protection under the ESA including a prohibition of indirect "take." The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct with regards to a federally-endangered species. Critical habitat is also protected under the ESA. Critical habitat is defined as areas that are essential for the conservation of a threatened or endangered species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA.



According to the USFWS Information, Planning, and Conservation System (IPaC), fifteen species were identified in Eddy County, New Mexico to be considered in the effects analysis for the project area and were assessed by this study. Table 1 provides a species list, habitat summary, and evaluation of potential occurrence in the project area.

Common Name	Scientific Name	Federal Status	Species Likely to Occur in Project Area?
Least Tern	Sterna antillarum	E	No; there are no rivers or beaches consistent with tern migratory or nesting habitat.
Lesser Prairie- chicken	Tympanuchus pallidicinctus	Т	The project is within the range of the species. See discussion below.
Mexican Spotted owl	Strix occidentalis lucida	т	No; no structurally complex old growth or mature forests, mixed conifer forests, or canyons are within the vicinity of the project.
Northern Aplomado Falcon	Falco femoralis septentrionalis	Experimental Population, Non- Essential	Yes, the open grassland terrain in the project area is potential habitat for the species. However, if falcons occur in the area, they will likely be flying overhead. No nesting habitat is present in the project area.
Piping Plover	Charadrius melodus	т	No; no preferred shoreline or riverine habitat is within the vicinity of the project.
Southwestern Willow flycatcher	Falco femoralis septentrionalis	E	No; no dense riparian cottonwood/willow and tamarisk habitat is present in the vicinity of the project. No saturated soils, standing water, pools, streams, or cienegas.
Sprague's Pipit	Anthus spragueii	С	Unlikely; mixed grasslands and wet meadow breeding habitat is not present in the vicinity of the project. The species may migrate through the area.
Texas Hornshell	Popenaias popei	С	No; no aquatic habitat is present in the vicinity of the project.
Pecos Bluntnose shiner	Notropis simus pecosensis	т	No; no aquatic habitat is present in the vicinity of the project
Pecos gambusia	Gambusia nobilis	E	No; no aquatic habitat is present in the vicinity of the project
Gypsum wild- buckwheat	Eriogonum gypsophilum	Т	No; known only to occur in three populations that are distant from the project area. Restricted to almost pure gypsum habitats, which are not located in the vicinity of the project.

Table 1: Endangered, Threatened, and Candidate Species in Eddy County, New Mexico



Common Name Scientific Name		Federal Status	Species Likely to Occur in Project Area?
Kuenzler Hedgehog cactus	Echinocereus fendleri var. kuenzleri	E	No; no preferred habitat of gravelly or rocky slopes, benches, limestone, or sandstone.
Lee Pincushion cactus	Coryphantha sneedii var. leei	Т	No; limestone cracks and steep slopes not present. The project is below the typical occurrence elevation of the species of 4,000 to 5,000 ft.
Sneed Pincushion cactus	Coryphantha sneedii var. sneedii	Е	No; limestone cracks and steep slopes not present.
Wright's Marsh thistle	Cirsium wrightii	С	No; no wet, alkaline soils around spring seeps or marshy pond or stream edges are within the project area.

E – Endangered, T – Threatened, C - Candidate

Lesser Prairie-chicken

The project area is within the current range of the lesser prairie-chicken (LEPC). In New Mexico, LEPC habitat consists of sand shinnery communities dominated by shinnery oak (*Quercus havardii*) and various native grasses. From March to July, male LEPC gather on breeding grounds, known as leks, to perform mating displays for females. According to the Southern Great Plains Crucial Habitat Assessment Tool (CHAT), previous surveys in the last 5 years have not identified the presence of leks within the immediate vicinity of the project. A historic lek is known approximately 12 miles east of the project. The nearest known current lek is 54 miles north of the project. However, much of the LEPC range in New Mexico has not been surveyed for the presence of leks.

