

Patrick E. Flynn Vice President, Governmental Affairs 303.534.4600 x 1145 pflynn@resoluteenergy.com

February 5, 2016

**RECEIVED** By JKeyes at 2:21 pm, Feb 08, 2016

**APPROVED** By JKeyes at 2:21 pm, Feb 08, 2016

Ms. Kellie Jones Environmental Specialist New Mexico Oil Conservation Division 1625 N. French Drive Hobbs, New Mexico 88240

Re: Report of Site Assessment, Remedial Activities, and Closure Request Shell Maxwell No.1 SWD Produced Water Release Lea County, New Mexico

Dear Ms. Jones,

On September 8, 2015, Resolute Natural Resources Company, LLC (Resolute) experienced a release of 10-Bbl of produced water from the injection manifold at the Shell Maxwell No. 1 SWD tank battery in the Denton Field of Lea County, New Mexico. The cause of the release was corrosion of the steel manifold. This letter describes the spill response activities undertaken by Resolute, including excavation of affected soil and laboratory analysis of confirmation soil samples, as well as information concerning the depth to ground water and a request for closure.

#### **Initial Spill Response**

Upon discovering the release, the field operator shut in the field and isolated the corroded section of injection manifold, which was subsequently replaced. The released fluid was contained to the tank battery location by an earthen berm surrounding the facility. Materially all of the fluid was recovered using a vacuum truck and transported to the Gandy Marley, Inc. facility for disposal.

#### **Soil Excavation**

A total of 34 cubic yards of chloride-affected soil were removed from the tank battery pad during three excavation events and taken to Gandy Marley, Inc. for disposal. On September 30, 2015, the upper three inches (in) of soil were excavated from the area impacted by the spill as depicted on the site plan contained as Figure 1. Analytical results discussed below and field screening for chlorides in soil directed two further rounds of soil removal. On November 17, 2015,



an additional three-in of soil were removed from the spill path south of the injection manifold. On January 27, 2016, soil was removed to a depth of three feet (ft) from a 12-ft by 12-ft area surrounding the manifold itself and along the lease road access to the tank battery. A hard packed caliche layer present at three-ft below the ground surface (bgs) inhibited deeper excavation and also likely served as a barrier to downward migration of the produced water released (Figures 2 through 5).

#### **Soil Analytical Results**

Soil samples were collected for laboratory analysis at three points: 1) immediately adjacent to the source of the release at the injection manifold (SS-1); 2) approximately 25-ft south of the manifold, within the lease road entering the tank battery location (SS-2), and; 3) approximately 65-ft south of the manifold where the spill terminated along the southeast corner of the location berm (SS-3). The soil samples were submitted to TraceAnalysis, Inc. in Lubbock, Texas for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), total petroleum hydrocarbons (TPH), and chlorides. Analytical results following the first round of soil removal indicated BTEX and TPH were not present in any of the three samples collected. Chloride concentrations ranged from 3,220 milligrams per kilogram (mg/Kg) in SS-1 to 23,700 mg/Kg in SS-2. Chlorides were present at a concentration of 4,200 mg/Kg where the spill terminated inside the southeast corner of the location berm.

Soil samples collected following the November 17, 2015 excavation were analyzed for chlorides only. Chlorides in SS-2 were reduced from 23,700 mg/Kg to 957 mg/Kg; Chlorides in SS-3 were reduced from 4,200 mg/Kg to 287 mg/Kg. Following the third round of excavation around the injection manifold on January 27, 2016, laboratory analysis of SS-1 detected chloride at a concentration of 379 mg/Kg, down from over 3,200 mg/Kg detected in the first two rounds of sampling. Soil analytical and field test result are summarized in Table 1. Laboratory analytical reports and chain of custody forms are included as Attachment 1.

#### **Depth to Ground Water**

Resolute reviewed New Mexico Office of the State Engineer records for all water wells located within Section 27, Township 14S-Range 37E to determine the depth to ground water in the vicinity of the release. The records reviewed were associated with water wells drilled as early as 1951 and as recently as 2007. Wells drilled between 1951 and 1971 reported the depth to ground water as averaging approximately 55-ft bgs. However, the depth to water in wells drilled since the 1990's has exceeded 100-ft bgs in all but one case and averages approximately 103-ft bgs. Depth to ground water in the most recent well drilled in 2007 was measured to be 111-ft bgs. A plot of depth to ground water versus the year each water well was drilled depicts a steady decline in the ground water elevation, suggesting ground water withdrawal since the 1950's has lowered the water table significantly (Figure 6). State Engineer Point of Diversion Summaries for each water well present in Section 27 are contained in Attachment 2.



#### **Request for Closure**

Previously you suggested Resolute determine the depth of a soil chloride limit of 250 mg/Kg. Field chloride tests and laboratory analytical results have determined chlorides are present at concentrations ranging from 287 mg/Kg to 379 mg/Kg at a depth one-half to three-ft, below which exists a hard soil and rock layer resistant to infiltration and excavation. Based on: a) the low residual chloride concentration at all three soil sample locations analyzed; b) the presence of the hard caliche layer at 3-ft bgs which limits downward migration of water; c) the depth to ground water in excess of 100-ft bgs; d) the relatively small volume of produced water released, and; e) the absence of hydrocarbons in soil analyzed, Resolute respectfully requests NMOCD grant closure for this site with no further action required. An updated NMOCD Form C-141 is included as Attachment 3.

Thank you for your time and consideration. Please call me with any questions or comments considering our assessment and remedial activities and this closure request.

Sincerely,

**RESOLUTE NATURAL RESOURCES COMPANY, LLC** 

Patrick E/Flynn Vice President, Governmental Affairs

Attachments



# Resolute



Figure 2. View of new injection header that replaced corroded pipe which was the source of the produced water spill. Soil sample SS-1 was collected near the base of the header.



Figure 3. View looking south from the injection header along the spill's path showing the extent of produced water on the ground surface and soil sample locations SS-2 and SS-3.

Resolute Natural Resources Company, LLC 1700 Lincoln Street, Suite 2800, Denver, CO 80203 Voice: 303.534.4600 Fax: 303.623.3628





Figure 4. View of excavation at the base of the injection header.



Figure 5. View looking down on hard-packed caliche layer that underlies the tank battery location at a depth of approximately three-feet below the ground surface.

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Depth to Water	(Ft-bgs)	-50	-50	-45	-50	-60	-40	-70	-62	-72	-102	-107	-105	-70	-104	-112	-115
	Year Drilled	1951	1952	1953	1953	1953	1954	1954	1965	1971	1994	1995	1998	1999	2001	2004	2006

-111

2007



Table 1

# Shell Maxwell No. 1 Tank Battery (Denton Field) - September 8, 2015 Spill

Results
Test <sup>1</sup>
Field
l and
nalytica
Soil Ar

		Notes	Chlorides	Adjacent to injection manifold -	) 3220 source of release	25-ft south of manifold in lease	23700 road access to location	65-ft south of manifold inside	0 4200 SE corner of location berm	Adjacent to injection manifold -	3250 source of release	25-ft south of manifold in lease	957	65-ft south of manifold inside	287 SE corner of location berm	Adjacent to injection manifold -	379 source of release	25-ft south of manifold in lease	NA road access to location
		1	TPHD		DN		DN		QN		NA		NA	с 	NA		NA		NA
			TPHG		ND		ND		DN		NA		NA		NA		NA		NA
		mg/Kg	Xylenes		ND		DN		DN		NA		NA		NA		NA		NA
			E-Benzene		DN		DN		ND		NA		AN		NA		NA		AN
			Toluene		DN		Q		DN		AN		NA		A		A		AN
			Benzene		QN		Q		DN		AN		AN		AN		AN		NA
Chloride	<b>Field Test</b>	(mg/L)			A		A		AN		A		AN		A		136	1	126
		(ft) (			0.25		0.25		0.25		0.5		0.5		0.5		m		3
	Sample Depth	No.			SS-1		SS-2	1	SS-3		SS-1	I	SS-2		SS-3		SS-1		S5-2
	Date	Sampled		1	9.30.15		9.30.15		9.30.15		11.17.15		11.17.15		11.17.15		1.27.16		1.2/.16

<sup>1</sup> Boyer, 2004, Field Determinations of Chloride in Salt Impacted Soils - Just Add Water ; 11th Annual International Petroleum Environmental Conference

NA - Not Analyzed; ND - Not Detected



Attachment 1

Laboratory Analytical Reports and Chain of Custody Forms

## **Summary Report**

James Allison Resolute Energy 4000 N. Big Spring #500 Midland, TX 79705

Report Date: February 2, 2016

Work Order: 16012805

Project Location: Lea Co, NM Project Name: Shell Maxwell

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
412938	SS-1	soil	2016-01-27	13:00	2016-01-28

#### Sample: 412938 - SS-1

Param	Flag	Result	Units	RL
Chloride		379	mg/Kg	50

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.



