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

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

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

Form C-141 Revised October 10, 2003

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

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

						OPER	ATOR		☐ Init	ial Report	X	Final Report
Name of C	ompany	CrownQues	st Operati	ng. LLC			Kent Crabtree					
		310 Midland					No. 432-556-0'	770				
		-215, State 2	<del></del>			Facility Typ						
Surface Ov	vner Sta	te of New M	lexico	Mineral (	)wner				Lease N	No.	<del></del>	
				LOCA	ATIO	N OF RE	LEASE					
Unit Letter P	Section 27	Township 14S	Range 32E	Feet from the	Nort	h/South Line	Feet from the	East/W	Vest Line	County Lea		
	1		Latitue	de 33 04' 12.12	-		Longitude 10	3 41' 5'	7.76"Wes	<u>st</u>		
	NATURE OF RELEASE											
Type of Rele	ease Produc	ced Water/Cru	ide Oil			Volume of Unknown	Release		Volume I Unknown	Recovered		
Source of Re	elease Daily	y Operations	at Facility				Hour of Occurrence	re.		Hour of Disc	overv	
55445		y operations.				Unknown			Unknown		0101	
Was Immedi	ate Notice (					If YES, To	Whom?					
		Y	res $\square$ 1	No 🛛 Not Requ	iired							
By Whom?						Date and I						
Was a Watercourse Reached?  ☐ Yes ☒ No					If YES, Vo	olume Impacting t	the Wate	rcourse.				
		<u> </u>	_	_								
If a Waterco	urse was Im	pacted, Descr	ibe Fully.	<b>k</b>								
Describe Ca	use of Probl	em and Reme	dial Actio	n Taken: Circulat	ing pur	mp has been re	paired and location	on is beir	ng delineat	ed.		
Describe Ar	ea Affected	and Cleanup	Action Ta	aken. Release im	pacted	an area measi	aring approximate	ely 135 f	eet by 45	feet. Site was	s reme	ediated as per
							my knowledge a					
regulations a	all operators	are required	to report	and/or file certai	n relea	se notification	s and perform co	orrective	actions fo	r releases, w	hich n	nay endanger
							marked as "Fina					
							tion that pose a the elieve the operate					
federal, state	e, or local lay	ws and/or regi	ulations.	eptance of a C-1	41 teb	off does not i	eneve the operation	or res	ponsionity	ioi compiia	nce w	illi aliy olilei
	2						OIL CON	SERV	ATION	DIVISIO	N	
	_/_	///					ENV ENVINE		2111011	DIVIDIO	<u></u>	
Signature:	Sul	Trade	the Contract of the Contract o	<del>5</del>		Approved by	District Supervis	or:				
Printed Nam	e: Kent Cral	btree						IP,	est flag	1 Lalpin		
Title: Foren	nan					Approval Da	te: 09/04/09		Expiration	()	3	· · · · · · · · · · · · · · · · · · ·
							•	<del>V   -</del>	F30-011		-	
E-mail Addr	ess. kcrabtr	ee@crownque	est.com			Conditions of Approval.						
Date: $9-3$	5-09		Phone:	432-556-0770						1RP	-2	188

RECEIVED

SER U 3 ZUUY

HOBBSOCD

# Basin Environmental Consulting, LLC

2800 Plains Highway P. O. Box 381 Lovington, New Mexico 88260 cstanley@basin-consulting.com

Office: (575) 396-2378

Project Manager

Fax: (575) 396-1429



#### REMEDIATION SUMMARY AND RECEIVED RISK-BASED SITE CLOSURE REQUEST SET U 3 2009 HOBBSOCD

**CROWNQUEST OPERATING, LLC** SWD-215, State 27 No. 2 SWD Lea County, New Mexico UNIT "P" (SE/SE), Section 27, Township 14 South, Range 32 East Latitude 32° 04' 12.12" North, Longitude 103° 41' 57.76" West NMOCD Reference # 1RP-2188

Prepared For:

CrownQuest Operating, LLC P.O. Box 53310 Midland, Texas 79710

Prepared By: Basin Environmental Consulting, LLC

August 2009

NMCCD-Holfra

Project Manager

#### TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND INFORMATION
NMOCD SITE CLASSIFICATION1
SUMMARY OF FIELD ACTIVITIES
SITE CLOSURE REQUEST
LIMITATIONS
DISTRIBUTION5
FIGURES
Figure 1 – Site Location Map Figure 2 – Site and Sample Location Map
TABLES
Table 1 – Concentrations of BTEX, TPH and Chloride in Soil
APPENDICES
Appendix A - New Mexico State Land Office Correspondence Appendix B - Laboratory Reports

Appendix D - Release Notification and Corrective Action (Form C-141)

Appendix C - Photographs

#### INTRODUCTION AND BACKGROUND INFORMATION

Basin Environmental Consulting, LLC (Basin), on behalf of CrownQuest Operating, LLC. (CrownQuest), has prepared this Remediation Summary and Risk-Based Site Closure Request for the release site known as SWD-215, State 27 No. 2 SWD. The legal description of the release site is Unit Letter "P" (SE ¼ SE ¼), Section 27, Township 14 South, Range 32 East, in Lea County, New Mexico. The property affected by the release is owned by The State of New Mexico and is administered by the New Mexico State Land Office (NMSLO). The release site is utilized as an active salt water disposal facility (SWD). The release site GPS coordinates are 32.04 12.12" North and 103° 41' 57.76" West. Please reference Figure 1 for a Site Location Map and Figure 2 for a Site and Sample Location Map. General site photographs are provided as Appendix C and the Release Notification and Corrective Action is included as Appendix D.

On December 31, 2008, EnerQuest Oil & Gas Ltd. (EnerQuest), the previous operator of the SWD-215, State 27 No. 2 SWD facility, received correspondence from the NMSLO indicating a NMSLO field inspector observed evidence of a "Spill or stained soils on or adjacent to the pad". A copy of the NMSLO correspondence is provided as Appendix A.

On March 20, 2009, CrownQuest, the current operator of the facility, received the NMSLO correspondence.

On May 19, 2009, CrownQuest submitted a Release Notification and Corrective Action (Form C-141) to the NMOCD Hobbs District Office. The release was of an unknown volume of crude oil and produced water and is likely the result of daily operations within the facility. A leaking circulating pump was identified and repaired. The release(s) was/were contained within the secondary containment berms of the facility. The resulting surface stain attributed to the release(s) measured approximately 45 feet in width and 135 feet in length.

#### NMOCD SITE CLASSIFICATION

According to data obtained from the New Mexico Office of the State Engineer (NMOSE), three (3) water wells are recorded in Section 27 of the above referenced township. According to the NMOSE database, groundwater should be encountered at approximately 175 below ground surface (bgs). The depth to groundwater in this area results in a score of zero (0) being assigned to the site based on the NMOCD depth to groundwater criteria.

The water well database, maintained by the NMOSE, indicated there are no water wells less than 1,000 feet from the release, resulting in zero (0) points being assigned to this site as a result of this criteria.

There is no surface water body located within 1,000 feet of the site. Based on the NMOCD ranking system zero (0) points will be assigned to the site as a result of the criteria.

The NMOCD guidelines indicate the SWD-215, State 27 No. 2 SWD release site has a ranking score of zero (0). Based on this score, the soil remediation levels for a site with a ranking score of zero (0) points are as follows:

- Benzene 10 mg/Kg (ppm)
- BTEX 50 mg/Kg (ppm)
- TPH 5,000 mg/Kg (ppm)

#### SUMMARY OF FIELD ACTIVITIES

On April, 8, 2009, four (4) soil investigation trenches were excavated at the release site to provide vertical and horizontal delineation of the impacted soil. The soil investigation trenches were positioned to the south of the 500 barrel tank (Trench 1), at the south end of the battery (Trench 2), north of the 270 barrel tank (Trench 3) and at the northwest end of the battery (Trench 4). The soil investigation trenches were terminated at approximately one and a half (1.5) feet bgs and backfilled. A hard calcified sandstone underlies the facility at approximately one (1) to one and a half (1.5) feet bgs. Analytical results are summarized in Table 1, Concentrations of TPH, BEX and Chloride in Soil. Analytical reports are provided as Appendix B.

Soil investigation Trench 1 was excavated to a depth of approximately one (1) foot bgs. Laboratory analytical results of the collected soil samples from Trench 1 (Trench 1 @ Surface and Trench 1 @ 1') indicated total petroleum hydrocarbon (TPH) concentrations ranged from 3,316 mg/Kg in soil sample Trench 1 @ 1' to 3,749 mg/Kg in soil sample Trench 1 @ Surface. The analytical results indicated TPH concentrations were less than the NMOCD regulatory standard. Chloride concentrations ranged from 1,210 mg/Kg in soil sample Trench 1 @ 1' to 11,900 mg/Kg in soil sample Trench 1 @ Surface.

Soil investigation Trench 2 was excavated to a depth of approximately one and one half (1.5) feet bgs. Laboratory analytical results of the collected soil samples from Trench 2 (Trench 2 @ Surface and Trench 2 @ 1.5') indicated TPH concentrations ranged from 3,099 mg/Kg in soil sample Trench 2 @ 1.5' to 3,541.9 mg/Kg in soil sample Trench 2 @ Surface. Chloride concentrations ranged from 27.3 mg/Kg in soil sample Trench 2 @ Surface to 32.6 mg/Kg in soil sample Trench 1 @ 1.5'. The analytical results indicated TPH and chloride concentrations were less than the NMOCD regulatory standard.

Soil investigation Trench 3 was excavated to a depth of approximately fourteen (14) inches bgs. Laboratory analytical results of the collected soil sample from Trench 3 (Trench 3 @ 14") indicated the TPH concentration was 621.6 mg/Kg and the chloride concentration was 127 mg/Kg. The analytical results indicated TPH and chloride concentrations were less than the NMOCD regulatory standard.

Soil investigation Trench 4 was excavated to a depth of approximately one (1) foot bgs. Laboratory analytical results of the collected soil samples from Trench 4 (Trench 4 @ Surface and Trench 4 @ 1') indicated TPH concentrations ranged from 62.7 mg/Kg in soil sample Trench 4 @ Surface. Chloride concentrations ranged from 652 mg/Kg in soil sample Trench 4 @ Surface to 1,450 mg/Kg in soil sample Trench 4 @ 1'. The analytical results indicated TPH concentrations were less than the NMOCD regulatory standard.

On April 29, 2009, the NMOCD Hobbs District Office approved limited excavation of the release site to approximately one (1) foot bgs. Following the excavation activities, soil samples were to be collected and submitted to the laboratory for analysis.

In June 26, 2009, excavation activities began at the release site. Excavated soil was stockpiled pending transportation to an NMOCD approved landfill.

On June 30, 2009, three (3) confirmation soil samples (North Area, Center Area, and South Area) were collected from the floor of the excavation and submitted to the laboratory for analysis. The analytical results indicated benzene concentrations were less than the laboratory method detection limit (MDL) of 0.01 mg/Kg. The results further indicated benzene, toluene, ethylbenzene and xylene (BTEX) concentrations ranged from less than the laboratory MDL of 0.01 mg/Kg in soil samples "Center Area" and "South Area" to 0.486 mg/Kg in soil sample "North Area". TPH concentrations ranged from 8.95 mg/Kg in soil sample "South Area" to 480.24 mg/Kg in soil sample "North Area". Chloride concentrations ranged from 14.2 mg/Kg in soil sample "South Area" to 3,570 mg/Kg in soil sample "North Area".

