



Robert Grubbs Jr.
Senior Environmental Coordinator

November 10, 2015

Oil Conservation Division
District 2 – Artesia
811 S. First St.
Artesia, NM 88210

Re: Marauder Federal #1H
30-015-38244
Sec. 31, T19S-R31E
Eddy County, NM

Mr. Bratcher,

COG Operating LLC would like to submit for your consideration the closure documents for the above captioned well. The letter is in response to the C-141 Initial report dated January 16, 2015.

The release was caused when a problem occurred at the battery that lead to fluid coming out of the flare. The situation was remediated by repairing the defective equipment at the battery. This area was addressed with an application of soapy water and microblaze to the vegetation. Soil samples were taken on May 7, 2015; results indicated all constituents were within RRALs outlined in *OCD Guidelines Leaks, Spills and Releases (1993)* recommended for a site ranking of zero (0).

COG Operating LLC is requesting closure of this incident. If you have, any additional questions or concerns please feel free to contact me (432-661-6601).

Sincerely,

Robert Grubbs Jr.

Enclosed

- (1) C-141 Final
- (2) C-141 Initial (Copy)
- (3) Site Diagram
- (4) Laboratory Analysis

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☒ Final Report

Name of Company: COG Operating LLC	Contact: Robert McNeill	
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077	
Facility Name: Marauder Federal #1H	Facility Type: Battery	
Surface Owner: Federal	Mineral Owner:	API No. 30-015-38244

LOCATION OF RELEASE

Unit Letter D	Section 31	Township 19S	Range 31E	Feet from the 330	North/South Line North	Feet from the 660	East/West Line West	County Eddy
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Latitude 32.6231450328974 Longitude -103.914919290024

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 15 bbls Oil; 10 bbls PW	Volume Recovered: 0 bbls Oil; 0 bbls PW
Source of Release: Flare	Date and Hour of Occurrence: 1/1/2015 12:00 am	Date and Hour of Discovery: 1/1/2015 12:00 am
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 Watercourse was Impacted, Describe Fully.*

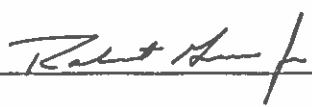
Describe Cause of Problem and Remedial Action Taken.*

This release was caused by a problem at the battery that lead to fluid coming out the flare. Soapy water and Microblaze was applied to the impacted pasture and vegetation.

Describe Area Affected and Cleanup Action Taken.*

The impacted area is located adjacent to battery and is approximately 300' x 600' in size. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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

Signature: 	OIL CONSERVATION DIVISION		
Printed Name: Robert Grubbs Jr	Approved by Environmental Specialist:		
Title: Senior Environmental Coordinator	Approval Date:	Expiration Date:	
E-mail Address: rgrubbs@concho.com	Conditions of Approval:		Attached ☐
Date: November 10, 2015	Phone: 432-661-6601		

* Attach Additional Sheets If Necessary

District I
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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 August 8, 2011

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: Marauder Federal #1H	Facility Type: Battery

Surface Owner: Federal	Mineral Owner:	API No. 30-015-38244
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LOCATION OF RELEASE

Unit Letter D	Section 31	Township 19S	Range 31E	Feet from the 330	North/South Line North	Feet from the 660	East/West Line West	County Eddy
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Latitude 32.6231450328974 Longitude -103.914919290024

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 15 bbls Oil; 10 bbls PW	Volume Recovered: 0 bbls Oil; 0 bbls PW
Source of Release: Flare	Date and Hour of Occurrence: 1/1/2015 12:00 am	Date and Hour of Discovery: 1/1/2015 12:00 am
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 Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

This release was caused by a problem at the battery that lead to fluid coming out the flare. Soapy water and Microblaze was applied to the impacted pasture and vegetation.