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

Lubbock Texas 79424 800-378-1296 El Paso Texas 79922 Texas 79703 Midland Carroliton. Texas 75006 E-Mail lab@traceanalysis com WEB www.traceanalysis.com

Certifications

NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

915-585-3443

432-689-6301

972-242-7750

### Analytical and Quality Control Report

James Allison **Resolute Energy** 4000 N. Big Spring #500 Midland, TX, 79705

WBE HUB

Report Date: February 2, 2016

FAX 806-794-1298

FAX 915-585-4944

FAX 432-689-6313

Work Order: 16012805 

Project Location: Lea Co, NM **Project Name:** Shell Maxwell **Project Number:** Shell Maxwell

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
412938	SS-1	soil	2016-01-27	13:00	2016-01-28

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

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## Case Narrative

Samples for project Shell Maxwell were received by TraceAnalysis, Inc. on 2016-01-28 and assigned to work order 16012805. Samples for work order 16012805 were received intact at a temperature of 5.3 C.

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

		Prep	Prep	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	108286	2016-01-29 at 10:05	127901	2016-02-02 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 16012805 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Work Order: 16012805 Shell Maxwell Page Number: 5 of 11 Lea Co, NM

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# **Analytical Report**

#### Sample: 412938 - SS-1

Laboratory: Analysis: QC Batch: Prep Batch:	alysis: Chloride (Titration) Batch: 127901		al Method: alyzed: Preparation:	SM 4500-Cl B 2016-02-02 2016-02-02	Prep Method: Analyzed By: Prepared By:	'
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			379	mg/Kg	5	50.0

Report Date: February Shell Maxwell	2, 2016	Work Order: 16012805 Shell Maxwell	Page Number: 6 of 11 Lea Co, NM
Method B	lanks		
Method Blank (1)	QC Batch: 127901		

QC Batch: Prep Batch:	127901 108286		Date Analyzed: QC Preparation:		Analyzed By: Prepared By:	
				MDL		
Parameter		Flag	Cert	Result	Units	$\mathbf{RL}$
Chloride	120			<31.9	mg/Kg	50

Work Order: 16012805 Shell Maxwell Page Number: 7 of 11 Lea Co, NM

## Laboratory Control Spikes

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

QC Batch: 127901 Prep Batch: 108286								1 5 5 7 1	•/		
Param		F	СІ	LCS Result	Units	Dil.	Spike Amount		atrix esult	Rec.	Rec. Limit
Chloride				2370	mg/Kg	5	2500	<	160	95	85 - 115
Percent recovery is bas	sed on the spike	resu	lt. RPD	is based o	on the sp	oike and sp	ike duplic	ate res	ult.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2370	mg/Kg	5	2500	<160	95	85 - 115	0	20

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

Work Order: 16012805 Shell Maxwell

# Matrix Spikes

Matrix Spike (MS-1) Spike	ed Sampl	e: 41295	3							
QC Batch: 127901 Prep Batch: 108286			te Analyze Preparat		16-02-02 16-01-29				alyzed By pared By	
Param	F	С	MS Result	Units	Dil.	Spike Amount		atrix esult F	lec.	Rec. Limit
Chloride			2180	mg/Kg	5	2500	<	160	37 78	.9 - 121
Percent recovery is based on the	spike res	ult. RPI	) is based	on the s	spike and s	spike dupli	icate re	sult.		
		MSD			Spike	Matrix		Rec.		RPD
Param	F C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		2280	mg/Kg	5	2500	<160	91	78.9 - 12	1 4	20

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

Work Order: 16012805 Shell Maxwell Page Number: 9 of 11 Lea Co, NM

# **Calibration Standards**

Standard (ICV-1)

QC Batch:	127901			Date A	Analyzed:	2016-02-02		Analy	zed By: AM
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	98.0	98	85 - 115	2016-02-02

#### Standard (CCV-1)

QC Batch:	127901			Date A	Analyzed:	2016-02-02		Analy	zed By: AM
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	_			ıng/Kg	100	102	102	85 - 115	2016-02-02

Work Order: 16012805 Shell Maxwell Page Number: 10 of 11 Lea Co, NM

## 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	<b>TraceAnalysis</b>
-	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

#### Attachments

Work Order: 16012805 Shell Maxwell Page Number: 11 of 11 Lea Co, NM

The scanned attachments will follow this page.

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



Brandon & Clark 3403 Industrial BVd Hobbs, NM 88240 Tel (575) 392-7561 Fax (575) 392-4508 Turn Around Time If different from standard ъ No.) Na, Ca, Mg, K, TDS, EC or Specify Method VO3 - N, NO2 - N, PO4 - P, Alkalinity 'os': 10 **ANALYSIS REQUEST** Moisture Content BioAquatic Testing 2501 Mayes Rd., Ste 100 Carroliton, Texas 75006 Tel (972) 242-7750 Page Dry Weight Basis Required Check If Special Reporting Limits Are Needed Hq ,22T ,008 **TRRP Report Required** Pesticides 8081 / 608 PCB's 8082 / 608 GC/MS Semi. Vol. 8270 / 625 REMARKS GC/MS Vol. 8260 / 624 RCI TCLP Pesticides TCLP Semi Volatiles Circle TCLP Volatiles AB USE ш 200 East Sunset Rd., Suite E El Pasco, Texas 79922 Tel (915) 585-3443 Fax (915) 585-4944 1 (888) 588-3443 ONLY TCLP Metals Ag As Ba Cd Cr Pb Se Hg **MYYN** Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/2007. PAH 8270 / 625 TPH 8015 GRO / DRO / TVHC TPH 418.1 / TX1005 / TX1005 Ext(C35) Carrier # р BTEX 8021/602/8260/624 OBSO. CORO 8021 \ 602 \ 8260 \ 624 **Batm** OBS OBS INST COR INST SOR INST S 13:00 SAMPLING TIME ison a resperency いい 5002 Basin Street, Suite A1 Midland, Texas 79703 Tel (432) 689-6301 Fax (432) 689-6313 Ā Time: 0 Time: Time: 7 Phone #: 432-813-800 **DATE** Date: Date: Date: AP Maxwe PRESERVATIVE NONE ပံ METHOD ICE Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. er Signature: HOBN Company: 1128 Company Company \*OSEH 6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 Tel (806) 794-1296 Fex (806) 794-1298 1 (800) 378-1298 G <sup>2</sup>ONH Colect | ICH E-mail; Fax #: z Received by: 1 SLUDGE 2 à MATRIX eceived AIA #58 TIOS RETAW Time: Time: tnuomA \ emuloV Time: 5 TraceAnalysis, Inc. **# CONTAINERS** 220 LAB Order ID # 1 MO DACO 2 Date: Date: R email: lab@traceanalysis.com ner 0 ides lite FIELD CODE 5 Allisor Company: Company: Company City, Zigl Kosolute (Street, City. Zia) Project Location (including state ł (if different from above) 5 -An Allicon Address 44 Relinquished by: 200 Relinquished by: Relinquished by Contact Parson: Company Nee LAB USE ONLY 2038 Invoice to: Project #: LAB#

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Page Number: 1 of 1

## **Summary Report**

James Allison Resolute Energy 4000 N. Big Spring #500 Midland, TX 79705

Report Date: November 19, 2015

Work Order: 15111817

Project Location: Lea Co, NM Project Name: Shell Maxwell

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
408549	SS 1	soil	2015-11-17	13:15	2015-11-18
408550	SS 2	soil	2015-11-17	13:15	2015-11-18
408551	SS 3	soil	2015-11-17	13:15	2015-11-18

Sample: 408549 - SS 1

Param	Flag	Result	Units	RL
Chloride		3250	mg/Kg	50

#### Sample: 408550 - SS 2

Param	Flag	Result	Units	RL
Chloride		957	mg/Kg	50

#### Sample: 408551 - SS 3

Param	Flag	Result	Units	$\mathbf{RL}$
Chloride		287	mg/Kg	50

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Report Date: October 5, 2015		Work Order: 15093033	Page	Number: 2 of 2
sample 405538 con	tinued			
Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride		4200	mg/Kg 4	

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

RACEA 6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 808 . 794 . 1298 Texas 79922 200 East Sunset Road, Suite E El Paso 915-585-3443 FAX 915-585-4944 5002 Basin Street, Suite A1 Midland. Texas 79703 432-689-6301 FAX 432-689-6313 (BioAquatic) 2501 Mayes Rd., Suite 100 Carroliton. Texas 75006 972-242-7750 E-Mail lab@traceanalysis com WEB www traceanalysis com Certifications WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

## Analytical and Quality Control Report

James Allison Resolute Energy 4000 N. Big Spring #500 Midland, TX, 79705

Report Date: November 19, 2015

Work Order: 15111817

Project Location:Lea Co, NMProject Name:Shell MaxwellProject Number:Shell Maxwell

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
408549	SS 1	soil	2015-11-17	13:15	2015-11-18
408550	SS 2	soil	2015-11-17	13:15	2015-11-18
408551	SS 3	soil	2015-11-17	13:15	2015-11-18

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

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

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## Case Narrative

Samples for project Shell Maxwell were received by TraceAnalysis, Inc. on 2015-11-18 and assigned to work order 15111817. Samples for work order 15111817 were received intact at a temperature of 4.1 C.