Following excavation and sampling activities, approximately 208 cubic yards (cy) of excavated soil was transported to the Gandy Marley Landfill (Permit #NM-01-0019). The site was backfilled with non-impacted caliche purchased from a NMSLO caliche pit. Remediation activities were completed on July 1, 2009.

#### RISK-BASED SITE CLOSURE REQUEST

Based on the analytical results of confirmation soil samples, Basin recommends CrownQuest provide the NMOCD Hobbs District Office and the NMSLO, a copy of this Remediation Summary and Risk-Based Site Closure Request and request the NMOCD and NMSLO grant site closure to the SWD-215, State 27 No. 2 SWD release site. Additional soil remediation activities, if warranted will be completed at time of abandonment of the facility.

#### **LIMITATIONS**

Basin Environmental Consulting, LLC has prepared this Remediation Summary and Risk-Based Site Closure Request to the best of its ability. No other warranty, expressed or implied, is made or intended.

Basin Environmental Consulting, LLC has examined and relied upon documents referenced in the report and has relied on oral statements made by certain individuals. Basin Environmental Consulting, LLC has not conducted an independent examination of the facts contained in referenced materials and statements. We have presumed the genuineness of the documents and that the information provided in documents or statements is true and accurate. Basin Environmental Consulting, LLC has prepared this report, in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Basin Environmental Consulting, LLC also notes that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of CrownQuest Operating, LLC. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of Basin Environmental Consulting, LLC and/or CrownQuest Operating, LLC.

#### **DISTRIBUTION:**

Copy 1: Larry Johnson

New Mexico Energy, Minerals and Natural Resources Department

Oil Conservation Division (District 1)

1625 French Drive

Hobbs, New Mexico 88240

Copy 2: Thaddeus Kostrubala

New Mexico State Land Office

310 Old Santa Fe Trail

P.O. Box 1148

Santa Fe, New Mexico 87504

Copy 3: Don Rogers

CrownQuest Operating, LLC

P.O. Box 53310

Midland, Texas 79710

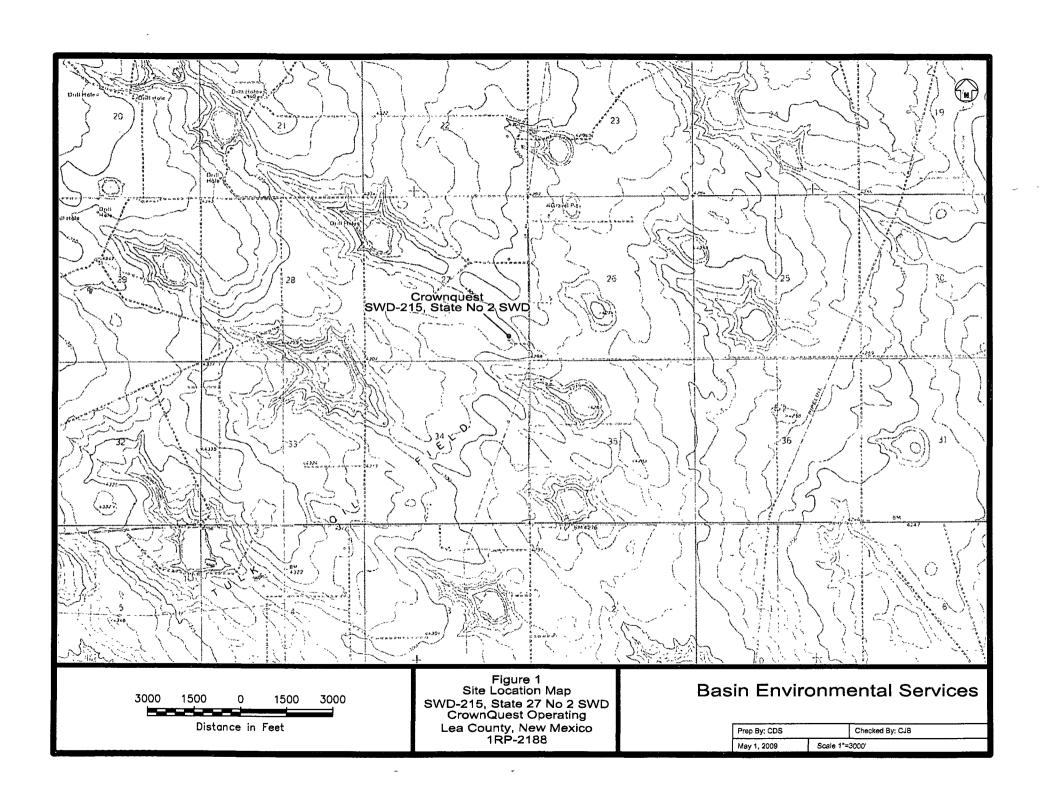
Copy 4: Curt D. Stanley

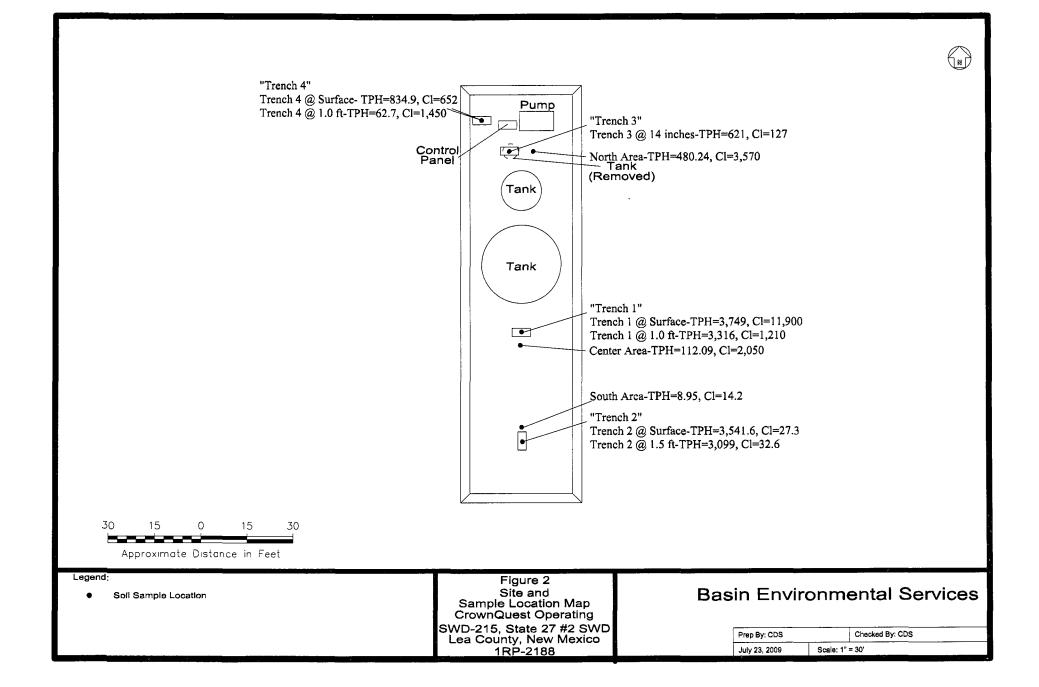
Basin Environmental Consulting, LLC

P.O. Box 381

Lovington, New Mexico 88260 cdstanley@basin-consulting.com

Figures





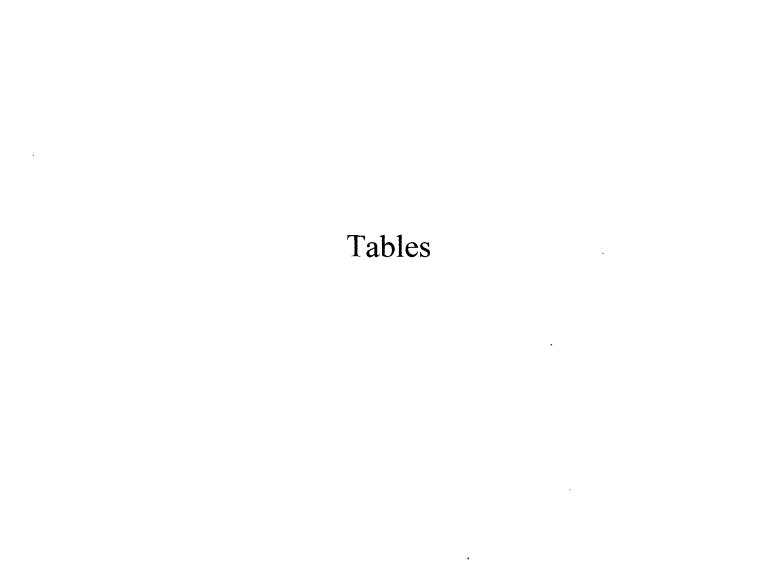


Table 1

# CONCENTRATIONS OF TPH, BTEX AND CHLORIDE IN SOIL CROWNQUEST OPERATING, LLC SWD-215, STATE 27 No. 2 SWD LEA COUNTY, NEW MEXICO NMOCD REF # 1RP-2188

					EPA SW 8	346-8021B				EPA SW 846-8	3015	EPA 300
SAMPLE DATE	SAMPLE LOCATION	SAMPLE DEPTH	SOIL STATUS	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	XYLENE (mg/Kg)	BTEX (mg/Kg)	GRO (mg/Kg)	DRO (mg/Kg)	TOTAL TPH (mg/Kg)	Chloride (mg/Kg)
04/08/09	Trench 1 @ Surface	Surface	Excavated	-	-	-	-	-	139	3,610	3,749	11,900
04/08/09	Trench 1 @ 1'	1 Foot	Excavated	-		-	-	-	446	2,870	3,316	1,210
04/08/09	Trench 2 @ Surface	Surface	Excavated	-	-	-	-	-	61.9	3,480	3,541.9	27.3
04/08/09	Trench 2 @ 1.5'	1.5 Feet	Excavated	-	-	-	-	-	329	2,770	3,099 0	32.6
04/08/09	Trench 3 @ 14"	14 Inches	Excavated	,	-	-	-	-	21 6	600	621.6	127
04/08/09	Trench 4 @ Surface	Surface	Excavated	-	-	-	-	-	2.9	832	834.9	652
04/08/09	Trench 4 @ 1'	1 Foot	Excavated	-	-	-	-	-	<1.00	62.7	62.7	1,450
	ACHINE SEA	建筑的建筑		12 M. 1966	マースメンジ			S. W. 16 W.		Q275965.95		
06/30/09	North Area	1.5 Feet	In-Situ	<0.0100	0.115	<0.0100	0.371	0.486	6.24	474	480 24	3,570
06/30/09	Center Area	1.5 Feet	In-Situ	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	2.09	110	112.09	2,050
06/30/09	South Area	1.5 Feet	In-Situ	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	8.95	<50.0	8.95	14 2
	Life Panacia	MAN MA	SALE SALE					数多数数				
NMOC	O CLEAN-UP LEVEL			10				50			5,000	250

BOLD indicates concentration exceeding NMOCD regulatory standards

Appendices

# Appendix A New Mexico State Land Office Correspondence



#### PATRICK H. LYONS COMMISSIONER

# State of New Mexico Commissioner of Public Lands

310 OLD SANTA FE TRAIL. P.O. BOX 1148 SANTA HE, NEW MEXICO 87504-1148 COMMISSIONER'S OFFICE

Phone (505) 827-5760 Fax (505) 827-5766 www.mnstatelands.org

XC Box Rogers -For your handling

December 31, 2008

#### <u>CERTIFIED MAIL.</u> RETURN RECEIPT REQUESTED

lean Hayshp EnerQuest Oil and Gas Ltd 303 W. Wall Avenue, Suite L400 Midland, TX 79702 (432) 818-0319

Renewal of SWD & Environmental Requirements

SWD-215, STATE 27 No. 2 SWD SE% SE% Section 27, T-14-S, R-32-E Lea County, New Mexico

Dear Jean Hayship

1200

It has come to our attention that EnerQuest Oil and Gas Ltd, seeks renewal of the above described saft water disposal easement. Please be aware that a field inspection produced the following documented evidence

Spill or stained soils on or adjacent to the pad

[] Obsolete equipment on the site

The eproblems do not comply with operational requirements set forth in the signed easement and the State Land Office. Rules, 19.2-19.28, and 19.2-100.66. These rules outline requirements for surface operations and reclamation on a State lease or easement.