Describe Area Affected and Cleanup Action Taken.*

The impacted area is located adjacent to battery and is approximately 300' x 600' in size. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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

Signature: 	OIL CONSERVATION DIVISION		
Printed Name: Amanda Trujillo	Approved by Environmental Specialist:		
Title: Senior Environmental Coordinator	Approval Date:	Expiration Date:	
E-mail Address: atrujillo@concho.com	Conditions of Approval:		Attached ☐
Date: January 16, 2015	Phone: 575-748-6940		

* Attach Additional Sheets If Necessary

October 13 2015

Marauder Federal #1



Site Ranking: Zero					
Depth to GW per SEO: 500'					
T-1	DRO	GRO	TPH	BTEX	CI-
0-1'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
2'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
3'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
T-2	DRO	GRO	TPH	BTEX	CI-
0-1'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
2'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
3'	< 50.0	< 4.00	< 50.0	< 0.200	< 20.0
Bold values exceed RRALs per NMOC Guidelines					



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1296
200 East Sunset Road, Suite E El Paso, Texas 79922 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 Carrollton, 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

Robert Grubbs
COG Operating, LLC
550 W. Texas Avenue
Suite 100
Midland, TX, 79701

Report Date: May 20, 2015

Work Order: 15051126



Project Location: Eddy Co, NM
Project Name: Marauder Federal #1
Project Number: Marauder Federal #1

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
393030	T-1 0-1'	soil	2015-05-07	00:00	2015-05-11
393031	T-1 2'	soil	2015-05-07	00:00	2015-05-11
393032	T-1 3'	soil	2015-05-07	00:00	2015-05-11
393033	T-2 0-1'	soil	2015-05-07	00:00	2015-05-11
393034	T-2 2'	soil	2015-05-07	00:00	2015-05-11
393035	T-2 3'	soil	2015-05-07	00:00	2015-05-11

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

A handwritten signature in black ink, reading "Blair Leftwich". The signature is written in a cursive style with a prominent flourish at the end. Below the signature is a horizontal line.

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

Report Contents

Case Narrative	4
Analytical Report	5
Sample 393030 (T-1 0-1')	5
Sample 393031 (T-1 2')	6
Sample 393032 (T-1 3')	7
Sample 393033 (T-2 0-1')	9
Sample 393034 (T-2 2')	10
Sample 393035 (T-2 3')	12
Method Blanks	14
QC Batch 121465 - Method Blank (1)	14
QC Batch 121544 - Method Blank (1)	14
QC Batch 121545 - Method Blank (1)	14
QC Batch 121668 - Method Blank (1)	15
Laboratory Control Spikes	16
QC Batch 121465 - LCS (1)	16
QC Batch 121544 - LCS (1)	16
QC Batch 121545 - LCS (1)	17
QC Batch 121668 - LCS (1)	17
Matrix Spikes	18
QC Batch 121465 - xMS (1)	18
QC Batch 121544 - MS (1)	18
QC Batch 121545 - MS (1)	19
QC Batch 121668 - MS (1)	19
Calibration Standards	20
QC Batch 121465 - CCV (1)	20
QC Batch 121465 - CCV (2)	20
QC Batch 121465 - CCV (3)	20
QC Batch 121544 - CCV (1)	20
QC Batch 121544 - CCV (2)	21
QC Batch 121544 - CCV (3)	21
QC Batch 121545 - CCV (1)	21
QC Batch 121545 - CCV (2)	21
QC Batch 121545 - CCV (3)	22
QC Batch 121668 - ICV (1)	22
QC Batch 121668 - CCV (1)	22
Appendix	23
Report Definitions	23
Laboratory Certifications	23
Standard Flags	23
Attachments	23

Case Narrative

Samples for project Marauder Federal #1 were received by TraceAnalysis, Inc. on 2015-05-11 and assigned to work order 15051126. Samples for work order 15051126 were received intact at a temperature of 5.6 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	102812	2015-05-14 at 11:35	121544	2015-05-15 at 08:41
Chloride (Titration)	SM 4500-Cl B	102912	2015-05-19 at 12:10	121668	2015-05-20 at 08:50
TPH DRO - NEW	S 8015 D	102773	2015-05-12 at 17:00	121465	2015-05-13 at 08:29
TPH GRO	S 8015 D	102812	2015-05-14 at 11:35	121545	2015-05-15 at 08:47

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 15051126 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: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 5 of 24
Eddy Co, NM