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

		Prep	Prep	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	107013	2015-11-19 at 09:40	126453	2015-11-19 at 10:46

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 15111817 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: November 19, 2015Work Order: 15111817Page Number: 5 of 11Shell MaxwellShell MaxwellLea Co, NM

# Analytical Report

#### Sample: 408549 - SS 1

Chloride			3250	mg/Kg	5	50.0
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	107013	Sample I	Preparation:	2015-11-19	Prepared By:	АМ
QC Batch:	126453	Date An	alyzed:	2015-11-19	Analyzed By:	AM
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
Laboratory:	Midland					

#### Sample: 408550 - SS 2

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 126453 107013	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2015-11-19 2015-11-19	Prep Method: Analyzed By: Prepared By:	АM
			$\mathbf{RL}$			
Parameter	Flag	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride			957	mg/Kg	5	50.0

#### Sample: 408551 - SS 3

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 126453 107013	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2015-11-19 2015-11-19	Prep Method: Analyzed By: Prepared By:	
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			287	mg/Kg	5	50.0

Report Date: Novembe Shell Maxwell	r 19, 2015		rder: 15111817 ll Maxwell	P	Page Number: 6 of 11 Lea Co, NM		
Method B	lanks						
Method Blank (1)	QC Batch: 126453						
QC Batch: 126453		Date Analyzed:	2015-11-19		Analyzed By: AM		
Prep Batch: 107013		QC Preparation:	2015-11-19		Prepared By: AM		
			MI	DL			
Parameter	Flag	Cert	Res	ult Un	its RL		
Chloride			<3	1.9 mg/	Kg 50		

Report Date: November 19, 2015 Shell Maxwell Page Number: 7 of 11 Lea Co, NM

## Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	126453 107013	Date Analyzed: 2015-11-19 QC Preparation: 2015-11-19								Analyzed By: AM Prepared By: AM		
Param		F	7	C	LCS Result	Units	Dil.	Spike Amount		atrix esult	Rec.	Rec. Limit
Chloride					2490	mg/Kg	5	2500	<	:160	100	85 - 115
Percent recov	very is based on the s	pike r	esu	lt. RPD LCSD	is based of	on the sj	oike and sp Spike	ike duplic Matrix	ate res	ult. Rec.		RPD
Param		F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride				2200	mg/Kg	5	2500	<160	88	85 - 115	12	20

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

Report Date: November 19, 2015	Work Order: 15111817	Page Number: 8 of 11		
Shell Maxwell	Shell Maxwell	Lea Co, NM		
Matrix Spikes				

Matrix Spik	æ (MS-1)	Spiked Sa	mplo	: 408580	1							
QC Batch: Prep Batch:	126453 107013				e Analyze Preparat		15-11-19 15-11-19				alyzed By epared By	
Param			F	CI	MS Result	Units	Dil.	Spike Amount		atrix esult F	lec.	Rec. Limit
Chloride					59400	mg/Kg	5	2500	57	300	84 78	3.9 - 121
Percent recov	Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.											
				MSD			Spike	Matrix		Rec.		RPD
Param		F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride				59300	mg/Kg	5	2500	57300	80	78.9 - 12	1 0	20

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

Report Date: November 19, 2015 Shell Maxwell Work Order: 15111817 Shell Maxwell

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## **Calibration Standards**

Standard (ICV-1)

QC Batch:	126453			Date A	Analyzed:	2015-11-19		Analy	zed By: AM
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param	_	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2015-11-19

#### Standard (CCV-1)

QC Batch:	126453			Date A	Analyzed:	2015-11-19		Analyzed By: AM		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param	1	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride				mg/Kg	100	100	100	85 - 115	2015-11-19	

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Report Date: November 19, 2015 Shell Maxwell Work Order: 15111817 Shell Maxwell Page Number: 10 of 11 Lea Co, NM

## Appendix

#### **Report Definitions**

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

#### Laboratory Certifications

	Certifying	Certification	Laboratory
C	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

#### **Standard Flags**

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

#### Attachments

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Report Date: November 19, 2015 Shell Maxwell

Work Order: 15111817 Shell Maxwell Page Number: 11 of 11 Lea Co, NM

The scanned attachments will follow this page.

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




### **Summary Report**

James Allison Resolute Energy 4000 N. Big Spring #500 Midland, TX 79705

Report Date: October 5, 2015

Work Order: 15093033

Project Location: Lea Co, NM Project Name: Shell Maxwell

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
405536	SS-1	soil	2015-09-30	13:35	2015-09-30
405537	SS-2	soil	2015-09-30	13:35	2015-09-30
405538	SS-3	soil	2015-09-30	13:35	2015-09-30

		]	TX1005 Extended			
	Benzene	Toluene	Ethylbenzene	Xylene	C6-C12	>C12-C35
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/K≝)
405536 - SS-1	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<50.0
405537 - SS-2	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<50.0
405538 - SS-3	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<50.0

#### Sample: 405536 - SS-1

Param	Flag	Result	Units	$\mathbf{RL}$
Chloride	-	3220	mg/Kg	4

#### Sample: 405537 - SS-2

Param	Flag	Result	Units	RL
Chloride		23700	mg/Kg	4

Sample: 405538 - SS-3

continued ...

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

RACEANAI

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Shell maxwell

915-585-3443 FAX 915-585-4944 FAX 432-689-6313

FAX 806-794-1298

Certifications

WBE HUB NCTRCA DBE NELAP DOD LELAP Kansas Oklahoma ISO 17025

### Analytical and Quality Control Report

James Allison **Resolute Energy** 4000 N. Big Spring #500 Midland, TX, 79705

Report Date: October 5, 2015

Work Order: 15093033 

Project Location: Lea Co, NM Project Name: Shell Maxwell **Project Number:** Shell Maxwell

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
405536	<b>SS-1</b>	soil	2015-09-30	13:35	2015-09-30
405537	SS-2	soil	2015-09-30	13:35	2015-09-30
405538	SS-3	soil	2015-09-30	13:35	2015-09-30

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

Blain Leptu ch

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

## **Report Contents**

Case Narrative	4
Analytical Report   Sample 405536 (SS-1)   Sample 405537 (SS-2)   Sample 405538 (SS-3)	<b>5</b> 5 6 7
Method Blanks   QC Batch 125260 - Method Blank (1)	9 9 9 9
QC Batch 125260 - LCS (1)	L1 11 11 12
QC Batch 125260 - xMS (1) 1   QC Batch 125316 - MS (1) 1	L <b>3</b> 13 13 14
QC Batch 125260 - CCV (2) 1   QC Batch 125260 - CCV (3) 1   QC Batch 125316 - CCV (2) 1   QC Batch 125316 - CCV (3) 1   QC Batch 125321 - CCV (3) 1   QC Batch 125322 - ICV (1) 1	15 15 15 15 16 16
Report Definitions 1   Laboratory Certifications 1   Standard Flags 1	.7 .7 .7 .8

### Case Narrative

Samples for project Shell Maxwell were received by TraceAnalysis, Inc. on 2015-09-30 and assigned to work order 15093033. Samples for work order 15093033 were received intact at a temperature of 6.3 C.

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

		Prep	Prep	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	105983	2015-10-02 at 07:03	125316	2015-10-05 at 08:56
Chloride (Titration)	SM 4500-Cl B	106013	2015-10-05 at 11:35	125322	2015-10-05 at 09:10
TX1005 Extended	TX1005	105946	2015-09-30 at 14:47	125260	2015-10-01 at 09:36

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 15093033 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Report Date: October 5, 2015 Shell Maxwell

#### Work Order: 15093033 Shell Maxwell

Page Number: 5 of 18 Lea Co, NM

## **Analytical Report**

### Sample: 405536 - SS-1

Laboratory: Midland								
Analysis: BTEX		Analytica	l Method:	S 8021F	3		Prep Method	l: S 5035
QC Batch: 125316		Date Ana	lyzed:	2015-10	-05		Analyzed By	r: AK
Prep Batch: 105983		Sample P	reparation:	2015-10	-02		Prepared By	: AK
				RL				
Parameter	Flag	Cert	]	Result	Unit	5	Dilution	$\mathbf{RL}$
Benzene	U	5	<(	0.0200	mg/Kį	ç.	1	0.0200
Toluene	υ	5	<(	0.0200	mg/Kg	g	1	0.0200
Ethylbenzene	υ	5	<(	0.0200	mg/Kg	ξ	1	0.0200
Xylene	U	5	<(	0.0200	mg/Kg	3	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.90	mg/Kg	1	2.00	95	70 - 130
4-Bromofluorobenzene (4-BFB)	·		1.93	mg/Kg	1	2.00	96	70 - 130

#### Sample: 405536 - SS-1

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	125322	Date An	alyzed:	2015-10-05	Analyzed By:	AM
Prep Batch:	106013	Sample l	Preparation:	2015-10-05	Prepared By:	AM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride			3220	mg/Kg	5	4.00

### Sample: 405536 - SS-1

00-012	0	5	<b>\00.0</b>	<u> </u>	continued	00.0
C6-C12	U	5	<50.0	mg/Kg	1	50.0
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
QC Batch: Prep Batch:	125260 105946		nalyzed: Preparation:	2015-10-01 2015-09-30	Analyzed By: Prepared By:	
Laboratory: Analysis:	Midland TX1005 Extended	•	cal Method:	<b>TX1005</b>	Prep Method:	'

continued ...