As the casement holder of record, you have incurred certain obligations which include using "all reasonably no essays safeguards to prevent contamination or pollution of soil, surface waters, and groundwater." To achieve this requirement the easement surface shall be maintained is a "clean" condition, free of stained soils and soills.

The Land Office recommends EnerQuest Oil and Gas Ltd. contact the New Mexico Oil Conservation Division to obtain requirements for the investigation, mitigation, and remediation of stained soils on the easement.

2.83.20 G

You are requested to inspect your casement and report (in writing) within sixty (60) days from the date of this letter of corrective actions taken or planned. If corrective action is planned, indicate the date the action(s) will be taken. Please coordinate your plans and an inspection date with our District Resource Manger, Leon Anderson, whose phone number is (505) 392-8736. If you have any questions, please feel free to contact me at (505) 827-5723

Sim eich

Thaddeus Kostrabala, Assistant Director

Field Operations Division (505) 827-5723

(202) 811-2151

Ce Anna Villa Director Rights-of-Way Division, NMSLO Larry Johnson, District Supervisor NMOCD

Leon Anderson, District Resource Manager, NMSI O

Het was for M. Kostrubola asking what our revised deadline in aince this was received after the lodging opins.

Appendix B Laboratory Reports



67J1 Approeen Avenue, Suire 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1

Lubbock, Toxas 79424 El Paso, Texas 79922

800 • 378 • 1296 888 • 588 • 3443

806 • 794 • 1296 915 • 585 • 3443

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944

0015 Harris Parkway, Suite 110

Midland, Texas 79703 Ft. Worth, Texas 76132 432 • 689 • 6301 817 • 201 • 5260 FAX 432 • 689 • 6313

E-Mail lab@traceanalysis.com

#### Certifications

**WBENC**: 237019

HUB:

1752439743100-86536

**DBE:** VN 20657

**NCTRCA** WFWB38444Y0909

#### **NELAP Certifications**

Lubbock: T104704219-08-TX

LELAP-02003

Kansas E-10317

El Paso: T104704221-08-TX

LELAP-02002

Midland: T104704392-08-TX

## **Analytical and Quality Control Report**

Camille Bryant Basin Environmental Consulting 2800 Plains Hwy. P. O. Box 381 Lovington, NM, 88260

Work Order:

Report Date: April 17, 2009

9040901

Project Location: West of Lovington, NM

Project Name: Project Number:

NM-27 #2 Crownquest

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

			Date	$\operatorname{Time}$	Date
Sample	Description	Matrix	Taken	Taken	Received
192545	Trench 1 @ Surface	soil	2009-04-08	10:30	2009-04-09
192546	Trench 1 @ 1 ft.	soil	2009-04-08	10:50	2009-04-09
192547	Trench 2 @ Surface	soil	2009-04-08	11:10	2009-04-09
192548	Trench 2 @ 1.5 ft.	soil	2009-04-08	11:30	2009-04-09
192549	Trench 3 @ 14 in.	soil	2009-04-08	11:50	2009-04-09
192550	Trench 4 @ Surface	soil	2009-04-08	12:30	2009-04-09
192551	Trench 4 @ 1 ft.	soil	2009-04-08	12:50	2009-04-09

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

Dr. Blair Leftwich, Director

#### Standard Flags

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

#### Case Narrative

Samples for project NM-27 #2 were received by TraceAnalysis, Inc. on 2009-04-09 and assigned to work order 9040901. Samples for work order 9040901 were received intact at a temperature of 3.1 deg. C.

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

		$\operatorname{Prep}$	$\operatorname{Prep}$	$_{ m QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	49972	2009-04-14 at 09:37	58636	2009-04-16 at 15:33
TPH DRO	Mod. 8015B	49892	2009-04-10 at 08:04	58418	2009-04-09 at 15:15
TPH DRO	Mod. 8015B	49907	2009-04-10 at 13:00	58460	2009-04-10 at 14:30
TPH GRO	S 8015B	49921	2009-04-10 at 09:37	58458	2009-04-10 at 09:37

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 9040901 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Report Date: April 17, 2009 Work Order: 9040901 Page Number: 4 of 17 Crownquest NM-27 #2 West of Lovington, NM

### **Analytical Report**

#### Sample: 192545 - Trench 1 @ Surface

Laboratory: Midland

Analysis: Chloride (IC)
QC Batch: 58636
Prep Batch: 49972

Analytical Method: E 300.0 Date Analyzed: 2009-04-16 Sample Preparation: 2009-04-14

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

RL Parameter Flag Result

 Result
 Units

 11900
 mg/Kg

 nits
 Dilution
 RL

 /Kg
 1000
 1.00

#### Sample: 192545 - Trench 1 @ Surface

Laboratory: Midland

Chloride

DRO

Analysis: TPH DRO QC Batch: 58418 Prep Batch: 49892 Analytical Method: Mod. 8015B Date Analyzed: 2009-04-09 Sample Preparation: 2009-04-10

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

 $\begin{array}{ccc} & & & RL \\ Parameter & Flag & Result \end{array}$ 

 Result
 Units
 Dilution
 RL

 3610
 mg/Kg
 5
 50.0

					Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontane	1	774	mg/Kg	5	100	774	13.2 - 219.3

#### Sample: 192545 - Trench 1 @ Surface

Laboratory: Midland

Analysis: TPH GRO QC Batch: 58458 Prep Batch: 49921 Analytical Method: S 8015B Date Analyzed: 2009-04-10 Sample Preparation: 2009-04-10

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

GRO	riag	139		10	1.00
Parameter	Flag	Result	Units	Dilution	RL

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	* ****	18.9	mg/Kg	10	20.0	94	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		20.3	mg/Kg	10	20.0	102	52 - 117

<sup>&</sup>lt;sup>1</sup>High surrogate recovery due to peak interference.

Crownquest

Work Order: 9040901 NM-27 #2

Page Number: 5 of 17 West of Lovington, NM

Sample: 192546 - Trench 1 @ 1 ft.

Laboratory:

Midland

Analysis: QC Batch:

Chloride (IC) 58636 Prep Batch: 49972

Analytical Method: Date Analyzed:

Sample Preparation:

E 300.0

2009-04-16 2009-04-14

N/A Prep Method: Analyzed By: AR

Prepared By: AR

RL

Parameter Chloride

Flag

Result 1210

Units mg/Kg Dilution 100

RL1.00

Sample: 192546 - Trench 1 @ 1 ft.

Laboratory:

Midland

Analysis: QC Batch:

Prep Batch:

TPH DRO 58418 49892

Analytical Method: Date Analyzed:

Result

387

Flag

3

Mod. 8015B 2009-04-09 2009-04-10

Prep Method: N/A Analyzed By: LD

Prepared By:

LD

RL

Sample Preparation:

Parameter DRO

Result 2870 Units

100

Dilution

387

RL

Flag

mg/Kg

5

50.0

Surrogate n-Triacontane

Flag

Units

mg/Kg

Dilution

5

Spike Percent Amount Recovery

Recovery Limits 13.2 - 219.3

Sample: 192546 - Trench 1 @ 1 ft.

Laboratory:

Midland

Analysis: QC Batch: Prep Batch:

TPH GRO 58458 49921

Analytical Method: Date Analyzed:

Sample Preparation:

Units

mg/Kg

mg/Kg

S 8015B 2009-04-10 2009-04-10 Prep Method: S 5035 Analyzed By: ME

RL

Parameter Flag Result

Result

18.9

27.7

Prepared By:

ME

1.00

GRO

446

Units mg/Kg

Dilution

10

10

Dilution 10

Percent

Recovery

94

138

Spike

Amount

20.0

20.0

RL

Recovery

Limits

68.5 - 119.4

52 - 117

Surrogate Trifluorotoluene (TFT)

4-Bromofluorobenzene (4-BFB) <sup>2</sup>High surrogate recovery due to peak interference.

<sup>3</sup>High surrogate recovery due to peak interference.

Report Date: April 17, 2009 Work Order: 9040901 Page Number: 6 of 17 Crownquest NM-27 #2 West of Lovington, NM

#### Sample: 192547 - Trench 2 @ Surface

Laboratory: Midland

Analysis: Chloride (IC) QC Batch: 58636 Prep Batch: 49972

Analytical Method: E 300.0 Date Analyzed: 2009-04-16 Sample Preparation: 2009-04-14

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

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		27.3	mg/Kg	5	1.00

#### Sample: 192547 - Trench 2 @ Surface

Laboratory: Midland

TPH DRO Analysis: QC Batch: 58418Prep Batch: 49892

Analytical Method: Mod. 8015B Date Analyzed: 2009-04-09 Sample Preparation: 2009-04-10

Prep Method: N/A Analyzed By: LDPrepared By: LD

		$\mathrm{RL}$			
Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
DRO		3480	mg/Kg	5	50.0

					$\mathbf{S}_{\mathbf{P}}$ ike	Percent	Recovery
Surrogate	$\mathbf{Flag}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontane	4	441	mg/Kg	5	100	441	13.2 - 219.3

#### Sample: 192547 - Trench 2 @ Surface

Midland Laboratory:

Analysis: TPH GRO QC Batch: 58458 Prep Batch: 49921

Analytical Method: S 8015B Date Analyzed: 2009-04-10 Sample Preparation: 2009-04-10

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

Parameter	Flag	Result	Units	Dilution	RL
GRO		61.6	mg/Kg	5	1.00

RL

Surrogate	Flag	Result	Units	Dilution	$egin{array}{c} \mathbf{Spike} \ \mathbf{Amount} \end{array}$	Percent Recovery	$egin{array}{c}  ext{Recovery} \  ext{Limits} \end{array}$
Trifluorotoluene (TFT)		9.47	mg/Kg	5	10.0	95	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		9.03	${ m mg/Kg}$	5	10.0	90	52 - 117

<sup>&</sup>lt;sup>4</sup>High surrogate recovery due to peak interference.