Analytical Report

Sample: 393030 - T-1 0-1'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.10	mg/Kg	1	2.00	105	70 - 130
4-Bromofluorobenzene (4-BFB)			1.97	mg/Kg	1	2.00	98	70 - 130

Sample: 393030 - T-1 0-1'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 121668
Prep Batch: 102912

Analytical Method: SM 4500-Cl B
Date Analyzed: 2015-05-20
Sample Preparation: 2015-05-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393030 - T-1 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 121465
Prep Batch: 102773

Analytical Method: S 8015 D
Date Analyzed: 2015-05-13
Sample Preparation: 2015-05-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 6 of 24
Eddy Co, NM

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			86.2	mg/Kg	1	100	86	70 - 130

Sample: 393030 - T-1 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 121545
Prep Batch: 102812

Analytical Method: S 8015 D
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.79	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.84	mg/Kg	1	2.00	92	70 - 130

Sample: 393031 - T-1 2'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	70 - 130
4-Bromofluorobenzene (4-BFB)			2.10	mg/Kg	1	2.00	105	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 7 of 24
Eddy Co, NM

Sample: 393031 - T-1 2'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 121668 Date Analyzed: 2015-05-20 Analyzed By: AK
Prep Batch: 102912 Sample Preparation: 2015-05-19 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393031 - T-1 2'

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 121465 Date Analyzed: 2015-05-13 Analyzed By: SC
Prep Batch: 102773 Sample Preparation: 2015-05-12 Prepared By: SC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			84.1	mg/Kg	1	100	84	70 - 130

Sample: 393031 - T-1 2'

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 121545 Date Analyzed: 2015-05-15 Analyzed By: AK
Prep Batch: 102812 Sample Preparation: 2015-05-14 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.91	mg/Kg	1	2.00	96	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 8 of 24
Eddy Co, NM

Sample: 393032 - T-1 3'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.26	mg/Kg	1	2.00	113	70 - 130
4-Bromofluorobenzene (4-BFB)			2.07	mg/Kg	1	2.00	104	70 - 130

Sample: 393032 - T-1 3'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 121668
Prep Batch: 102912

Analytical Method: SM 4500-Cl B
Date Analyzed: 2015-05-20
Sample Preparation: 2015-05-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393032 - T-1 3'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 121465
Prep Batch: 102773

Analytical Method: S 8015 D
Date Analyzed: 2015-05-13
Sample Preparation: 2015-05-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			79.3	mg/Kg	1	100	79	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 9 of 24
Eddy Co, NM

Sample: 393032 - T-1 3'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 121545
Prep Batch: 102812

Analytical Method: S 8015 D
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	z	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1	2.00	94	70 - 130

Sample: 393033 - T-2 0-1'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.08	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1	2.00	96	70 - 130

Sample: 393033 - T-2 0-1'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 121668
Prep Batch: 102912

Analytical Method: SM 4500-Cl B
Date Analyzed: 2015-05-20
Sample Preparation: 2015-05-19

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

continued ...

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 10 of 24
Eddy Co, NM

sample 393033 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393033 - T-2 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 121465
Prep Batch: 102773

Analytical Method: S 8015 D
Date Analyzed: 2015-05-13
Sample Preparation: 2015-05-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			91.5	mg/Kg	1	100	92	70 - 130

Sample: 393033 - T-2 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 121545
Prep Batch: 102812

Analytical Method: S 8015 D
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.78	mg/Kg	1	2.00	89	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 11 of 24
Eddy Co, NM

Sample: 393034 - T-2 2'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.19	mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			1.87	mg/Kg	1	2.00	94	70 - 130

Sample: 393034 - T-2 2'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 121668
Prep Batch: 102912

Analytical Method: SM 4500-Cl B
Date Analyzed: 2015-05-20
Sample Preparation: 2015-05-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393034 - T-2 2'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 121465
Prep Batch: 102773

Analytical Method: S 8015 D
Date Analyzed: 2015-05-13
Sample Preparation: 2015-05-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			98.0	mg/Kg	1	100	98	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 12 of 24
Eddy Co, NM