Report Date: October 5, 2015	Work Order: 15093033	Page Number: 6 of 18
Shell Maxwell	Shell Maxwell	Lea Co, NM

sample 405536 continued ...

					R	Ĺ				
Parameter	Flag		lag	Cert	Resul	t	Units	Dilution	$\mathbf{RL}$	
>C12-C35		U		5	<50.0		mg/Kg	1	50.0	
Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
n-Triacontane n-Octane n-Tricosane	Qar	Qur		61.9 70.7 63.1	mg/Kg mg/Kg mg/Kg	1 1 1 1	50.0 50.0 50.0	124 141 126	70 - 130 70 - 130 70 - 130	

### Sample: 405537 - SS-2

Laboratory:MidlandAnalysis:BTEXQC Batch:125316Prep Batch:105983		Date An	al Method: alyzed: Preparation:	S 8021F 2015-10 2015-10	-05		Prep Methoo Analyzed By Prepared By	r: AK
				$\mathbf{RL}$				
Parameter	Flag	Cert	1	Result	Unit	5	Dilution	$\mathbf{RL}$
Benzene	U	5	<	0.0200	mg/Kg	<u>z</u>	1	0.0200
Toluene	υ	5	<	0.0200	mg/Kg		1	0.0200
Ethylbenzene	U	5	<	0.0200	mg/Kg	5	1	0.0200
Xylene	U	5	<	0.0200	mg/Kg	g	1	0.0200
						Spike	Percent	Recovery
Surrogate	Fla	ig Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)			1.70	mg/Kg	1	2.00	85	70 - 130

### Sample: 405537 - SS-2

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 125322 106013	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2015-10-05 2015-10-05	Prep Method: Analyzed By: Prepared By:	,
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride		·	23700	mg/Kg	5	4.00

Report Date Shell Maxwe	ort Date: October 5, 2015 Work Order: 15093033 Il Maxwell Shell Maxwell				Page Number: 7 of 18 Lea Co, NM				
Sample: 40	5537 - SS	-2							
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TX1005 E 125260 105946	Extended		Date	tical Method: Analyzed: le Preparatior	2015-10-0		Prep Me Analyzed Prepared	l By: AK
					RL	,			
Parameter		F	`lag	Cert	Result	5	Units	Dilution	$\mathbf{RL}$
C6-C12			υ	5	<50.0	) r	ng/Kg	1	50.0
>C12-C35				5	<50.0	) r	ng/Kg	1	50.0
Commo and a		<b>1</b> 71	Gent	Duruk		Dilutio	Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontan	e			62.8	mg/Kg	1	50.0	126	70 - 130
n-Octane	Qar	Qar		70.7	mg/Kg	1	50.0	141	70 - 130
n-Tricosane				61.0	mg/Kg	1	50.0	122	70 - 130

### Sample: 405538 - SS-3

Laboratory: Midland Analysis: BTEX QC Batch: 125316 Prep Batch: 105983		Date Ana	l Method: lyzed: reparation:	S 8021H 2015-10 : 2015-10	-05		Prep Method Analyzed By Prepared By:	: AK
				RL				
Parameter	Flag	Cert		Result	Unit	5	Dilution	$\mathbf{RL}$
Benzene	U	5	<	0.0200	mg/Kj	5	1	0.0200
Toluene	U	5	<	0.0200	mg/Kg		1	0.0200
Ethylbenzene	υ	5	<	0.0200	mg/Kg	g	1	0.0200
Xylene	U	5	<	0.0200	mg/Kį	5	1	0.0200
						Spike	Percent	Recovery
Surrogate	Flag	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.91	mg/Kg	1	2.00	96	70 - 130

### Sample: 405538 - SS-3

Laboratory:					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	125322	Date Analyzed:	2015-10-05	Analyzed By:	AM
Prep Batch:	106013	Sample Preparation:	2015-10-05	Prepared By:	AM

Report Date: October 5, 2015 Shell Maxwell			V	Vork Order: 15 Shell Maxy	Page Number: 8 of 18 Lea Co, NM				
					RI	J			
Parameter		F	Flag	Cert	Result	5	Units	Dilution	$\mathbf{RL}$
Chloride					4200	)	mg/Kg	5	4.00
Sample: 40	5538 - SS	-3							
Laboratory:	Midland								
Analysis:	TX1005 H	Extended		e e	tical Method:	TX1005		Prep Me	thod: N/A
QC Batch:	125260			Date	Analyzed:	2015-10	-01	Analyzeo	l By: AK
Prep Batch:	105946			Samp	le Preparation	: 2015-09-	-30	Prepared	l By: AK
					RL	,			
Parameter		F	Flag	Cert	Result	i	Units	Dilution	$\mathbf{RL}$
C6-C12			υ	5	<50.0	)	mg/Kg	1	50.0
>C12-C35			υ	5	<50.0	)	mg/Kg	1	50.0
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Triacontan	c			59.4	mg/Kg	1	50.0	119	70 - 130
n-Octane	Qsr	Qur		72.0	mg/Kg	1	50.0	144	70 - 130
n-Tricosane				59.0	mg/Kg	1	50.0	118	70 - 130

Report Date: October 5, 2015 W	Vork Order: 15093033	Page Number: 9 of 18
Shell Maxwell	Shell Maxwell	Lea Co, NM

## Method Blanks

Method Blank (1)	QC Ba	tch: 12526	0						
QC Batch: 125260				nalyzed:	2015-10-01			Analyzo	v
Prep Batch: 105946			QC Pre	paration:	2015-09-30			Prepare	ed By: AK
						MDL			
Parameter		Flag		Cert		Result		Units	RL
C6-C12				5		<5.66		mg/Kg	50
>C12-C35				5		<7.50		mg/Kg	50
							Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilutio	on	Amount	Recovery	Limits
n-Triacontane			52.7	mg/Kį	g 1		50.0	105	70 - 130
n-Octane			62.4	mg/Kg	g 1		50.0	125	70 - 130
n-Tricosanc			53.4	mg/K	g 1		50.0	107	70 - 130

### Method Blank (1) QC Batch: 125316

QC Batch: 125316 Prep Batch: 105983			nalyzed: eparation:	2015-10- 2015-10-		Analyzed By: Prepared By:		•
					MDL			
Parameter	Flag		Cert		Result		Units	$\mathbf{RL}$
Benzene			5		< 0.00533	1	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)			1.95	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.83	mg/Kg	1	2.00	92	70 - 130

Method Blank	(1)	QC Batch: 125322
--------------	-----	------------------

QC Batch:	125322	Date Analyzed:	2015-10-05	Analyzed By:	AM
Prep Batch:	106013	QC Preparation:	2015-10-05	Prepared By:	AM

Report Date: October 5, 2015 Shell Maxwell		Work Order: 15 Shell Maxw	Page Number: 10 of 18 Lea Co, NM		
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

Report Date: October 5, 2015Work Order: 15093033Page Number: 11 of 18Shell MaxwellShell MaxwellLea Co, NM

### Laboratory Control Spikes

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

QC Batch:	125260	Date Analyzed:	2015-10-01	Analyzed By:	AK
Prep Batch:	105946	QC Preparation:	2015-09-30	Prepared By:	AK

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	С	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$
C6-C12		5	243	mg/Kg	1	250	< 5.66	97	75 - 125
>C12-C35		5	256	mg/Kg	1	250	<7.50	102	75 - 125

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
C6-C12		5	277	mg/Kg	1	250	< 5.66	111	75 - 125	13	20
>C12-C35		5	242	mg/Kg	1	250	<7.50	97	75 - 125	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
n-Triacontane	57.2	50.7	mg/Kg	1	50.0	114	101	70 - 130
n-Octane	46.4	45.7	mg/Kg	1	50.0	93	91	70 - 130
n-Tricosane	60.2	56.6	mg/Kg	1	50.0	120	113	70 - 130