Work Order: 9040901 Page Number: 7 of 17 Report Date: April 17, 2009 NM-27 #2 West of Lovington, NM Crownquest

#### Sample: 192548 - Trench 2 @ 1.5 ft.

Laboratory: Midland

Analysis: Chloride (IC) QC Batch: 58636 Prep Batch: 49972

Analytical Method: Date Analyzed: Sample Preparation:

E 300.0 2009-04-16 2009-04-14 Prep Method: N/A Analyzed By: ARPrepared By: AR

RL

RL

Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
Chloride		32.6	mg/Kg	5 -	1.00

#### Sample: 192548 - Trench 2 @ 1.5 ft.

Laboratory: Midland

TPH DRO Analysis: QC Batch: 58418 Prep Batch: 49892

Analytical Method: Mod. 8015B Date Analyzed: 2009-04-09 Sample Preparation: 2009-04-10

Prep Method: N/A Analyzed By: LDPrepared By: LD

Parameter Flag Result  $\overline{\mathrm{DRO}}$ 2770

Dilution RLUnits 50.0 mg/Kg

					Spike	Percent	Recovery
Surrogate	$\mathbf{Flag}$	Result	Units	Dilution	${f Amount}$	Recovery	Limits
n-Triacontane	5	348	mg/Kg	5	100	348	13.2 - 219.3

#### Sample: 192548 - Trench 2 @ 1.5 ft.

Laboratory: Midland

TPH GRO Analysis: QC Batch: 58458 Prep Batch: 49921

Analytical Method: S 8015B Date Analyzed: 2009-04-10 Sample Preparation: 2009-04-10

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

RLResult Dilution Parameter Flag Units RLGRO 329 mg/Kg5 1.00

Surrogate	Flag	Result	Units	Dilution	$egin{array}{c} \mathbf{Spike} \ \mathbf{Amount} \end{array}$	Percent Recovery	$egin{array}{c}  ext{Recovery} \  ext{Limits} \end{array}$
Trifluorotoluene (TFT)		9.53	mg/Kg	5	10.0	95	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)	6	18.3	mg/Kg	5	10.0	183	52 - 117

<sup>&</sup>lt;sup>5</sup>High surrogate recovery due to peak interference.

<sup>&</sup>lt;sup>6</sup>High surrogate recovery due to peak interference.

Report Date: April 17, 2009 Work Order: 9040901 Page Number: 8 of 17 Crownquest NM-27 #2 West of Lovington, NM

Sample	192549	- Trench	3 @ 14 in.	
Sample.	104040	- 11611611	J & 14 III.	

$_{ m Lal}$	boratory:	Midland

Analysis: Chloride (IC)
QC Batch: 58636
Prep Batch: 49972

Analytical Method: E 300.0 Date Analyzed: 2009-04-16 Sample Preparation: 2009-04-14

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

#### RL

RL

Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
Chloride		127	mg/Kg	5	1.00

#### Sample: 192549 - Trench 3 @ 14 in.

Laboratory: Midland

Analysis: TPH DRO QC Batch: 58418 Prep Batch: 49892 Analytical Method: Mod. 8015B Date Analyzed: 2009-04-09 Sample Preparation: 2009-04-10 Prep Method: N/A Analyzed By: LD Prepared By: LD

normaton Flor D

Parameter Flag Result DRO 600

Units	Dilution	RL
mg/Kg	5	50.0

					Spike	Percent	Recovery
Surrogate	$\mathbf{Flag}$	Result	Units	Dilution	${f Amount}$	Recovery	Limits
n-Triacontane	7	556	mg/Kg	5	100	556	13.2 - 219.3

#### Sample: 192549 - Trench 3 @ 14 in.

Laboratory: Midland

Analysis: TPH GRO QC Batch: 58458 Prep Batch: 49921 Analytical Method: S 8015B Date Analyzed: 2009-04-10 Sample Preparation: 2009-04-10

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

RL

Parameter	Flag	Result	Units	Dilution	RL
GRO		21.6	mg/Kg	2	1.00

Surrogate	Flag	Result	Units	Dilution	$\begin{array}{c} {\rm Spike} \\ {\rm Amount} \end{array}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		3.73	mg/Kg	2	4.00	93	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		3.47	$_{ m mg/Kg}$	2	4.00	87	52 - 117

<sup>&</sup>lt;sup>7</sup>High surrogate recovery due to peak interference.

Report Date: April 17, 2009 Crownquest

Work Order: 9040901 NM-27 #2

Page Number: 9 of 17 West of Lovington, NM

Laboratory:

Prep Batch:

Midland

Analysis: QC Batch:

Chloride (IC) 58636 49972

Analytical Method: Date Analyzed:

Sample Preparation:

E 300.0

2009-04-16 2009-04-14 Prep Method: N/A Analyzed By:

ARPrepared By: AR

1.00

RL

Parameter Chloride

Result Flag 652

Units Dilution mg/Kg 5

RL

#### Sample: 192550 - Trench 4 @ Surface

Laboratory:

Midland

Analysis: TPH DRO QC Batch: 58418 49892 Prep Batch:

Analytical Method: Date Analyzed: Sample Preparation:

Mod. 8015B 2009-04-09 2009-04-10

Prep Method: N/A Analyzed By: LD

Prepared By: LD

RL

Dilution RLParameter Flag Result Units  $\overline{\mathrm{DRO}}$ 832 mg/Kg 5 50.0

					$\mathbf{Spike}$	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontane	8	711	mg/Kg	5	100	711	13.2 - 219.3

#### Sample: 192550 - Trench 4 @ Surface

Laboratory:

Midland

Analysis: TPH GRO QC Batch: 58458 Prep Batch: 49921

Analytical Method: Date Analyzed: Sample Preparation:

S 8015B 2009-04-10 2009-04-10

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

RL

Result Dilution Parameter Flag Units RL2.90 1.00  $\overline{\text{GRO}}$ mg/Kg

Surrogate	Flag	Result	Units	Dilution	$egin{array}{c} \mathbf{Spike} \\ \mathbf{Amount} \end{array}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	0	1.84	mg/Kg	1	2.00	92	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		1.47	${ m mg/Kg}$	1	2.00	74	52 - 117

<sup>&</sup>lt;sup>8</sup>High surrogate recovery due to peak interference.

Work Order: 9040901 Report Date: April 17, 2009

Page Number: 10 of 17 NM-27 #2 West of Lovington, NM Crownquest

Sample: 192551 - Trench 4 @ 1 ft.

Midland Laboratory:

Prep Method: N/A Analysis: Chloride (IC) Analytical Method: E 300.0 QC Batch: 58636 Date Analyzed: 2009-04-16 Analyzed By: ARPrep Batch: 49972 Prepared By: ARSample Preparation: 2009-04-14

RL

Parameter Result Units Dilution RLFlag 1.00 Chloride 1450 mg/Kg 100

Sample: 192551 - Trench 4 @ 1 ft.

Laboratory: Midland

Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A QC Batch: 58460 Date Analyzed: 2009-04-10 Analyzed By: LD49907 Prepared By: LDPrep Batch: Sample Preparation: 2009-04-10

RL

Parameter Result Units Dilution RLFlag  $\overline{\mathrm{DRO}}$ 62.7 50.0 mg/Kg

					Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	Units	Dilution	${f Amount}$	Recovery	Limits
n-Triacontane		157	mg/Kg	1	100	157	13.2 - 219.3

Sample: 192551 - Trench 4 @ 1 ft.

Laboratory: Midland

Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5035 QC Batch: 58458ME Date Analyzed: 2009-04-10 Analyzed By: Prep Batch: 49921 Sample Preparation: 2009-04-10 Prepared By: ME

		$\mathrm{RL}$			
Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	1	1.00
		· · · · · · · · · · · · · · · · · · ·		0 11 D 4	D .

Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.00	mg/Kg	1	2.00	100	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		1.52	${ m mg/Kg}$	1	2.00	76	52 - 117

Crownquest NM-27 #2 West of Lovington, NM Method Blank (1) QC Batch: 58418 QC Batch: 2009-04-09 Analyzed By: LD 58418 Date Analyzed: 49892 Prepared By: LDPrep Batch: QC Preparation: 2009-04-10 MDL Flag Parameter Result Units RL $\overline{\mathrm{DRO}}$ 7.12mg/Kg 50 Spike Percent Recovery Flag Units Amount Surrogate Result Dilution Recovery Limits n-Triacontane 110 mg/Kg 100 110 13 - 178.5 Method Blank (1) QC Batch: 58458 QC Batch: 58458 Date Analyzed: 2009-04-10 Analyzed By: ME Prep Batch: 49921 QC Preparation: 2009-04-10 Prepared By: ME MDL Flag Parameter Result Units RLGRO < 0.482 mg/Kg Spike Percent Recovery Surrogate Dilution Flag Result Units Limits Amount Recovery Trifluorotoluene (TFT) 1.89mg/Kg 1 2.00 94 71.9 - 1154-Bromofluorobenzene (4-BFB) 1.60 mg/Kg 1 2.00 80 45.7 - 118.9 Method Blank (1) QC Batch: 58460 QC Batch: 58460 Date Analyzed: 2009-04-10 Analyzed By: LD Prep Batch: 49907 QC Preparation: 2009-04-10 Prepared By: LD MDL Parameter Flag Result Units RL $\overline{\text{DRO}}$ < 5.86 mg/Kg 50 Spike Percent Recovery Surrogate Flag Result Units Dilution Amount Limits Recovery n-Triacontane 90.4 100 mg/Kg 1 90 13 - 178.5 Matrix Blank (1) QC Batch: 58636

Date Analyzed:

QC Preparation:

2009-04-16

2009-04-14

Work Order: 9040901

Page Number: 11 of 17

Analyzed By: AR

AR

Prepared By:

Report Date: April 17, 2009

QC Batch:

Prep Batch: 49972

58636

Work Order: 9040901 NM-27 #2

Page Number: 12 of 17

Crownquest

West of Lovington, NM

		MDL		
Parameter	$\operatorname{Flag}$	$\operatorname{Result}$	${f Units}$	RL
Chloride		1.20	mg/kg	1

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

QC Batch:

58418

Date Analyzed:

2009-04-09

Analyzed By: LD

Prep Batch: 49892

QC Preparation: 2009-04-10

Prepared By: LD

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	263	mg/Kg	1	250	7.12	102	57.4 - 133.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	275	mg/Kg	1	250	7.12	107	57.4 - 133.4	4	20

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

	$_{ m LCS}$	$_{ m LCSD}$			Spike	$_{ m LCS}$	$_{ m LCSD}$	Rec.
Surrogate	Result	Result	${ m Units}$	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Triacontane	96.8	97.2	mg/Kg	1	100	97	97	48.5 - 146.7

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

QC Batch:

Date Analyzed: 2009-04-10

Analyzed By: ME

Prep Batch: 49921

QC Preparation: 2009-04-10

Prepared By: ME

	LCS			$\mathbf{Spike}$	Matrix		Rec.
Param	Result	${ m Units}$	Dil.	Amount	Result	Rec.	${f Limit}$
GRO	18.2	mg/Kg	1	20.0	< 0.482	91	60.5 - 100.1

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$\mathbf{Limit}$
GRO	17.7	mg/Kg	1	20.0	< 0.482	88	60.5 - 100.1	3	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.03	1.95	mg/Kg	1	2.00	102	98	78.8 - 104.7
4-Bromofluorobenzene (4-BFB)	1.78	1.77	mg/Kg	1	2.00	89	88	66.1 - 107.3

Crownquest

Work Order: 9040901 NM-27 #2

Page Number: 13 of 17 West of Lovington, NM

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:

58460 49907

Date Analyzed:

2009-04-10

QC Preparation: 2009-04-10 Analyzed By: LD Prepared By: LD

LCS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit DRO 250< 5.86 77 57.4 - 133.4 192 mg/Kg