The project is on federal land and is therefore not eligible for enrollment in the LEPC Range-wide Conservation Plan (RWP). Under Section 7 of the Endangered Species Act, federal agencies are responsible for ensuring that federal actions, including those funded or authorized by the agency, do not jeopardize the existence of any federally-protected species. Apex recommends coordinating with BLM and/or DOE regarding minimization strategies and best management practices to avoid effects to LEPC.

Cultural Resources

There have been a few small negative cultural resource surveys conducted for the BLM in the general area of the proposed Project. However, no cultural resource surveys have been conducted, and therefore, no cultural resource sites have been have recorded within the proposed project area. The project area is located in hummocky sand dunes, stabilized against wind erosion by native vegetation; these have good potential for containing buried archeological deposits. As the responsible federal agency, the BLM, Roswell District, and/or the DOE should be contacted to determine whether they would require immediate cleanup of the released material and whether it should be preceded or followed by a cultural resource investigation. The BLM and/or DOE has the final authority to determine the need for a cultural resource investigation. The proposed project is subject to the provisions of Section 106 of the NHPA and a BLM permit could be necessary. Any archeological permitting would likely require consultation with the BLM Archeologists located in the Carlsbad Field Office.



Migratory Bird Treaty Act

The migratory Bird Treaty Act (MBTA) makes it illegal to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird...or any part, nest, or egg of any such bird."

Burrowing Owl

Apex understands that burrowing owls (*Athene cunicularia*) may have been observed in the vicinity of the project. Burrowing owls are protected under the MBTA, but are not protected by the State of New Mexico. According to USFWS, the New Mexico population of burrowing owl is apparently secure¹.

Burrowing owls are generally found on breeding grounds from mid-March through September, with courtship and pair formation in March and April in most areas. Burrowing owls generally stay close to the nest burrow during daylight and forage farther from the nest between dusk and dawn¹. USFWS recommends that construction activities should not occur within 250 feet of an active nest².

According to Ms. Kristin Madden, Bird Program Manager at the New Mexico Department of Game and Fish Wildlife Management Division and participant in the New Mexico Burrowing Owl Work Group, burrowing owls have not likely started to nest at this point in the season (pers. comm March 25, 2015). As such, impacts to active nest burrows are unlikely. Please see Attachment A for additional guidance. Coordination with the BLM and/or DOE may be warranted if burrowing owls appear to be exhibiting nesting behaviors.

Please feel free to contact me if you have any further questions or comments.

Sincerely,

255 Laine

Robin Laine National Program Manager, Natural Resources

² U.S. Fish and Wildlife Service. 2015. Protecting Burrowing Owls At Construction Sites. Nevada Fish and Wildlife Office. Available online at http://www.fws.gov/nevada/nv_species/burrowing_owl.htm



¹ U.S. Fish and Wildlife Service. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. Biological Technical Publication. BTP-R6001-2003.

Attachment A



GUIDELINES AND RECOMMENDATIONS FOR BURROWING OWL SURVEYS AND MITIGATION

NEW MEXICO DEPARTMENT OF GAME AND FISH

JULY 2007

(Note: Most of the following recommendations were developed by the New Mexico Burrowing Owl Working Group (2005), The California Burrowing Owl Consortium (1993), and The California Department of Fish and Game (1995))

The burrowing owl (*Athene cunicularia*) is considered a species of concern by the U.S. Fish and Wildlife Service and is protected by both the Migratory Bird Treaty Act and by New Mexico statute 17-2-14 (NMSA 1978). These guidelines are provided to assist in conducting burrowing owl surveys and mitigation during the preparation of environmental assessment reports and environmental impact statements. The guidelines also aid in the decision making process implemented when there is potential for any type of project to adversely affect burrowing owls or any of the resources that support them.

Project proponents should: 1) identify burrowing owl habitats and burrows; 2) choose and implement an appropriate survey method to confirm the presence of owls; and 3) determine and implement appropriate mitigation.