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

QC Batch: Prep Batch:	125316 105983			Date Analy QC Prepara		5-10-05 5-10-02			Analyzed Prepared	By: AK By: AK
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene			5	2.39	mg/Kg	1	2.00	< 0.00533	120	70 - 130
Toluene			5	2.04	mg/Kg	1	2.00	< 0.00645	102	70 - 130
Ethylbenzene	•		5	1.84	mg/Kg	1	2.00	< 0.0116	92	70 - 130
Xylene			5	5.52	mg/Kg	1	6.00	< 0.00874	92	70 - 130

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

 $continued \dots$ 

Shell Maxwell					Order: Icll Max	15093033 well			Page N	Jumber: Lea	12 of 1 Co, NM
control spikes continued											
		~	LCSD	•• •.		Spike	Matriz		Rec.		RPD
Param	F	C	Result	Units	Dil.	Amount	Result	Rec	. Limit	RPD	Limit
			LCSD			Spike	Matrix	c	Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result			RPD	
Benzene		5	2.37	mg/Kg	1	2.00	< 0.0053				20
Toluene		5	2.03	mg/Kg	1	2.00	< 0.0064				20
Ethylbenzene		5	1.89	mg/Kg	1	2.00	< 0.011	6 94	70 - 130	3	20
Xylene		5	5.57	mg/Kg	1	6.00	< 0.0087	4 93	70 - 130	1	20
Percent recovery is based on the	spike	rest	ılt. RPD	is based	on the s	spike and	spike dup	licate re	sult.		
-	-					-					_
			LC		SD			Spike		CSD	Rec.
Surrogate			Res		sult	Units		nount		Rec.	Limit
Trifluorotoluene (TFT)			1.9			ng/Kg		2.00 2.00			70 - 130
Bromofluorobenzene (4-BFB)			1.9	<b>3</b> 1.1	98 ı	ng/Kg	1	2 1313	96	99	70 - 130
				-		0, 0		2.00			100
Laboratory Control Spike (L QC Batch: 125322 Prep Batch: 106013	<b>CS-</b> 1	.)		Analyzec Preparatic	d: 20	15-10-05 15-10-05		2.00	Anal	yzed By ared By	: AM
QC Batch: 125322 Prep Batch: 106013	CS-1		QC 1	Preparatio LCS	d: 20 on: 20	15-10-05 15-10-05	Spike	e N	Anal Prep Iatrix	yzed By ared By	: AM : AM Rec.
QC Batch: 125322 Prep Batch: 106013 Param	JCS-1	L) F	QC 1	Preparatio LCS Result	d: 20 on: 20 Units	15-10-05 15-10-05 Dil.	Spike	e M nt R	Anal Prep Iatrix Lesult R	yzed By ared By ec.	: AM : AM Rec. Limit
QC Batch: 125322 Prep Batch: 106013 Param Chloride		F	QC 1	Preparatio LCS Result 2730	d: 20 on: 20 Units mg/Kg	15-10-05 15-10-05 Dil. 5 5	Spik Amou 2500	e M nt R	Anal Prep Iatrix Lesult R (19.2 1	yzed By ared By ec.	: AM : AM Rec. Limit
QC Batch: 125322 Prep Batch: 106013 Param Chloride		F	QC 1	Preparatio LCS Result 2730	d: 20 on: 20 Units mg/Kg	15-10-05 15-10-05 Dil. 5 5	Spik Amou 2500	e M nt R	Anal Prep Iatrix Lesult R (19.2 1	yzed By ared By ec.	: AM : AM Rec. Limit
QC Batch: 125322 Prep Batch: 106013 Param Chloride		F	QC I C I	Preparatio LCS Result 2730	d: 20 on: 20 Units mg/Kg	15-10-05 15-10-05 Dil. g 5 pike and s	Spike Amou 2500 spike dupl	e M nt R icate res	Anal Prep Iatrix Lesult R (19.2 1 sult.	yzed By ared By ec.	: AM : AM Rec. Limit 35 - 115
QC Batch: 125322 Prep Batch: 106013 Param Chloride Percent recovery is based on the	spike	F	QC I C I lt. RPD LCSD	Preparation LCS Result 2730 is based of	d: 20 on: 20 Units mg/Kg on the s	15-10-05 15-10-05 Dil. g 5 pike and s Spike	Spike Amou 2500 spike dupl Matrix	e M nt R icate res	Anal Prep Iatrix Lesult R <19.2 1 sult. Rec.	yzed By ared By ecc. 09 {	: AM : AM Rec. Limit 35 - 115 RPD
QC Batch: 125322 Prep Batch: 106013		F	QC I C I	Preparatio LCS Result 2730	d: 20 on: 20 Units mg/Kg on the s Dil.	15-10-05 15-10-05 Dil. g 5 pike and s	Spike Amou 2500 spike dupl Matrix	e M nt R icate res	Anal Prep Iatrix Lesult R (19.2 1 sult.	yzed By ared By ec.	: AM : AM Rec. Limit 35 - 115

Report Date: October 5, 2015	Work Order: 15093033	Page Number: 13 of 18
Shell Maxwell	Shell Maxwell	Lea Co, NM

## Matrix Spikes

#### Matrix Spike (xMS-1) Spiked Sample:

QC Batch:	125260	Date Analyzed:	2015-10-01	Analyzed By:	AK
Prep Batch:	105946	QC Preparation:	2015-09-30	Prepared By:	AK

		MS			Spike	Matrix		Rec.
F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
	5	293	mg/Kg	1	250	< 5.66	117	75 - 125
	5	252	mg/Kg	1	250	<7.50	101	75 - 125
	F	F C 5 5	F C Result 5 293	F C Result Units 5 293 mg/Kg	F C Result Units Dil. 5 293 mg/Kg 1	F C Result Units Dil. Amount 5 293 mg/Kg 1 250	F C Result Units Dil. Amount Result 5 293 mg/Kg 1 250 <5.66	F C Result Units Dil. Amount Result Rec. <sup>5</sup> 293 mg/Kg 1 250 <5.66 117

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

				MSD			Spike	Matrix		Rec.		RPD
Param		F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
C6-C12	Q۴	Qs	5	335	mg/Kg	1	250	< 5.66	134	75 - 125	13	20
>C12-C35			5	258	mg/Kg	1	250	<7.50	103	75 - 125	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Triacontane	52.6	55.7	mg/Kg	1	50	105	111	70 - 130
n-Octane	44.5	45.6	mg/Kg	1	50	89	91	70 - 130
n-Tricosane	55.4	59.8	mg/Kg	1	50	111	120	70 - 130

Matrix Spike (M	<b>1S-1)</b> Spiked	Sample: 405449
-----------------	---------------------	----------------

QC Batch: Prep Batch:	125316 105983		Date Analyzed:2015-10-05QC Preparation:2015-10-02						Analyzed By: AF Prepared By: AF		
Param		F	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	
Benzene			5	1.82	mg/Kg	1	2.00	< 0.00533	91	70 - 130	

Benzene	5	1.82	mg/Kg	1	2.00	< 0.00533	91	70 - 130
Toluene	5	1.72	mg/Kg	1	2.00	< 0.00645	86	70 - 130
Ethylbenzene	5	1.74	mg/Kg	1	2.00	< 0.0116	87	70 - 130
Xylene	5	5.08	mg/Kg	1	6.00	< 0.00874	85	70 - 130