Sample: 393034 - T-2 2'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 121545
Prep Batch: 102812

Analytical Method: S 8015 D
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	2	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.78	mg/Kg	1	2.00	89	70 - 130
4-Bromofluorobenzene (4-BFB)			1.71	mg/Kg	1	2.00	86	70 - 130

Sample: 393035 - T-2 3'

Laboratory: Midland
Analysis: BTEX
QC Batch: 121544
Prep Batch: 102812

Analytical Method: S 8021B
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.33	mg/Kg	1	2.00	116	70 - 130
4-Bromofluorobenzene (4-BFB)			2.05	mg/Kg	1	2.00	102	70 - 130

Sample: 393035 - T-2 3'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 121668
Prep Batch: 102912

Analytical Method: SM 4500-Cl B
Date Analyzed: 2015-05-20
Sample Preparation: 2015-05-19

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

continued . . .

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 13 of 24
Eddy Co, NM

sample 393035 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 393035 - T-2 3'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 121465
Prep Batch: 102773

Analytical Method: S 8015 D
Date Analyzed: 2015-05-13
Sample Preparation: 2015-05-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	z	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			86.4	mg/Kg	1	100	86	70 - 130

Sample: 393035 - T-2 3'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 121545
Prep Batch: 102812

Analytical Method: S 8015 D
Date Analyzed: 2015-05-15
Sample Preparation: 2015-05-14

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	z	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1	2.00	96	70 - 130

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 14 of 24
Eddy Co, NM

Method Blanks

Method Blank (1) QC Batch: 121465

QC Batch: 121465
Prep Batch: 102773

Date Analyzed: 2015-05-13
QC Preparation: 2015-05-12

Analyzed By: SC
Prepared By: SC

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		2	<7.41	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			101	mg/Kg	1	100	101	70 - 130

Method Blank (1) QC Batch: 121544

QC Batch: 121544
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		2	<0.00533	mg/Kg	0.02
Toluene		2	<0.00645	mg/Kg	0.02
Ethylbenzene		2	<0.0116	mg/Kg	0.02
Xylene		2	<0.00874	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.28	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)			2.04	mg/Kg	1	2.00	102	70 - 130

Method Blank (1) QC Batch: 121545

QC Batch: 121545
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 15 of 24
Eddy Co, NM

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		2	<2.32	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.89	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.91	mg/Kg	1	2.00	96	70 - 130

Method Blank (1) QC Batch: 121668

QC Batch: 121668
Prep Batch: 102912

Date Analyzed: 2015-05-20
QC Preparation: 2015-05-19

Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 16 of 24
Eddy Co, NM

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 121465
Prep Batch: 102773

Date Analyzed: 2015-05-13
QC Preparation: 2015-05-12

Analyzed By: SC
Prepared By: SC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		2	235	mg/Kg	1	250	<7.41	94	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		2	249	mg/Kg	1	250	<7.41	100	70 - 130	6	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	100	107	mg/Kg	1	100	100	107	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 121544
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		2	2.16	mg/Kg	1	2.00	<0.00533	108	70 - 130
Toluene		2	1.92	mg/Kg	1	2.00	<0.00645	96	70 - 130
Ethylbenzene		2	1.86	mg/Kg	1	2.00	<0.0116	93	70 - 130
Xylene		2	5.58	mg/Kg	1	6.00	<0.00874	93	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		2	2.17	mg/Kg	1	2.00	<0.00533	108	70 - 130	0	20
Toluene		2	1.89	mg/Kg	1	2.00	<0.00645	94	70 - 130	2	20
Ethylbenzene		2	1.87	mg/Kg	1	2.00	<0.0116	94	70 - 130	0	20
Xylene		2	5.53	mg/Kg	1	6.00	<0.00874	92	70 - 130	1	20

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

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 17 of 24
Eddy Co, NM

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.20	2.26	mg/Kg	1	2.00	110	113	70 - 130
4-Bromofluorobenzene (4-BFB)	1.92	1.93	mg/Kg	1	2.00	96	96	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 121545
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		2	14.0	mg/Kg	1	20.0	<2.32	70	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD Limit
GRO		2	16.1	mg/Kg	1	20.0	<2.32	80	70 - 130	14