Step 1. Identify Burrowing Owl Habitat and Burrows

Seventy-five percent of New Mexico's ecological zones, as described by Dick-Peddie (1993), support or have the potential to support burrowing owls (Arrowood et al. 2001). These zones include: Chihuahuan desert scrub, closed basin scrub, desert grassland, Great Basin desert scrub, juniper savanna, lava beds, plains-mesa grassland, plains-mesa sand scrub, sand dunes, urban, and farmland (Arrowood et al. 2001). More specifically, burrowing owls generally are associated with dry, open, short-grass, treeless plains (Haug et al. 1993). Burrowing owls are also known to use areas that include shrubs such as creosote bush (*Larrea tridentata*), mesquite (*Prosopis* spp.), four-wing saltbush (*Atriplex canescens*), and rabbit-brush (*Chrysothanmus nauseous*) (Martin 1973, Botelho and Arrowood 1996). Burrowing owls also inhabit human-modified landscapes, such as golf courses and parking lots.

Burrowing owls rarely dig their own burrows and, therefore, depend in part upon the presence of burrowing animals. In New Mexico, burrowing owls are associated with Gunnison's prairie dogs (*Cynomys gunnisoni*), black-tailed prairie dogs (*C. ludovicianus*), American badgers (*Taxidea taxus*), ground squirrels (*Spermophilus* spp.), rock squirrels (*S. variegatus*), foxes (*Vulpes* spp.), and coyotes (*Canis latrans*). Burrowing owls and prairie dogs are included as species of greatest conservation need in the western great plain shortgrass prairie vegetation type (Comprehensive Wildlife Conservation Strategy for New Mexico 2006). Burrowing owls can also utilize human-made structures, such as, storm drains, berms, roadsides, irrigation canals, and artificial burrows specifically constructed for the owls.

Occupancy of suitable burrowing owl sites can be verified by observing at least one burrowing owl, or owl molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance (The California Burrowing Owl Consortium 1993).

Step 2. Choose and Implement an Appropriate Survey Method to Confirm Owl Presence

The most suitable time to survey for burrowing owls in New Mexico is during the nest initiation and incubation phases (Table 1). Most burrowing owls are migratory in the state, although some over-winter in New Mexico, particularly males in southern New Mexico (Arrowood et al. 2001, Johnson et al. 1997). Migratory owls typically arrive on the breeding grounds by March and remain there until October.

Table 1. General breeding chronology of the burrowing owl in New Mexico.

Location	Pair Bonding/Nest Initiation	Egg Laying and Incubation	Chicks Fledge above Ground	Independence
New Mexico	March to April	Late April to early June	Early-Mid June	Mid-Late July

Surveys should not be conducted in certain weather conditions when owls are more likely to be in their burrows and not visible, such as temperatures above 30°C (86°F) and winds exceeding 20 km/hr (approx. 12 mph). Surveys also should be restricted to the early morning and evening hours, because above ground activity is often higher during these times (Conway and Simon 2003).

A single survey on a proposed project site is adequate to determine the presence or absence of active burrows. If owls are not observed, all active burrows should be inspected for indications of use by the presence of owl pellets, droppings, or feathers. If active burrows are found follow-up survey, utilizing the methods described below, should be scheduled to confirm the presence or absence and numbers of owls on a project site.

Burrowing owl surveys can be accomplished effectively by either walking or driving transects. Either the entire length of the transect or point count stations along the transect can be surveyed, and surveys can be conducted with or without broadcasting audio burrowing owl alarm (*quick-quick-quick*) and/or male territory (*coo-coo*) calls. Studies have shown that broadcasting calls increases detection probability of burrowing owls (Haug and Didiuk 1993, Conway and Simon 2003) and that trained surveyors can detect owls up to 300 m (Conway and Simon 2003). These methods might need to be modified depending upon the terrain and equipment being used, which, respectively, affect the distance owls and the broadcasted vocalizations can be heard.