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

Report Date: October 5, 2015 Shell Maxwell					Order: nell Ma	15093033 xwell			Page 1	Number: Lea	14 of 1 Co, NM
matrix spikes continued						_					
P.	-	~	MSD		<b>D</b> .1	Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
			MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	
Benzene		5	1.89	mg/Kg	1	2.00	< 0.0053	3 94	70 - 130	) 4	20
Toluene		5	1.84	mg/Kg	1	2.00	< 0.0064	5 92	70 - 130	) 7	20
Ethylbenzene		5	1.79	mg/Kg	1	2.00	<0.0116	<b>90</b>	70 - 130	) 3	20
Kylene		5	5.43	mg/Kg	1	6.00	<0.0087	4 90	70 - 130	) 7	20
Percent recovery is based on the	spike	e resi				spike and	spike dupl	icate res	ult.		
					ISD			Spike		MSD	Rec.
Surrogate					sult	Units		mount		Rec.	Limit
Trifluorotoluene (TFT)					.76	mg/Kg	1	2	90		70 - 130
-Bromofluorobenzene (4-BFB)			1.	98 1	.86	ıng/Kg	1	2	99	93	70 - 130
QC Batch: 125322 Prep Batch: 106013		-	QC	e Analyze Preparatio MS	on: 20	015-10-05 015-10-05	Spike	Mat	Prep	lyzed By bared By	: AM Rec.
QC Batch: 125322 Prep Batch: 106013 Param		mple F	Date QC	Preparatio MS tesult	on: 20 Units	015-10-05 Dil.	Amount	Res	Prep rix ult Re	ec.	: AM Rec. Limit
OC Batch: 125322 Prep Batch: 106013 Param Chloride		F	Date QC	Preparatio MS tesult 3320	on: 20 Units mg/Kg	Dil5-10-05 Dil. 5 5	Amount 2500	Res 68	Prep rix ult Re 3 10	ec.	: AM Rec. Limit
OC Batch: 125322 Prep Batch: 106013 Param Chloride		F	Date QC	Preparatio MS tesult 3320	on: 20 Units mg/Kg	Dil5-10-05 Dil. 5 5	Amount 2500	Res 68	Prep rix ult Re 3 10	ec.	: AM Rec. Limit
QC Batch: 125322 Prep Batch: 106013		F	Date QC C F 	Preparatio MS tesult 3320	on: 20 Units mg/Kg	Di5-10-05 Dil. 5 5 spike and s Spike	Amount 2500	Res 68	Prop rix ult Re 3 10 ılt. Rec.	ec.	: AM Rec.
2C Batch: 125322 Prep Batch: 106013 Param Phloride		F	Date QC C F	Preparatio MS tesult 3320	on: 20 Units mg/Kg	Di5-10-05 Dil. 5 5 spike and s	Amount 2500 spike dupli	Res 68	Prep rix ult Re <u>3 10</u> ılt.	ec.	: AM Rec. Limit 3.9 - 121

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

Report Date: October 5, 2015	Work Order: 15093033	Page Number: 15 of 18
Shell Maxwell	Shell Maxwell	Lea Co, NM

### **Calibration Standards**

Standard (CCV-2)

QC Batch: 12	5260		Date A	nalyzed: 2	015-10-01		Analy	zed By: AK
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12 >C12-C35		5 ð	mg/Kg mg/Kg	250 250	285 234	114 94	75 - 125 75 - 125	2015-10-01 2015-10-01

### Standard (CCV-3)

QC Batch: 1252	260		Date A	nalyzed: 2	015-10-01		Analy	zed By: AK
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12	0	5	mg/Kg	250	298	119	75 - 125	2015-10-01
>C12-C35		5	mg/Kg	250	244	98	75 - 125	2015-10-01

### Standard (CCV-2)

QC Batch: 125316			Date An	alyzed: 20	Analyzed By: AK			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		5	mg/kg	0.100	0.114	114	80 - 120	2015-10-05
Toluene		5	mg/kg	0.100	0.0975	98	80 - 120	2015-10-05
Ethylbenzene		5	mg/kg	0.100	0.0919	92	80 - 120	2015-10-05
Xylene		5	mg/kg	0.300	0.267	89	80 - 120	2015-10-05

Standard (CCV-3)

QC Batch: 125316

Date Analyzed: 2015-10-05

Analyzed By: AK

Report Date: October 5, 2015 Shell Maxwell			W	ork Order: Shell Ma	Page Number: 16 of 18 Lea Co, NM			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		5	mg/kg	0.100	0.114	114	80 - 120	2015-10-05
Toluene		5	mg/kg	0.100	0.0988	99	80 - 120	2015-10-05
Ethylbenzene		5	mg/kg	0.100	0.0904	90	80 - 120	2015-10-05
Xylene		5	mg/kg	0.300	0.266	89	80 - 120	2015-10-05

### Standard (ICV-1)

QC Batch:	125322			Date A	nalyzed:	2015-10-05		Analy	zed By: AM
					ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	1	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	98.0	98	85 - 115	2015-10-05

### Standard (CCV-1)

QC Batch:	125322			Date A	Analyzed:	2015-10-05		Analy	zed By: AM
2	_				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	F	lag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	102	102	85 - 115	2015-10-05

Report Date: October 5, 2015 Shell Maxwell Work Order: 15093033 Shell Maxwell Page Number: 17 of 18 Lea Co, NM

### 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.

Report Date: October 5, 2015	Work Order: 15093033	Page Number: 18 of 18
Shell Maxwell	Shell Maxwell	Lea Co, NM
F Description Qsr Surrogate recovery outside of laboratory l	imits.	_ 3

### Attachments

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

U The analyte is not detected above the SDL



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Attachment 2

**State Engineer Water Well Records** 



		(quarte	ers are 1=	NW 2	NE 3=	SW 4=SE	)		
		(quar	ters are s	malles	t to larg	jest)	(NAD83 UT	M in meters)	
P	OD Number	Q64 ·	Q16 Q4	Sec	Tws	Rng	Х	Y	
L	00328 POD10	3	33	27	14S	37E	668336	3660474	<b>(</b> )
Driller License:	854								
Driller Name:	KIDD, GARY								
Drill Start Date:	03/20/2006	Drill Finis	sh Date	:	03/2	26/2006	Plug	Date:	
Log File Date:	04/11/2006	PCW Rcv	/ Date:		05/0	)1/2008	Sour	ce:	Shallow
Pump Type:	SUBMER	Pipe Disc	charge	Size:	4		Estir	nated Yiel	d: 150 GPM
Casing Size:	10.00	Depth We	ell:		220	feet	Dept	h Water:	115 feet
Wate	er Bearing Stratifi	cations:	Тор	Bott	om	Descrip	tion		
			115	:	220	Sandsto	ne/Gravel	/Conglome	rate
	Casing Perf	orations:	Тор	Bott	om				
			121		220				



		••				SW 4=SE	•	••••••••••••••••••••••••••••••••••••••	
P	OD Number	••	rters are : Q16 Q4					M in meters) Y	
L	00328 POD11	4	2 3			37E	669050	3660868	<b></b>
Driller License:	854								
Driller Name:	GARY KIDD								
Drill Start Date:	06/11/2007	Drill Fini	sh Date	<b>:</b> :	06/:	29/2007	Plug	Date:	
Log File Date:	07/24/2007	PCW Rev	v Date:		03/	10/2009	Sour	ce:	Shallow
Pump Type:	SUBMER	Pipe Dise	charge	Size:	5		Estir	nated Yiel	d: 450 GPM
Casing Size:	14.00	Depth W	ell:		235	i feet	Dept	h Water:	111 feet
Wat	er Bearing Stratif	ications:	Тор	Bott	om	Descrip	tion		
			111	:	234	Sandsto	ne/Gravel	/Conglome	rate
	Casing Perf	orations:	Тор	Bott	om				
			135		235				



		••				SW 4=SE	•		
		••	ters are s				•	TM in meters)	
P	OD Number	Q64	Q16 Q4			-	X	Y	-
L	00328 POD6		2 3	27	14S	37E	668920	3660906*	
Driller License:	854								
Driller Name:	GARY KIDD								
Drill Start Date:	04/01/1994	Drill Finis	sh Date	<b>:</b> :	04/0	)9/1994	Plug	Date:	
Log File Date:	06/08/1994	PCW Rcv	/ Date:		01/0	)4/1995	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe Disc	charge	Size:	8		Estii	mated Yiel	l <b>d:</b> 700 GPM
Casing Size:	14.00	Depth W	ell:		182	feet	Dept	th Water:	102 feet
Wate	er Bearing Strati	fications:	Тор	Bott	om	Descrip	tion		
			102		182	Sandsto	ne/Gravel	/Conglome	erate
	Casing Per	forations:	Тор	Bott	om	e			
			100		182				

\*UTM location was derived from PLSS - see Heip



			ers are 1= rters are s			SW 4=SE		TM in meters	
	POD Number		Q16 Q4				X	Y	•
	L 00328 POD7		1 3	27	14S	37E	668517	3660900	•
Driller License	e: 854								
Driller Name:	GARY KIDD								
Drill Start Date	e: 04/20/1995	Drill Fini	sh Date	:	04/2	29/1995	Plug	Date:	
Log File Date:	05/24/1995	PCW Rev	v Date:		05/0	03/1995	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe Disc	charge	Size:	8		Esti	mated Yie	ld: 800 GPM
Casing Size:	14.00	Depth W	ell:		203	feet	Dep	th Water:	107 feet
Wa	ter Bearing Strati	fications:	Тор	Botto	m	Descrip	tion		
			107	2	03	Sandsto	ne/Grave	/Conglome	erate
	Casing Per	forations:	Тор	Botto	m				
			83	2	03				