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	$\operatorname{Limit}$
DRO	207	mg/Kg	1	250	< 5.86	83	57.4 - 133.4	8	20

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

	LCS	LCSD			$\mathbf{Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	$\mathbf{Units}$	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Triacontane	81.0	81.2	mg/Kg	1	100	81	81	48.5 - 146.7

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

QC Batch:

Prep Batch: 49972

Date Analyzed: QC Preparation:

2009-04-16 2009-04-14 Analyzed By: AR

Prepared By:

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	${f Amount}$	Result	Rec.	${f Limit}$
Chloride	11.7	mg/Kg	1	12.5	< 0.0430	94	90 - 110

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	${f Amount}$	Result	Rec.	$\mathbf{Limit}$	RPD	$\operatorname{Limit}$
Chloride	12.0	mg/Kg	1	12.5	< 0.0430	96	90 - 110	2	

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

Matrix Spike (MS-1)

QC Batch: 58418 Prep Batch: 49892

Spiked Sample: 192545

Date Analyzed: QC Preparation:

2009-04-09 2009-04-10

Analyzed By: LD Prepared By: LD

MS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit DRO 3910 mg/Kg 5 250 3610 120 35.2 - 167.1

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

Crownquest

Work Order: 9040901 NM-27 #2

Page Number: 14 of 17 West of Lovington, NM

		MSD			Spike	Matrix		Rec.		RPD
Param		Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
DRO	9	3000	mg/Kg	5	250	3610	0	35.2 - 167.1	26	20

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

		MS	MSD			$\mathbf{Spike}$	MS	MSD	Rec.
Surrogate		Result	Result	${ m Units}$	Dil.	Amount	Rec.	Rec.	Limit
n-Triacontane	10 11	627	346	mg/Kg	5	100	627	346	34.5 - 178.4

Matrix Spike (MS-1) Spiked Sample: 192551

QC Batch:

58458 Prep Batch: 49921

Date Analyzed: QC Preparation:

2009-04-10 2009-04-10 Analyzed By: ME

Prepared By: ME

	MS			$\mathbf{Spike}$	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	26.6	mg/Kg	1	20.0	< 0.482	133	12.8 - 175.2

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$_{ m Limit}$
GRO	28.3	mg/Kg	1	20.0	< 0.482	142	12.8 - 175.2	6	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)	2.02	2.23	mg/Kg	1	2	101	112	60.8 - 132.1
4-Bromofluorobenzene (4-BFB)	1.61	1.59	mg/Kg	1	2	80	80	31.3 - 161.7

Matrix Spike (MS-1) Spiked Sample: 192551

QC Batch: Prep Batch:

58460 49907 Date Analyzed:

2009-04-10

QC Preparation: 2009-04-10 Analyzed By: LD

Prepared By: LD

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$
DRO	226	mg/Kg	1	250	62.69	65	35.2 - 167.1

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

 $continued \dots$ 

<sup>&</sup>lt;sup>9</sup>Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

<sup>&</sup>lt;sup>10</sup>High surrogate recovery due to peak interference.

<sup>&</sup>lt;sup>11</sup>High surrogate recovery due to peak interference.

Work Order: 9040901 NM-27 #2

Page Number: 15 of 17 West of Lovington, NM

Crownquest

$matrix\ spikes\ continued\ \dots$									
	MSD			$\operatorname{Spike}$	Matrix		$\mathrm{Rec}.$		RPD
Param	Result	$\operatorname{Units}$	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
	MCD			C.:l.o	Motoica		Rec.		RPD
	MSD			$\mathbf{S}$ pike	Matrix				
Param	Result	${ m Units}$	$\mathrm{Dil}$ .	Amount	$\mathbf{Result}$	$\mathrm{Rec}.$	${f Limit}$	RPD	Limit
DRO	261	mg/Kg	1	250	62.69	79	35.2 - 167.1	14	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	Limit
n-Triacontane	153	167	mg/Kg	1	100	153	167	34.5 - 178.4

Matrix Spike (MS-1)

Spiked Sample: 192551

QC Batch: 58636

2009-04-16

Analyzed By: AR Prepared By: AR

Prep Batch: 49972

Date Analyzed: QC Preparation: 2009-04-14

	MS			$\mathbf{Spike}$	Matrix		$\mathrm{Rec}.$
Param	Result	${ m Units}$	Dil.	${f Amount}$	Result	Rec.	${f Limit}$
Chloride	2570	mg/Kg	100	1250	1450	90	90 - 110

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	$_{ m Limit}$
Chloride	2570	mg/Kg	100	1250	1450	90	90 - 110	0	

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

Standard (CCV-1)

QC Batch: 58418

Date Analyzed: 2009-04-09

Analyzed By: LD

			$\overset{ ext{CCVs}}{\overset{ ext{-}}{ ext{-}}}$	CCVs	$_{ m CCVs}$	Percent	_
			$\operatorname{True}$	Found	Percent	Recovery	$\operatorname{Date}$
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	251	100	80 - 120	2009-04-09

Standard (CCV-2)

QC Batch: 58418

Date Analyzed: 2009-04-09

Analyzed By: LD

Report Date: April 17, 2009 Work Order: 9040901 Page Number: 16 of 17
Crownquest NM-27 #2 West of Lovington, NM

			$rac{ ext{CCVs}}{ ext{True}}$	$\begin{array}{c} { m CCVs} \\ { m Found} \end{array}$	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	251	100	80 - 120	2009-04-09

#### Standard (CCV-3)

QC Batch: 58418 Date Analyzed: 2009-04-09 Analyzed By: LD

			CCVs	CCVs	$\mathrm{CCVs}$	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	268	107	80 - 120	2009-04-09

#### Standard (CCV-1)

QC Batch: 58458 Date Analyzed: 2009-04-10 Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			$\operatorname{True}$	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
$\overline{\text{GRO}}$		mg/Kg	1.00	1.01	101	80 - 120	2009-04-10

#### Standard (CCV-2)

QC Batch: 58458 Date Analyzed: 2009-04-10 Analyzed By: ME

			CCVs	CCVs	$\mathrm{CCVs}$	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.18	118	80 - 120	2009-04-10

#### Standard (CCV-2)

QC Batch: 58460 Date Analyzed: 2009-04-10 Analyzed By: LD

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	227	91	80 - 120	2009-04-10

#### Standard (CCV-3)

QC Batch: 58460 Date Analyzed: 2009-04-10 Analyzed By: LD

Report Date: April 17, 2009 Work Order: 9040901 Page Number: 17 of 17 West of Lovington, NM Crownquest NM-27 #2 CCVsCCVsCCVsPercent Date True Found Percent Recovery Analyzed Param Flag Units Conc. Conc. Recovery Limits DRO 259 80 - 120 2009-04-10 mg/Kg 250 104 Standard (ICV-1) QC Batch: 58636 Date Analyzed: 2009-04-16 Analyzed By: AR ICVsICVs**ICVs** Percent True Found Percent Recovery Date Flag Units Analyzed Param Conc. Conc. Recovery Limits  $\overline{\text{Chloride}}$ 12.5 11.3 90 90 - 110 2009-04-16 mg/Kg Standard (CCV-1) QC Batch: 58636 Date Analyzed: 2009-04-16 Analyzed By: AR CCVsCCVs $\mathrm{CCVs}$ Percent

Found

Conc.

11.6

Percent

Recovery

93

Recovery

Limits

90 - 110

True

Conc.

12.5

Flag

 ${\bf Units}$ 

mg/Kg

Param

Chloride

Date

Analyzed

2009-04-16

LAB Order ID # 9040901

Page / of /

# TraceAnalysis, Inc.

6701 Aberdeen Avenue, Suite 9 **Lubbock, Texas 79424** Tel (806) 794-1296 Fax (806) 794-1298 1 (800) 378-1296 5002 Basin Street, Suite A1 Midland, Texas 79703 Tel (432) 689-6301 Fax (432) 689-6313 200 East Sunset Rd., Suite E El Paso, Texas 79922 Tel (915) 585-3443 Fax (915) 585-4944 1 (888) 888-3443

8808 Camp Bowie Blvd. West, Suite 180 Ft. Worth, Texas 76116 Tel (817) 201-5260 Fax (817) 560-4336

email: lab@tracean	alysis.con	n	1 (800) 378-1298	Fax (	(432) 689-6313	Fax (915) 585 1 (888) 588-	-4944 Fa 3443	ax (817) 560- <b>433</b> 6
Address: (Stroot, Sity, Zip)	to for	Phone SOUTING 1 Fax#	-2378			YSIS REQUEST pecify Method	d No.)	
2800 PLAINS HWY Confact Person: (AMILLE BRUAN		Angle No.	W SBZGT	)	(3)	Hg		dard
Invoice to: (If different from above) (RO(11A)	<u> </u>	87			TIB / 602 / 8260B / 624 B / 602 / 8260B / 624 TX1005 / TX1005 Ext(C35) DO / DRO / TVHC	Se Hg 6010B/200.7	980	m stan
Project # ROWN NO UF 57 Project Location (including state):		Samo	ot Name: 1 - 2 - 4 - 2		/ 8260B / 6 8260B / 6 / TX1005 O / TVHC	[윤]	C / 625	rent fro
WEST OF LOW GT		MATRIX	PRESERVATIVE		/ 602 / 8 602 / 82 1005 / T / DRO / 25		NB / 624 N 8270C N 608	e if diffe
LAB# FIELD CODE	CONTAINERS		METHOD	) SAIMPLING	8 2 - 9 8	etals Ag As Metals Ag Volatiles Semi Votal Pesticides	S Vol. 8260E S Semi. Vol. 8 8082 / 608 vides 8081A. TSS, pH ure Content	nd Tim
A BUSE ONLY	# CONTAINERS Volume / Amount	WATER SOIL AIR SLUDGE	HINO3 H <sub>2</sub> SO <sub>4</sub> NaOH ICE NONE	<del>*</del> '	MTBE 8021B / 1 BTEX 8021B / 60 TPH 418.1 / TX10 TPH 8015 GPO / PAH 8270C / 625	Total Metals Ag As Ba C TCLP Metals Ag As TCLP Volatiles TCLP Semi Votatiles TCLP Pesticides RCI	GC/MS Vol. 8260B / 624 GC/MS Semi. Vol. 8270C PCB's 8082 / 608 Pesticides 8081A / 608 BOD, TSS, pH Moisture Content	Turn Around Time if different from standard
193545 TRENCH 205 DEFACE	2 402	X	<del></del>	1/2 (83%			7	, Pr 1
546-10 ENCH 2@ 1 FOOT 547 TRENCH 2@ SURFACE	110			1050				
SAR TREACH 20 1.S FEET				1130				
19 TRENCH 30 14 INCHES				1150				
550 TRENCHYE SURFACE 551 TRENCHYE   FOOT	1 1			V 1250				
Relinquishee By: Company: Date:	Time:	Received by:	Company: Date:	Time: Tem	n <b>p</b> °c:	REMA	ARKS: A \	
amula Dayent Brain 4/8/09		H- Han		1545		JUSE REMA NLY	All tes	sts Midland.
Relinquished by: Company: Date:	Time:	1 1000 11 0	Bompany: Date:		np°c: Inac(5), 3.\°C Headspac		Dry Weight Basis Require	ed
Relinquished by Company: Date:	Time:	Received by:	Company: Date:	<u> </u>	13503 (4150 (100 (100 )		TRRP Report Required Check If Special Reportin Limits Are Needed	ng
Submittal of samples constitutes agreement to Terr	ms and Con	ditions listed on rever	rse side of C. O. C.		Carrier #	Carryin	\	