If burrowing owl habitat is found at the project site, a 150-m buffer zone around the project should also be assessed for potential burrowing owl habitat. At the project site, use one of the following survey methods as recommended by the New Mexico Burrowing Owl Working Group (NMBOWG).

METHOD 1: Walking Surveys

Without Audio Calls

Transects should be established in suitable owl habitat. A single, straight line should be walked for the entire length of the transect (for specific protocol and comparison of line transect methodology see Emlen 1971 and 1977). Observers should record all owls observed along either side of the line. If a more thorough estimate of abundance in a specific area is desired, an observer should walk multiple parallel lines (or many observers walk parallel lines concurrently) that are approximately 50 m apart. All owls observed along either side of the transect line should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

With Audio Calls

Observers should proceed along a transect line, stopping at points approximately every 200 m to broadcast owl vocalizations and listen for responses. Distance between points will depend upon terrain and broadcast system , which, respectively, affect the distance owls and the broadcasted vocalizations can be heard. If the broadcast system and owl response calls, can be heard up to 200 m. then the observer should stop every 200 m. The distance between observation points can be shortened if necessary. If a more thorough estimate of abundance is desired, the observer should walk multiple parallel lines (or many observers walk parallel lines concurrently) to cover a greater proportion of the area. The lines should be spaced according to the same distance of audio coverage. At each observation point, the observer should scan for any owls with binoculars for the first two minutes, after which a territorial and/or alarm calls should be played for one minute. Finally, there should be two additional minutes of scanning after broadcasting. Scanning and broadcasting should be done in a 360° arc. All owls detected during this five-minute observation period should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

METHOD 2: Roadside Point-count Surveys

Without Audio Calls

Routes should be established along roads in the project site. Observers should stop the vehicle and pull off the side of the road at 0.5-mile (0.8 km) intervals (if project site is large enough). If visibility is impaired at a point, observers should continue until the next immediate suitable surveying spot is reached. All surveyors should exit the vehicle at each point and scan with binoculars in a 360° arc for a total of five minutes. All owls detected during this five-minute observation period should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

With Audio Calls

Routes should be established along roads in the project site. Observers should stop the vehicle and pull off the side of the road at 0.5-mile (0.8km) intervals (if project site is large enough). If visibility is impaired at a point, observers should continue until the next immediate suitable surveying spot is reached. Observers should exit the vehicle at each point and scan for the first two minutes. Afterwards, owl calls (territorial and/or alarm) should be played for one minute, followed by two additional minutes of scanning. Scanning should be done with binoculars in a 360° arc. All owls detected during this five-minute observation should be recorded. Data recorded should include: date and time of survey, weather conditions, dominant vegetation, burrow aspect, survey location (including GPS coordinates), number of owls observed, sex and age classes of owls (if determinable), and presence of prairie dogs and other burrowing animals.

Step 3. Determine and Implement Appropriate Mitigation

The objectives of these mitigation guidelines are to minimize the negative impacts to burrowing owls at a project site and preserve habitat that will support burrowing owl populations into the future. The mitigation process begins with the survey protocol to document the presence of burrowing owl habitat, and to determine if burrowing owls use the project site and the surrounding buffer zone. Occupied burrows should be determined based on survey information. If more than 30 days elapse between the initial survey and construction activities, project sites and buffer zones with suitable habitat should be resurveyed to ensure no burrowing owls have occupied these areas in the interim period. Resurveying the project site should be conducted no more than 30 days prior to initial project initiation. If ground disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site should be resurveyed.

If burrowing owls are present on a project site, the following mitigation measures should be followed to minimize negative impacts to burrowing owls, nest burrows and burrowing owl habitat.

According to the California Burrowing Owl Consortium there are three definitions of negative impacts:

- Disturbance or harassment within 50 m of occupied burrows.
- Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs and debris piles that provide shelter to burrowing owls.
- Destruction and/or degradation of foraging habitat adjacent to occupied burrows (within 100 m).