\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



		(quarte	ers are 1=	=NW 2=	NE 3=	SW 4=SE	)			
		(quar	ters are s	mailes	to larg	gest)	(NAD83 U	TM in meter	rs)	
P	OD Number	Q64	Q16 Q4	Sec	Tws	Rng	Х		Y	
L	00328 POD9	3	33	27	14S	37E	668424	3660397	7* 🎱	
Driller License:	854									
Driller Name:	GARY KIDD									
Drill Start Date:	02/20/2001	Drill Finis	sh Date	:	02/2	27/2001	Plug	Date:		
Log File Date:	04/17/2002	PCW Rcv	/ Date:		04/ <sup>,</sup>	17/2002	Sou	rce:	Sha	allow
Pump Type:	TURBIN	Pipe Disc	charge	Size:	8		Esti	mated Yi	<b>eld:</b> 600	) GPM
Casing Size:	14.00	Depth W	ell:		194	feet	Dep	th Water:	: 104	feet
Wate	er Bearing Strati	fications:	Тор	Bott	om	Descrip	tion			
			104		194	Sandsto	ne/Grave	/Conglon	nerate	
	Casing Per	forations:	Тор	Bott	om					
			104		194					

\*UTM location was derived from PLSS - see Help



		(	quarte	ers are	ə 1=	NW 2=	NE 3=	SW 4=SE	3)		
			(quart	ters a	re sr	nallesi	to lare	gest)	(NAD83 U	TM in meters)	
PC	DD Number	(	Q64 (	Q16 (	Q4	Sec	Tws	Rng	Х	Y	
L	00328 S3			3	3	27	14S	37E	668525	3660498*	0
Driller License:	124									34 	
Driller Name:	M.L. FULLINGIM										
Drill Start Date:	12/01/1965	Drill	Finis	sh Da	ate:	:	12/0	04/1965	Plug	Date:	
Log File Date:	12/10/1965	PCW	Rcv	Dat	e:		10/ <sup>.</sup>	13/1966	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe	Disc	har	ge S	Size:			Esti	mated Yiel	d: 800 GPM
Casing Size:		Dept	h We	ell:			135	feet	Dep	th Water:	62 feet
Wate	r Bearing Stratific	ation	s:	Тс	op	Bott	om	Descrip	tion		
				(	62		102	Sandsto	one/Grave	l/Conglome	rate
				1	05		135	Sandsto	one/Grave	l/Conglome	rate

\*UTM location was derived from PLSS - see Help



L (	<b>D Number</b> 00695		••		Q4	Sec	to larg Tws		X	۲M in meters) ۲	
L (		(	<b>264 (</b> 1					Rng			
_	00695		1	1	2	~ 7					
Driller License:				•	2	27	14S	37E	669206	3661816*	<b></b>
	322			-							
Driller Name:	GRADY BACKUS										
Drill Start Date:	03/15/1971	Drill	Finis	h D	ate:		03/2	25/1971	Plug	Date:	
Log File Date:	05/03/1971	PCW	Rcv	Dat	e:		04/2	5/1949	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe	Disc	har	ge S	Size:			Estir	nated Yiel	d:
Casing Size:	10.00	Dept	h We	ell:			110	feet	Dept	th Water:	72 feet

\*UTM location was derived from PLSS - see Help



						SW 4=SE	)		
		(quart	ers are s	mailest	to larg	gest)	(NAD83 U	TM in meters	)
I	POD Number	Q64 C	216 Q4	Sec	Tws	Rng	Х	١	ſ
I	L 00695 S		2	27	14S	37E	669516	3661516	* 🎱
Driller License	: 854								
Driller Name:	GARY KIDD								
Drill Start Date	: 01/07/1998	<b>Drill Finis</b>	h Date	:	01/ <sup>,</sup>	12/1998	Plug	Date:	
Log File Date:	02/26/1998	PCW Rcv	Date:		08/	16/2000	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe Disc	harge	Size:	8		Esti	mated Yie	ld: 650 GPM
Casing Size:	14.00	Depth We	11:		238	feet	Dept	th Water:	105 feet
Wa	ter Bearing Strati	fications:	Тор	Bott	om	Descrip	tion		
			134		87	Sandsto	ne/Grave	/Conglom	erate
	Casing Per	forations:	Тор	Bott	om				
			128	2	238				

\*UTM location was derived from PLSS - see Help

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						SW 4=SE			
_		••	rters are			• •	•	TM in meters	
P	OD Number	Q64	Q16 Q4	Sec	Tws	Rng	Х	Ŷ	
L	00740 S	1	34	27	14S	37E	669230	3660609	•
Driller License:	1498								
Driller Name:	ROBINSON, B.J.								
Drill Start Date:	03/30/2004	Drill Fini	ish Date	:	04/	05/2004	Plug	Date:	
Log File Date:	04/13/2004	PCW Rc	v Date:		11/	14/1956	Sou	rce:	Shallow
Pump Type:	TURBIN	Pipe Dis	charge	Size:			Esti	mated Yie	ld: 800 GPM
Casing Size:	10.75	Depth W	ell:		246	i feet	Dep	th Water:	112 feet
Wate	er Bearing Stratific	ations:	Тор	Bott	tom	Descrip	tion		
			147		160	Sandsto	ne/Grave	l/Conglome	erate
-			195		241	Sandsto	ne/Grave	l/Conglome	erate
	Casing Perfo	rations:	Тор	Bott	om				
			116		246				

\*UTM location was derived from PLSS - see Help



	(quarte	ers are 1	=NW 2=	=NE 3=	SW 4=SE	)		
	(quai	ters are	smalles	t to lar	gest)	(NAD83 U	TM in meters)	1
OD Number	Q64	Q16 Q4	Sec	Tws	Rng	Х	Y	1.00
01334		4 4	27	14S	37E	669733	3660516*	· 🎱
46								
ABBOTT, MUR	RELL							
12/22/1951	Drill Finis	sh Date	<b>:</b> :	12/2	23/1951	Plug	Date:	07/20/1952
01/04/1952	PCW Rcv	/ Date:		01/2	23/1953	Sou	rce:	Shallow
	Pipe Disc	charge	Size:			Esti	mated Yie	d: <sup>≈</sup>
6.63	Depth W	eli:		103	feet	Dep	th Water:	50 feet
er Bearing Strati	fications:	Тор	Bott	om	Descrip	tion		
		52		103	Sandsto	ne/Grave	l/Conglome	erate
Casing Per	forations:	Тор	Bott	om				
		80		103				
	46 ABBOTT, MUR 12/22/1951 01/04/1952 6.63 er Bearing Stratif	OD Number Q64 01334 46 ABBOTT, MURRELL 12/22/1951 Drill Finis 01/04/1952 PCW Row Pipe Dise	(quarters are s OD Number 01334 4 46 ABBOTT, MURRELL 12/22/1951 01/04/1952 PCW Rcv Date: Pipe Discharge 6.63 Depth Well: Er Bearing Stratifications: Top 52	(quarters are smalles)   OD Number Q64 Q16 Q4 Sec   01334 4 4 27   46 ABBOTT, MURRELL 12/22/1951 Drill Finish Date: 01/04/1952 PCW Rcv Date: Pipe Discharge Size: 6.63 Depth Well:   er Bearing Stratifications: Top Bott 52   Casing Perforations: Top Bott	(quarters are smallest to large Q64 Q16 Q4 Sec Tws 01334OD Number 01334Q64 Q16 Q4 Sec Tws 4442746 ABBOTT, MURRELL12/22/195112/22/1951Drill Finish Date:12/201/04/1952PCW Rcv Date:01/2Pipe Discharge Size:6.63Depth Well:103er Bearing Stratifications:Top Bottom 52103Casing Perforations:Top Bottom	(quarters are smallest to largest)OD NumberQ64 Q16 Q4Sec Tws Rng01334442714S37E46ABBOTT, MURRELL12/22/1951Drill Finish Date:12/23/195101/04/1952PCW Rcv Date:01/23/1953Pipe Discharge Size:6.63Depth Well:103 feetTop Bottom Descrip52103SandstoCasing Perforations:Top Bottom	(quarters are smallest to largest)(NAD83 UT)OD NumberQ64 Q16 Q4 Sec Tws RngX01334442714S37E66973346ABBOTT, MURRELL12/22/1951Drill Finish Date:12/23/1951Plug01/04/1952PCW Rcv Date:01/23/1953SourPipe Discharge Size:Estin6.63Depth Well:103 feetDepter Bearing Stratifications:TopBottomDescription52103Sandstone/GravelCasing Perforations:	OD Number Q64 Q16 Q4 Sec Tws Rng X Y   01334 4 4 27 14S 37E 669733 3660516*   46   ABBOTT, MURRELL   12/22/1951 Drill Finish Date: 12/23/1951 Plug Date:   01/04/1952 PCW Rcv Date: 01/23/1953 Source:   Pipe Discharge Size: Estimated Yiel   6.63 Depth Well: 103 feet Depth Water:   er Bearing Stratifications: Top Bottom Description   52 103 Sandstone/Gravel/Conglome   Casing Perforations:

\*UTM location was derived from PLSS - see Help



. . . . . . . . . . . . . . . . .