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

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

888 • 588 • 3443

806 • 794 • 1296 915 • 585 • 3443 432. 669 6301

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944

6015 Harris Parkway Suite 110

Ft. Worth, Texas 76132

817 • 201 • 5260

FAX 432 • 689 • 6313

E-Mail, lab@traceanalysis.com

Certifications

**WBENC:** 237019

HUB:

1752439743100-86536

**DBE**: VN 20657

NCTRCA WFWB38444Y0909

**NELAP Certifications** 

Lubbock:

T104704219-08-TX

LELAP-02003 Kansas E-10317 El Paso: T104704221-08-TX

LELAP-02002

Midland: T104704392-08-TX

# **Analytical and Quality Control Report**

Camille Bryant Basin Environmental Consulting 2800 Plains Hwy. P. O. Box 381 Lovington, NM, 88260

Report Date: July 7, 2009

Work Order: 9070205 

Project Location: West of Lovington, NM

Project Name:

NM-27 #2

Project Number:

Crownquest

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

			$\operatorname{Date}$	$\operatorname{Time}$	Date
Sample	Description	Matrix	Taken	Taken	Received
200863	North Area	soil	2009-06-30	11:00	2009-07-02
200864	Center Area	soil	2009-06-30	12:00	2009-07-02
200865	South Area	soil	2009-06-30	13:00	2009-07-02

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

This report consists of a total of 14 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

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

# Standard Flags

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

# Case Narrative

Samples for project NM-27 #2 were received by TraceAnalysis, Inc. on 2009-07-02 and assigned to work order 9070205. Samples for work order 9070205 were received intact at a temperature of 3.4 deg. C.

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

		$\operatorname{Prep}$	$\operatorname{Prep}$	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	52140	2009-07-02 at 11:23	61139	2009-07-02 at 11:23
Chloride (IC)	E 300.0	52169	2009-07-02 at 12:00	61193	2009-07-07 at 09:42
TPH DRO	Mod. 8015B	52097	2009-07-02 at 10:30	61090	2009-07-02 at 12:12
TPH GRO	S 8015B	52140	2009-07-02 at 11:23	61140	2009-07-02 at 11:23

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 9070205 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.

Crownquest

Work Order: 9070205 NM-27 #2

Page Number: 4 of 14 West of Lovington, NM

# **Analytical Report**

Sample: 200863 - North Area

Midland Laboratory:

Analysis: **BTEX** QC Batch: 61139 Prep Batch: 52140

Analytical Method: S 8021B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

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

RLFlag Parameter

Units Dilution RLResult Benzene < 0.0100 mg/Kg 0.0100 Toluene mg/Kg 1 0.0100 0.115 Ethylbenzene 1 0.0100 < 0.0100 mg/Kg 1 Xylene 0.371mg/Kg 0.0100

					$\mathbf{Spike}$	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	$\mathbf{Units}$	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.92	mg/Kg	1	2.00	96	49 - 129.7
4-Bromofluorobenzene (4-BFB)		1.46	m mg/Kg	1	2.00	73	45.2 - 144.3

Sample: 200863 - North Area

Laboratory: Midland

Chloride (IC) Analysis: QC Batch: 61193 Prep Batch: 52169

Analytical Method: E 300.0 Date Analyzed: 2009-07-07 Sample Preparation: 2009-07-06

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

RLResult Units Parameter Flag Dilution RL3570 Chloride mg/Kg 100 1.00

Sample: 200863 - North Area

Laboratory: Midland

Analysis: TPH DRO QC Batch: 61090 Prep Batch: 52097

Analytical Method: Mod. 8015B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

Prep Method: N/A Analyzed By:  $\mathbf{AG}$ Prepared By: AG

Parameter	Flag	Result	Units	Dilution	$\mathrm{RL}$
DRO		474	mg/Kg	1	50.0

RL

Crownquest

Work Order: 9070205

NM-27 #2

Page Number: 5 of 14 West of Lovington, NM

					Spike	Percent	Recovery
Surrogate	Flag	Result	${ m Units}$	Dilution	Amount	Recovery	Limits
n-Triacontane	1	420	mg/Kg	1	100	420	13.2 - 219.3

#### Sample: 200863 - North Area

Laboratory:

Midland

TPH GRO Analysis: QC Batch: 61140 Prep Batch: 52140

Analytical Method: S 8015B Date Analyzed:

2009-07-02 Sample Preparation: 2009-07-02 Prep Method: S 5035 Analyzed By: ME

ME

Prepared By:

RL

RLParameter Result Units Dilution Flag 6.24GRO mg/Kg 1.00

Surrogate	Flag	Result	Units	Dilution	$egin{array}{c} \mathbf{Spike} \ \mathbf{Amount} \end{array}$	Percent Recovery	$egin{array}{c}  ext{Recovery} \  ext{Limits} \end{array}$
Trifluorotoluene (TFT)	<del></del>	1.92	mg/Kg	1	2.00	96	68.5 - 119.4
4-Bromofluorobenzene (4-BFB)		1.64	mg/Kg	1	2.00	82	52 - 117

#### Sample: 200864 - Center Area

Laboratory:

Midland

Analysis: BTEX QC Batch: 61139 Prep Batch: 52140

Analytical Method: S 8021B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

RL

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

Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
Benzene		< 0.0100	mg/Kg	1	0.0100
Toluene		< 0.0100	m mg/Kg	1	0.0100
Ethylbenzene		< 0.0100	mg/Kg	1	0.0100
Xylene		< 0.0100	mg/Kg	1	0.0100

					$_{ m Spike}$	Percent	Recovery
Surrogate	$\mathbf{Flag}$	Result	${ m Units}$	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.94	mg/Kg	1	2.00	97	49 - 129.7
4-Bromofluorobenzene (4-BFB)		1.39	${ m mg/Kg}$	1	2.00	70	45.2 - 144.3

#### Sample: 200864 - Center Area

Laboratory:

Midland

Analysis: Chloride (IC) QC Batch: 61193 Prep Batch: 52169

Analytical Method: E 300.0 Date Analyzed: Sample Preparation:

2009-07-07 2009-07-06 Prep Method: N/A Analyzed By: ARPrepared By: AR

<sup>&</sup>lt;sup>1</sup> High surrogate recovery due to peak interference.

Crownquest

Work Order: 9070205 NM-27 #2 Page Number: 6 of 14 West of Lovington, NM

Sample: 200864 - Center Area

Laboratory: Midland

Analysis: TPH DRO QC Batch: 61090 Prep Batch: 52097 Analytical Method: Mod. 8015B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

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

Spike Percent Recovery Surrogate Flag Result Units Dilution Amount Recovery Limits n-Triacontane 99.8 mg/Kg 1 100 100 13.2 - 219.3

Sample: 200864 - Center Area

Laboratory: Midland

Analysis: TPH GRO QC Batch: 61140 Prep Batch: 52140 Analytical Method: S 8015B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

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

Percent Recovery Spike Flag Surrogate Result Units Dilution Amount Recovery Limits Trifluorotoluene (TFT) 1.89 1 2.00 94 68.5 - 119.4 mg/Kg 4-Bromofluorobenzene (4-BFB) 1.52 mg/Kg 1 2.00 76 52 - 117

Sample: 200865 - South Area

Laboratory: Midland

Analysis: **BTEX** Analytical Method: S 8021B Prep Method: S 5035 QC Batch: 61139 Analyzed By: Date Analyzed: 2009-07-02 ME Prep Batch: 52140 Sample Preparation: 2009-07-02 Prepared By: ME

Crownquest

Work Order: 9070205

NM-27 #2

Page Number: 7 of 14 West of Lovington, NM

		m RL			
Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
Benzene		< 0.0100	mg/Kg	1	0.0100
Toluene		< 0.0100	mg/Kg	1	0.0100
Ethylbenzene		< 0.0100	mg/Kg	1	0.0100
Xylene		< 0.0100	m mg/Kg	1	0.0100

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.91	mg/Kg	1	2.00	96	49 - 129.7
4-Bromofluorobenzene (4-BFB)		1.37	$_{ m mg/Kg}$	1	2.00	68	45.2 - 144.3

Sample: 200865 - South Area

Laboratory:

Midland

Chloride (IC) Analysis: QC Batch: 61193 Prep Batch: 52169

Analytical Method: Date Analyzed:

Sample Preparation:

E 300.0 2009-07-07 2009-07-06 Prep Method: N/A Analyzed By: AR

Prepared By: AR

RL

Parameter	$\operatorname{Flag}$	Result	Units	Dilution	RL
Chloride		14.2	mg/Kg	5	1.00

Sample: 200865 - South Area

Laboratory:

Midland

Analysis: TPH DRO QC Batch: 61090 Prep Batch: 52097

Analytical Method: Date Analyzed:

Sample Preparation:

Mod. 8015B 2009-07-02 2009-07-02

Prep Method: N/A Analyzed By: AGPrepared By: AG

RLParameter Flag Result Units Dilution RLDRO < 50.0 50.0 mg/Kg 1

α .	Di	D 1	TT 11	D.1	Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontane		81.6	mg/Kg	1	100	82	13.2 - 219.3

Sample: 200865 - South Area

Midland Laboratory:

TPH GRO Analysis: QC Batch: 61140 Prep Batch: 52140

Analytical Method: S 8015B Date Analyzed: 2009-07-02 Sample Preparation: 2009-07-02

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

 ${\bf Crownquest}$ 

Work Order: 9070205

NM-27 #2

Page Number: 8 of 14 West of Lovington, NM

Parameter	Flag		$rac{ ext{RL}}{ ext{Result}}$		Units		Dilution	RL
GRO		8.95 mg/Kg			1			
Surrogate		Flag	Result	Units	Dilution	$\begin{array}{c} \mathbf{Spike} \\ \mathbf{Amount} \end{array}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.89	mg/Kg	1	2.00	94	68.5 - 119.4
4-Bromofluorobenzene (4	-BFB)		1.46	mg/Kg	1	2.00	73	52 - 117

Method Blank (1)

QC Batch: 61090

QC Batch: 61090 Prep Batch: 52097

Parameter

 $\overline{\mathrm{DRO}}$ 

Date Analyzed: 2009-07-02 QC Preparation: 2009-07-02 Analyzed By: AG Prepared By: AG

MDL Flag Result

 Result
 Units
 RL

 <5.86</td>
 mg/Kg
 50

					Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontane		140	mg/Kg	1	100	140	13 - 178.5

Method Blank (1) Q

QC Batch: 61139

QC Batch: 61139 Prep Batch: 52140 Date Analyzed: 2009-07-02 QC Preparation: 2009-07-02 Analyzed By: ME Prepared By: ME

		$\operatorname{MDL}$		
Parameter	Flag	Result	Units	RL
Benzene		< 0.00100	mg/Kg	0.01
Toluene		< 0.00100	m mg/Kg	0.01
Ethylbenzene		< 0.00110	${ m mg/Kg}$	0.01
Xylene		< 0.00360	mg/Kg	0.01

					Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	${f Units}$	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.96	mg/Kg	1	2.00	98	65.6 - 130.6
4-Bromofluorobenzene (4-BFB)		1.74	m mg/Kg	1	2.00	87	51.9 - 128.1

Method Blank (1)