If burrowing owls are found at a project site, measures to avoid or mitigate negative impacts should follow one of three general approaches. These approaches are listed below:

- 1. Design and implement project activities to spatially avoid negative impacts and disturbance to burrowing owls and their habitat.
 - No disturbance should occur within 50 m of occupied burrows during the non-breeding season (September through February) or within 75 m during the breeding season (March through August). Avoidance also requires that a minimum of 6.5 acres of foraging habitat be maintained in undisturbed habitat condition for each pair or unpaired burrowing owl.
 - No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.

- 2. Design and implement project activities to seasonally avoid negative impacts and disturbances to burrowing owls.
 - Occupied burrows should not be disturbed during the nesting period, from March 1st through August 1st.
 - No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.
 - When destruction of burrows is unavoidable, burrow destruction or ground disturbing activities should only occur during the season when migratory owls have left the breeding site. The unoccupied season can be expected to begin in September or October and end in February or March. However, burrowing owl occupancy always must be confirmed by survey data, regardless of season. Immediately prior to burrow destruction a video probe should be used to confirm that the burrow is unoccupied.
 - For any occupied burrows that are destroyed outside of the nesting season, any remaining, undestroyed, burrows should be enhanced (enlarged or cleared of debris) or new burrows should be created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site. A minimum of 6.5 acres of foraging habitat should be maintained in an undisturbed habitat condition for each pair or unpaired resident bird.
 - To ensure compliance with the federal Migratory Bird Treaty Act and state laws and regulations, the U.S. Fish and Wildlife Service and New Mexico Department of Game and Fish must be contacted to confirm that any construction activities resulting in destruction of burrows will not result in a taking of burrowing owls and, thus, violation of federal and state law.
- 3. Relocate burrowing owls that will be negatively impacted by project activities to protected areas of potential burrowing owl habitat.
 - If owls must be moved away from the disturbance area, passive relocation techniques should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and to allow the owls to acclimate to alternate burrows. Passive relocation can be accomplished by use of one-way doors. Owls should be excluded from burrows in the immediate negatively impacted zone and within a 50-m buffer zone by installing one-way doors in burrow entrances. One-way doors should be left in place for approximately 48 hours to ensure that owls have left burrows before excavation. Prior to burrow destruction a video probe should be used to confirm that the burrow is unoccupied. If a video probe is not available burrows should be excavated with hand tools to ensure that the burrows are unoccupied. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. Passive relocation should only be used during the non-breeding season,. This method should not be used once a pair of owls is at a burrow unless it is determined that the female does not exhibit a brood patch.
 - If removal or relocation is necessary, trapped burrowing owls should be released in a new location with suitable habitat in a soft release cage. Soft release involves placing owls in a cage with an artificial burrow and fed mice daily for three weeks. After three weeks one side of the cage is removed. More information on this technique is available from NMBOWG.
 - A minimum of 6.5 acres of foraging habitat should be maintained in an undisturbed habitat condition for each pair or unpaired resident bird. No disturbance or destruction of any prairie dogs or other burrowing animals or their burrows, should occur within the owl avoidance areas.
 - To ensure compliance with the federal Migratory Bird Treaty Act and state laws and regulations, the U.S. Fish and Wildlife Service (505-248-7882) and New Mexico Department of Game and Fish (505-476-8101) must be contacted and federal and state permits must be obtained for handling of owls.

Links

- New Mexico Burrowing Owl Working Group http://www.hawksaloft.org/BUOW/BUOW.htm
- Use of Artificial Burrows by Burrowing Owls at the HAMMER Facility on the U.S. Dept. of Energy Hanford Site http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15414.pdf
- How to Install Artificial Nesting Burrows for Burrowing Owls http://www.usga.org/turf/articles/environment/general/Burrowing-Owl-Brochure.pdf
- Artificial Burrowing Owl Burrow Design http://www2.ucsc.edu/scpbrg/artifici.htm

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