Driller License: 46	umber 36 POD1	(quarters are si Q64 Q16 Q4 4 4	mallest to larges Sec Tws R 27 14S 3	ng X	Ý
L 016				•	<b>Y</b> 0516* 🌍
Driller License: 46	36 POD1	4 4	27 14S 3	7E 669733 366	0516* 🎱
Driller Name: ME					
	RRELL ABBOTT				
Drill Start Date: 12/2	23/1952 <b>Dril</b>	Finish Date	: 12/24/	1952 Plug Date	e: 03/14/1953
Log File Date: 01/0	02/1953 PCV	V Rcv Date:	01/02/	1953 <b>Source:</b>	Shallow
Pump Type:	Pipe	Discharge	Size:	Estimate	d Yield:
Casing Size:	Dep	th Well:	115 fe	et Depth Wa	ater: 50 feet

\*UTM location was derived from PLSS - see Help



						=SW 4=SE		The in motors)			
	POD Number	•••	(quarters are smallest to larges Q64 Q16 Q4 Sec Tws F								
I	_ 01839 POD1	3	2 4			37E	669624	3660818*	<b></b>		
Driller License	: 90										
Driller Name:	BETHEL, H.R.										
Drill Start Date	: 01/28/1953	Drill Fini	sh Dat	e:	01/	29/1953	Plug	Date:	07/01/1953		
Log File Date:	11/09/1953	PCW Rc	v Date:		02/	18/1953	Sou	rce:	Shallow		
Pump Type:		Pipe Dis	charge	Size:			Estimated Yield:				
Casing Size:	7.00	Depth W	ell:		83	feet	Dep	th Water:	45 feet		
Wa	ter Bearing Stratifi	cations:	Тор	Bott	om	Descrip	tion				
			45		83	Sandsto	ne/Grave	l/Conglome	rate		
	Casing Perf	orations:	Тор	Bott	om						
			45		83						

\*UTM location was derived from PLSS - see Help



		(quarters are 1=NW 2	=NE 3=SW 4=SE	i)	
		(quarters are smalle	st to largest)	(NAD83 UTM in meters)	
P	OD Number	Q64 Q16 Q4 Sec	: Tws Rng	X Y	
L	02294	27	14S 37E	669128 3661101*	<b>()</b>
Driller License:	99				
Driller Name:	MUSSELWHITE,	0.R.			
Drill Start Date:	08/06/1953	Drill Finish Date:	08/06/1953	Plug Date:	01/04/1954
Log File Date:	08/10/1953	PCW Rcv Date:	06/17/1954	Source:	Shallow
Pump Type:		Pipe Discharge Size	:	Estimated Yiel	d:
Casing Size:	6.63	Depth Well:	120 feet	Depth Water:	50 feet
\A/	n Doorin n Chuchifia			4!	
vvate	r Bearing Stratific	ations: Top Bot	tom Descrip	tion	
		65	120 Sandsto	ne/Gravel/Conglome	rate

\*UTM location was derived from PLSS - see Help



		(quarter	rs are 1=	NW 2	=NE 3=	SW 4=SE			
		(quarte	ers are s	mailes	t to larg	jest)	(NAD83 UT	TM in meters)	)
P	OD Number	Q64 Q	Sec	X					
L	02305		31	27	14S	37E	668509	3661303*	O
Driller License:	144								
Driller Name:	QUARLES, J.R.								
Drill Start Date:	07/24/1953	Drill Finisl	h Date	:	07/2	25/1953	Plug	Date:	
Log File Date:	09/25/1953	PCW Rcv	Date:		11/24/1954		Source:		Shallow
Pump Type:		Pipe Discl	harge	Size:			Estir	mated Yiel	d:
Casing Size:		Depth We	Depth Well:		100 feet		Dept	th Water:	60 feet

\*UTM location was derived from PLSS - see Help



		••				=NE 3= t to larg	SW 4=SE	•	TM in meters)	
Р	OD Number	••					Rng		Y Will Meters	
L	02627	4		4			37E		3660415*	<b>(</b> )
Driller License:	33									
Driller Name:	TATUM, CLAUD	EE.								
Drill Start Date:	08/13/1954	Drill Fi	nish [	Date	:	08/*	13/1954	Plug	Date:	10/25/195
Log File Date:	09/27/1954	PCW R	cv Da	ate:		12/2	20/1954	54 Source:		Shallow
Pump Type:		Pipe Di	scha	rge	Size:			Estir	nated Yiel	d:
Casing Size:		Depth \	Nell:			110	feet	Dept	th Water:	40 feet

\*UTM location was derived from PLSS - see Help

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		••	ters are 1 rters are			=SW 4=SE gest)		TM in meters)	
P	OD Number	Q64	Q16 Q4	4 Sec	Tws	Rng	Х	Y	
L	02731		2 2	27	14S	37E	669710	3661723*	<b></b>
Driller License:	46								
Driller Name:	MURRELL ABB	ΟΤΤ							
Drill Start Date:	12/30/1954	Drill Fini	sh Dat	e:	12/3	30/1954	Plug	Date:	05/10/1955
Log File Date:	01/19/1955	PCW Rc	v Date:		01/	19/1955	Sou	rce:	Shallow
Pump Type:		Pipe Dis	charge	Size:			Estimated Yield:		
Casing Size:	7.00	Depth W	ell:		115	5 feet	Dep	th Water:	70 feet
Wate	er Bearing Stratif	ications:	Тор	Bott	om	Descrip	tion		
			70		115	Sandsto	ne/Grave	l/Conglome	rate
	Casing Per	orations:	Тор	Bott	om				
			70	, .	115				

\*UTM location was derived from PLSS - see Help



		••				SW 4=SE	,		
_	OD Number		rters are s				•	TM in meters	•
PC	Q64	Sec	Sec Tws Rng		X		Y		
L	10920		1 1	27	14S	37E	668501	3661705	* 🎱
Driller License:	1332								
Driller Name:	ROOT, FRED D.								
Drill Start Date:	01/23/1999	Drill Fini	sh Date	:	01/:	23/1999	Plug	Date:	
Log File Date:	02/24/1999	PCW Rcv Date:				Sou	rce:	Shallow	
Pump Type:		Pipe Dis	charge	Size:			Esti	mated Yie	d: 35 GPM
Casing Size:	5.75	Depth W	ell:		158	l feet	Dep	th Water:	70 feet
Wate	er Bearing Stratific	ations:	Тор	Bott	om	Descrip	tion		
			70		158	Other/Ur	nknown		
	Casing Perfo	orations:	Тор	Bott	om				
			118		158				

\*UTM location was derived from PLSS - see Help



Attachment 3

NMOCD Form C-141



Attachment 3

NMOCD Form C-141

Resolute Natural Resources Company, LLC 1700 Lincoln Street, Suite 2800, Denver, CO 80203 Voice: 303.534.4600 Fax: 303.623.3628 Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

Release Notification and Corrective Action													
						OPERA	TOR	E	] Initia	al Report	$\boxtimes$	Final Report	
Name of C	ompany: l	Resolute Nat	ural Resc	urces Co, LLC		Contact: Patrick Flynn							
Address: 1	700 Linco	In Street Sui	te 2800, I	Denver, CO 802	03	Telephone No. 303.534.4600 X1145							
Facility Na	me: Shell	Maxwell No	Battery		Facility Typ	e: Tank Batter	у						
Surface Owner Mineral Owner API No.: 30-025								.: 30-025-0	05164				
LOCATION OF RELEASE													
Unit Letter	Section 27	Township 14S	Range 37E	Feet from the	North/					County Lea			
<u> </u>	P	·	1	Latitude: 33.073	354N	Longitu	ıde: 103.18503	W			_		
				NAT	URE	OF REL	EASE						
		ed water and				Volume of	Release: 10 Bbl	V	/olume R	ecovered: 1	0 Bbl v	vater	
		oded steel wat	er line			Date and H	lour of Occurrence			Hour of Disc 3:27 PM	covery:		
Was Immedi	Was Immediate Notice Given?												

Image: Second state of the second s

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

Corrosion of steel water line connected to SWD well injection manifold caused pinhole leak. The well was shut in, the line repaired, and a vac truck used to collect the fluids. Fluids were contained to the tank battery pad by the location berm. See attached report for additional details.

Describe Area Affected and Cleanup Action Taken.\*

All released fluids were contained within the berm. A vacuum truck was used to recover most of the fluid released. The recovered water was taken to the Gandy Marley facility for disposal. Approximately 34 cubic yards of affected pea gravel and soil was excavated for offsite disposal at the Gandy Marley landfarm. See attached report for additional information, including confirmation soil sample analytical results.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

172	OIL CONSE	OIL CONSERVATION DIVISION						
Signature: Printed Name: Patrick Flynn	Approved by Environmental Specialist:							
Title: Vice President	Approval Date: 02/08/2016	Expiration Date: ///						
E-mail Address: pflynn@resoluteenergy.com	Conditions of Approval:	Attached						
Date: 2/5/16 Phone: 303.534.4600 X1145		1RP 3879						