QC Batch: 61140

QC Batch: 61140 Prep Batch: 52140 Date Analyzed: 2009-07-02 QC Preparation: 2009-07-02

Analyzed By: ME Prepared By: ME

Crownquest

Work Order: 9070205 NM-27 #2

Page Number: 9 of 14 West of Lovington, NM

		$\operatorname{MDL}$		
Parameter	Flag	$\mathbf{Result}$	${ m Units}$	RL
GRO		< 0.482	mg/Kg	1

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.95	mg/Kg	1	2.00	98	71.9 - 115
4-Bromofluorobenzene (4-BFB)		1.78	mg/Kg	1	2.00	89	45.7 - 118.9

Matrix Blank (1)

QC Batch: 61193

QC Batch: 61193 Prep Batch: 52169 Date Analyzed: 2009-07-07 QC Preparation: 2009-07-02

0.605

Analyzed By: AR Prepared By: AR

MDL Flag Result Parameter

RLUnits mg/kg 1

# Laboratory Control Spike (LCS-1)

QC Batch:

Chloride

61090

Date Analyzed:

2009-07-02

Analyzed By: AG

Prep Batch: 52097

QC Preparation: 2009-07-02

Prepared By: AG

	LCS			Spike	Matrix		Rec.
Param	Result	${ m Units}$	Dil.	Amount	Result	Rec.	Limit
DRO	223	mg/Kg	1	250	< 5.86	89	57.4 - 133.4

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

	LCSD			$\mathbf{S}_{\mathbf{P}ike}$	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	$\operatorname{Limit}$
DRO	239	mg/Kg	1	250	< 5.86	96	57.4 - 133.4	7	20

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

	LCS	$_{ m LCSD}$			$\mathbf{Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Triacontane	80.0	82.2	mg/Kg	1	100	80	82	48.5 - 146.7

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

QC Batch:

61139

Date Analyzed:

2009-07-02

Analyzed By: ME Prepared By: ME

Prep Batch: 52140

QC Preparation: 2009-07-02

Work Order: 9070205

Crownquest NM-27 #2 West of Lovington, NM

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$
Benzene	1.86	mg/Kg	1	2.00	< 0.00100	93	72.7 - 129.8
Toluene	1.84	mg/Kg	1	2.00	< 0.00100	92	71.6 - 129.6
Ethylbenzene	1.83	mg/Kg	1	2.00	< 0.00110	92	70.8 - 129.7
Xylene	5.44	mg/Kg	1	6.00	< 0.00360	91	70.9 - 129.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$	RPD	$\operatorname{Limit}$
Benzene	1.88	mg/Kg	1	2.00	< 0.00100	94	72.7 - 129.8	1	20
Toluene	1.87	mg/Kg	1	2.00	< 0.00100	94	71.6 - 129.6	2	20
Ethylbenzene	1.92	mg/Kg	1	2.00	< 0.00110	96	70.8 - 129.7	5	20
Xylene	5.73	mg/Kg	1	6.00	< 0.00360	96	70.9 - 129.4	5	20

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

	LCS	LCSD			$\mathbf{Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	${f Limit}$
Trifluorotoluene (TFT)	2.01	1.99	mg/Kg	1	2.00	100	100	65.9 - 132
4-Bromofluorobenzene (4-BFB)	1.78	1.78	$_{ m mg/Kg}$	1	2.00	89	89	55.2 - 128.9

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

QC Batch:

61140 Prep Batch: 52140 Date Analyzed: QC Preparation:

2009-07-02 2009-07-02

Analyzed By: ME Prepared By: ME

Page Number: 10 of 14

LCS Matrix Rec. Spike Limit Param Result Units Dil. Amount Result Rec. 14.0 GRO 20.070 60.5 - 100.1 mg/Kg < 0.482

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	$\mathbf{Limit}$
GRO	15.9	mg/Kg	1	20.0	< 0.482	80	60.5 - 100.1	13	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.	${f Limit}$
Trifluorotoluene (TFT)	1.96	1.96	mg/Kg	1	2.00	98	98	78.8 - 104.7
4-Bromofluorobenzene (4-BFB)	1.86	1.95	mg/Kg	1	2.00	93	98	66.1 - 108.3

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

QC Batch: 61193 Prep Batch: 52169

Date Analyzed: 2009-07-07 QC Preparation: 2009-07-02

Analyzed By: AR Prepared By: AR

Crownquest

Param

Chloride

Work Order: 9070205

NM-27 #2

Page Number: 11 of 14 West of Lovington, NM

Param	$\begin{array}{c} \text{LCS} \\ \text{Result} \end{array}$	$_{ m Units}$	Dil.	$\begin{array}{c} {\rm Spike} \\ {\rm Amount} \end{array}$	Matrix Result	Rec.	$rac{ m Rec.}{ m Limit}$
Chloride	26.9	mg/Kg	1	25.0	< 0.0430	108	90 - 110
Percent recovery is based	on the spike result. RPI	) is based on	the spike	and spike dup	licate result.		
	LCSD		Spike	Matrix	Re	ec.	RPD

Dil.

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

Units

Matrix Spike (MS-1)

Spiked Sample: 200864

Result

27.1

QC Batch:

61090

Date Analyzed:

2009-07-02

Amount

25.0

Result

< 0.0430

Rec.

108

Analyzed By: AG

RPD

1

Limit

Limit

90 - 110

Prep Batch: 52097

QC Preparation: 2009-07-02

Prepared By: AG

	MS			Spike	Matrix		Rec.
Param	Result	$\mathbf{Units}$	Dil.	Amount	Result	Rec.	$_{ m Limit}$
DRO	306	mg/Kg	1	250	110	78	35.2 - 167.1

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	Limit
DRO	298	mg/Kg	1	250	110	75	35.2 - 167.1	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	$\mathbf{Units}$	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Triacontane	72.9	70.8	mg/Kg	1	100	73	71	34.5 - 178.4

Matrix Spike (MS-1) Spiked Sample: 200840

QC Batch: 61139 Prep Batch: 52140 Date Analyzed: QC Preparation: 2009-07-02

2009-07-02

Analyzed By: ME Prepared By: ME

	MS			$\mathbf{Spike}$	Matrix		Rec.
Param	Result	${ m Units}$	Dil.	${f Amount}$	Result	${ m Rec.}$	Limit
Benzene	1.76	mg/Kg	1	2.00	< 0.00100	88	58.6 - 165.2
Toluene	1.71	m mg/Kg	1	2.00	< 0.00100	86	64.2 - 153.8
Ethylbenzene	1.71	mg/Kg	1	2.00	< 0.00110	86	61.6 - 159.4
Xylene	4.92	mg/Kg	1	6.00	0.283	77	64.4 - 155.3

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

continued ...

Work Order: 9070205

Crownquest

NM-27 #2

Page Number: 12 of 14 West of Lovington, NM

matrix spikes continued									
•	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	$\mathbf{Limit}$
Benzene	1.73	mg/Kg	1	2.00	< 0.00100	86	58.6 - 165.2	2	20
Toluene	1.71	mg/Kg	1	2.00	< 0.00100	86	64.2 - 153.8	0	20
Ethylbenzene	1.78	mg/Kg	1	2.00	< 0.00110	89	61.6 - 159.4	4	20
Xylene	5.10	mg/Kg	1	6.00	0.283	80	64.4 - 155.3	4	20

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

		MS	MSD			Spike	MS	MSD	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	${f Limit}$
Trifluorotoluene (TFT)		1.96	1.91	mg/Kg	1	2	98	96	76 - 127.9
4-Bromofluorobenzene (4-BFB)	2 3	1.38	1.40	$\mathrm{mg}/\mathrm{Kg}$	1	2	69	70	72 - 127.8

Matrix Spike (MS-1) Spiked Sample: 200839

QC Batch: 61140 Prep Batch: 52140

Date Analyzed:

QC Preparation: 2009-07-02

2009-07-02

Analyzed By: ME Prepared By: ME

	MS			Spike	Matrix		Rec.
Param	Result	${f Units}$	Dil.	Amount	Result	Rec.	Limit
GRO	41.3	mg/Kg	1	20.0	22.3002	95	12.8 - 175.2

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

	MSD			$\mathbf{S}_{\mathbf{P}i\mathbf{k}\mathbf{e}}$	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	35.9	mg/Kg	1	20.0	22.3002	68	12.8 - 175.2	14	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	$\operatorname{Result}$	$\operatorname{Result}$	${f Units}$	Dil.	Amount	${ m Rec.}$	${ m Rec.}$	${f Limit}$
Trifluorotoluene (TFT)	2.10	2.08	mg/Kg	1	2	105	104	60.8 - 132.1
4-Bromofluorobenzene (4-BFB)	1.54	1.44	mg/Kg	1	2	77	72	31.3 - 161.7

Matrix Spike (MS-1) Spiked Sample: 200865

QC Batch: 61193 Prep Batch: 52169 Date Analyzed: 2009-07-07 QC Preparation: 2009-07-02 Analyzed By: AR Prepared By: AR

<sup>&</sup>lt;sup>2</sup>Surrogate out due to peak interference.

<sup>&</sup>lt;sup>3</sup>Surrogate out due to peak interference.

Crownquest

Work Order: 9070205

NM-27 #2

Page Number: 13 of 14 West of Lovington, NM

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride	165	ma/Ka	5	138	14 2	110	90 - 110

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

	MSD			Spike	Matrix		Rec.		RPD
Param	$\operatorname{Result}$	Units	Dil.	Amount	Result	Rec.	$\operatorname{Limit}$	RPD	Limit
Chloride	162	mg/Kg	5	138	14.2	107	90 - 110	2	

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

#### Standard (CCV-1)

QC Batch: 61090

Date Analyzed: 2009-07-02

Analyzed By: AG

			$\mathbf{CCVs}$	CCVs	$\mathrm{CCVs}$	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	228	91	80 - 120	2009-07-02

#### Standard (CCV-2)

QC Batch: 61090

Date Analyzed: 2009-07-02

Analyzed By: AG

			CCVs	$\mathrm{CCVs}$	CCVs	Percent	
			$\operatorname{True}$	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	237	95	80 - 120	2009-07-02

#### Standard (CCV-1)

QC Batch: 61139

Date Analyzed: 2009-07-02

Analyzed By: ME

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.100	100	80 - 120	2009-07-02
Toluene		$_{ m mg/Kg}$	0.100	0.100	100	80 - 120	2009-07-02
Ethylbenzene		$_{ m mg/Kg}$	0.100	0.104	104	80 - 120	2009-07-02
Xylene		mg/Kg	0.300	0.312	104	80 - 120	2009-07-02

# Standard (CCV-2)

QC Batch: 61139

Date Analyzed: 2009-07-02

Crownquest

Work Order: 9070205 NM-27 #2 Page Number: 14 of 14 West of Lovington, NM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.0934	93	80 - 120	2009-07-02
Toluene		mg/Kg	0.100	0.0914	91	80 - 120	2009-07-02
Ethylbenzene		mg/Kg	0.100	0.0897	90	80 - 120	2009-07-02
Xylene		mg/Kg	0.300	0.266	89	80 - 120	2009-07-02

# Standard (CCV-1)

QC Batch: 61140

Date Analyzed: 2009-07-02

Analyzed By: ME

			CCVs	$\mathbf{CCVs}$	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
$\overline{\text{GRO}}$		mg/Kg	1.00	0.997	100	80 - 120	2009-07-02

#### Standard (CCV-2)

QC Batch: 61140

Date Analyzed: 2009-07-02

Analyzed By: ME

			$_{ m CCVs}$	CCVs	CCVs	Percent	Data
Param	Flag	Units	True Conc.	Found Conc.	Percent Recovery	$egin{array}{c}  ext{Recovery} \  ext{Limits} \end{array}$	$egin{array}{c} { m Date} \ { m Analyzed} \end{array}$
GRO		mg/Kg	1.00	1.09	109	80 - 120	2009-07-02

#### Standard (ICV-1)

QC Batch: 61193

Date Analyzed: 2009-07-07

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	25.0	23.4	94	90 - 110	2009-07-07

# Standard (CCV-1)

QC Batch: 61193

Date Analyzed: 2009-07-07

Analyzed By: AR

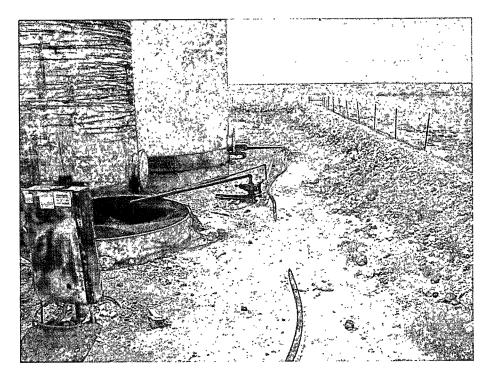
			CCVs	CCVs	$\operatorname{CCVs}$	Percent	
			$\operatorname{True}$	Found	Percent	Recovery	Date
Param	$\operatorname{Flag}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	25.0	23.2	93	90 - 110	2009-07-07

	(1070705
LAB Order ID #	9070205

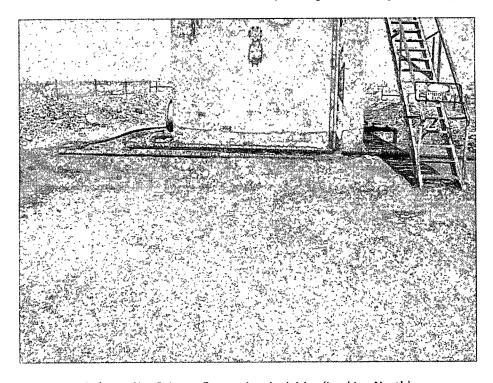
Page (	of	

	TraceAi	nalysis,	Inc.	6701 Aberdeen Avenue, Lubbock, Texas 79 Tel (806) 794-129 Fax (806) 794-129	424 Midland 1	Street, Suite A1 Texas 79703 ) 689-6301	200 East Sunset Rd., S El Paso, Texas 799 Tel (915) 585-344	<b>722</b> Ft. Worth, Texas 76116 3 Tel (817) 201-5260	
		traceanalysis.com	n O	Fax (806) 794-129 1 (800) 378-129	98 Fax (432 6	2) 689-6313	Fax (915) 585-494 1 (888) 588-3443		
Company Na	SIN SNUIROM (Street, Gity, Zip)	MENTAL	LWSUCI	one #: 575-	396-Z378	\$		s REQUEST cify Method No.)	
20	COLLAINS	Huy Lor		NM 8826	00				
Contact Per	Amius to	BRYANTI		nall: CAANTOLOUSIN.	- Consulting Co	A SEN	0/200.	ndam	
Involce to: (If different t	from above)	whole		3	7	Ext(C35) 7 C	9 6010/20	ats an ats	
M 27 7 5 CV							Cd Cr Pb Se Hg 6010/200.7 Ba Cd Cr Pb Se Hg s s	270 / 625 88 Z20E different from standard	
	ation (including state):	FOW NM	() /5°	mpler Signature:	98 1 \ Q \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	260 / 624 / TX1005 O / TVHC	S S S S S S S S S S S S S S S S S S S	70 / 6	
	or Course		MATRIX	PRESERVATIVE METHOD	SAMPLING 8	BTEX 2021/202/8260/624 TPH 418.1/TX1005/TX1005 IPH 2015/GROY DRO/TVHC PAH 8270/625	Total Metals Ag As Ba Cd (TCLP Metals Ag As Ba TCLP Volatiles TCLP Semi Volatiles TCLP Pesticides RCI GC/MS Vol. 8260 / 624		
		# CONTAINERS Volume / Amount		MEINOD		BTEX 2021/8 TPH 418.1/TX IPH 8015 GRO PAH 8270 / 625	Total Metals Ag As Ba C TCLP Metals Ag As I TCLP Volatiles TCLP Semi Volatiles TCLP Pesticides RCI GC/MS Vol. 8260 / 6	GC/MS Semi. Vol. PCB's 8082 / 608 Pesticides 8081 / 6 BOD, TSS, pH Maisture Content A DCL 0 CT Tum Around Time	
LAB# /LAB USE\	FIELD CODE	DNTA	WATER SOIL AIR. SLUDGE	2 7 E H	ויעניו	BTEX 2021 TPH 418.1 / TPH 2015 G PAH 8270 /	Total Metals Ag A TCLP Metals A TCLP Volatiles TCLP Semi Vo TCLP Pesticide RCI GC/MS Vol. 82	GC/MS Semi. PCB's 8082 / 6 Pesticides 808 BOD, TSS, pH Maisture Conte	
ONLY		# Color	WATER SOIL AIR. SLUDGE	HCI HNO <sub>3</sub> NaOH ICE NONE	DATE TIME	TPH 4	TCLP TCLP TCLP TCLP TCLP TCLP GC/M8	GC/MS S PCB's 80 PCB's 80 Pesticide BOD, TS Maisture Maisture Tum Arou	
200863	NORTH ARE	4 1 404		l X	6301100	XX		N N N N N N N N N N N N N N N N N N N	
864	CENTERARE	A   1   1			1200				
865	SOUTH AREA	+ VV			V 1300	MM			
						<u> </u>			
			++++						
	· · · · · · · · · · · · · · · · · · ·								
Relinquishe	ed by: Company:	Date: Time:	Received by:	Company: Date:	Time: INST	LAI	B USE REMARK	(S:	
Relinguish	ed by: L Company:	12/09 0904 Date: Time:	Received by:	Company: Date:	Time: INST_			tests Midland	
Relinquished by: Company: Date: Time: Received by: Company: Date: Time: INST Intal Y N OBS COR_ CHERTOSPACE Y NAVA_									
Relinquished by: Company: Date: Time: Received by:				Company: Date:	Time: INST_	T TRP Report Required			
					OBS COR	C Log in F		special Reporting	
Submittal of	f samples constitutes agreem		ditions listed on re	everse side of C. O. C.	_ <u>c</u>	Carrier #	arryin		

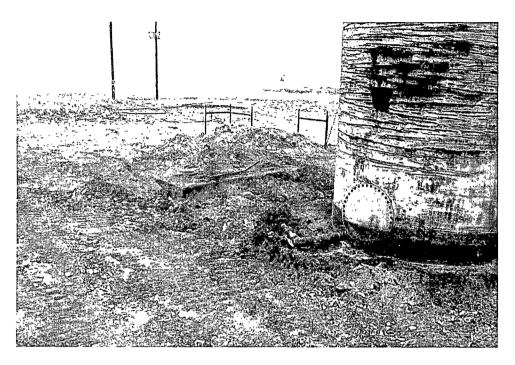
Appendix C Photographs



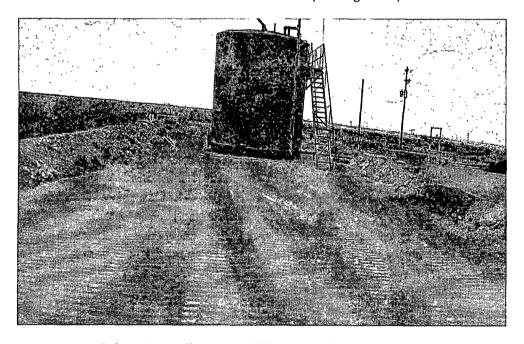
Release Site Prior to Excavation Activities (Looking South along West Side)



Release Site Prior to Excavation Activities (Looking North)



Release Site Excavation Activities (Looking North)



Release Site Following Backfill Activities (Looking North)

# Appendix D Release Notification and Corrective Action (Form C-141)

<u>District 1</u> 625 N. French Dr., Hobbs, NM 88240

State of New Mexico

Form C-141

Revised October 10, 2003

istrict II
301 W. Grand Avenue, Artesia, NA CET WETTER Minerals and Natural Resources bistrict III
000 Rio Brazos Road, Aztec, NM 87410
MAY 19 ZIJUS
220 S. St. Francis Dr., Santa Fe, NM 87505

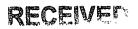
Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

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

# **Release Notification and Corrective Action**

						OPE	RATOR		☐ Initial Report Final Report			
Name of Company CrownQuest Operating, LLC						Contact Kent Crabtree						
Address PO Box 53310 Midland, Texas 79710						Telephone No. 432-556-0770						
Facility Name SWD-215, State 27 No.2 SWD						Facility Type SWD						
Surface Owner State of New Mexico Mineral Owner						-	**************************************	Lease No.				
LOCATIO						NOFRE	LEASE	API# 30.025.22932.00.00				
Unit Letter P	etter Section Township Range Feet from th		Feet from the		/South Line			Vest Line	County Lea			
	1		Latitue	de 33 04' 12.12'	' North	Longitude 103 41' 57.76"West						
`				NAT	'URE	OF REL	EASE					
Type of Release Produced Water/Crude Oil						Volume of Release Unknown			Volume Recovered Unknown			
Source of Release Daily Operations at Facility						Date and Hour of Occurrence Unknown			Date and Hour of Discovery Unknown			
Was Immediate Notice Given?  Yes ☐ No ☒ Not Required						If YES, To Whom?						
By Whom?						Date and Hour						
Was a Watercourse Reached? ☐ Yes ☒ No						If YES, Volume Impacting the Watercourse.						
If a Watercou	rrse was Im	pacted, Descr	be Fully.	•					T-T-	MATERO	175 <sup>1</sup>	
Describe Cau	se of Proble	em and Remed	dial Action	n Taken: Circulati	ng pun	p has been re	paired and location	n is bei	ng delineate			
Describe Are	a Affected a	and Cleanup A	Action Tak	cen. Release impa	icted an	arca measuri	ng approximately	135 fee	t by 45 feet	t.		
regulations a public health should their or or the enviro	If operators or the envi operations h nment. In	are required ironment. The nave failed to	to report e acceptar adequatel IOCD acc	ve is true and cor and/or file certain nee of a C-141 re y investigate and eptance of a C-14	releas port by remedia	e notification the NMOCE ate contamina	s and perform co marked as "Fina tion that pose a tl elieve the operate	rrective al Repor breat to or of res	actions for t" does not ground wat sponsibility	r releases, which relieve the oper ter, surface water for compliance	n may endanger rator of liability rr, human health	
						OIL CONSERVATION DIVISION						
Signature: Kut Grilled						Approved by District Supervisor: Step Column						
Printed Name: Kent Crabtree						Approved by	District Supervisi	Jeogh John				
Title: Foreman						Approval Date: 05/4/09   Expiration Date: 07/20/09			,9			
E-mail Address. kcrabtree@crownquest.com						Conditions of Approval: FINAL C-141 BY						
Date:			Phone:	432-556-0770						IPP. NO. 5	- 2187	

2188



BIDS BY YAM

HUBBSUCU