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.92	1.92	mg/Kg	1	2.00	96	96	70 - 130
4-Bromofluorobenzene (4-BFB)	2.03	2.02	mg/Kg	1	2.00	102	101	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 121668
Prep Batch: 102912

Date Analyzed: 2015-05-20
QC Preparation: 2015-05-19

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2370	mg/Kg	5	2500	<19.2	95	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD Limit
Chloride			2460	mg/Kg	5	2500	<19.2	98	85 - 115	4

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

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 18 of 24
Eddy Co, NM

Matrix Spikes

Matrix Spike (xMS-1) Spiked Sample: 393110

QC Batch: 121465
Prep Batch: 102773

Date Analyzed: 2015-05-13
QC Preparation: 2015-05-12

Analyzed By: SC
Prepared By: SC

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		2	216	mg/Kg	1	250	16.4	80	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		2	242	mg/Kg	1	250	16.4	90	70 - 130	11	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	99.9	104	mg/Kg	1	100	100	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 393029

QC Batch: 121544
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		2	2.25	mg/Kg	1	2.00	<0.00533	112	70 - 130
Toluene		2	2.03	mg/Kg	1	2.00	<0.00645	102	70 - 130
Ethylbenzene		2	2.09	mg/Kg	1	2.00	<0.0116	104	70 - 130
Xylene		2	6.20	mg/Kg	1	6.00	<0.00874	103	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		2	2.18	mg/Kg	1	2.00	<0.00533	109	70 - 130	3	20
Toluene		2	2.01	mg/Kg	1	2.00	<0.00645	100	70 - 130	1	20
Ethylbenzene		2	2.04	mg/Kg	1	2.00	<0.0116	102	70 - 130	2	20
Xylene		2	6.07	mg/Kg	1	6.00	<0.00874	101	70 - 130	2	20

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

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 19 of 24
Eddy Co, NM

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.17	2.24	mg/Kg	1	2	108	112	70 - 130
4-Bromofluorobenzene (4-BFB)	2.12	2.07	mg/Kg	1	2	106	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 393029

QC Batch: 121545
Prep Batch: 102812

Date Analyzed: 2015-05-15
QC Preparation: 2015-05-14

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		2	14.1	mg/Kg	1	20.0	<2.32	70	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		2	14.5	mg/Kg	1	20.0	<2.32	72	70 - 130	3	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.70	1.83	mg/Kg	1	2	85	92	70 - 130
4-Bromofluorobenzene (4-BFB)	1.88	1.97	mg/Kg	1	2	94	98	70 - 130

Matrix Spike (MS-1) Spiked Sample: 393034

QC Batch: 121668
Prep Batch: 102912

Date Analyzed: 2015-05-20
QC Preparation: 2015-05-19

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2460	mg/Kg	5	2500	<19.2	98	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2650	mg/Kg	5	2500	<19.2	106	78.9 - 121	7	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 121465

Date Analyzed: 2015-05-13

Analyzed By: SC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	244	98	80 - 120	2015-05-13

Standard (CCV-2)

QC Batch: 121465

Date Analyzed: 2015-05-13

Analyzed By: SC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	225	90	80 - 120	2015-05-13

Standard (CCV-3)

QC Batch: 121465

Date Analyzed: 2015-05-13

Analyzed By: SC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	258	103	80 - 120	2015-05-13

Standard (CCV-1)

QC Batch: 121544

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.106	106	80 - 120	2015-05-15
Toluene		2	mg/kg	0.100	0.0931	93	80 - 120	2015-05-15

continued ...

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 21 of 24
Eddy Co, NM

standard continued ...

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ethylbenzene		2	mg/kg	0.100	0.0911	91	80 - 120	2015-05-15
Xylene		2	mg/kg	0.300	0.269	90	80 - 120	2015-05-15

Standard (CCV-2)

QC Batch: 121544

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.111	111	80 - 120	2015-05-15
Toluene		2	mg/kg	0.100	0.0977	98	80 - 120	2015-05-15
Ethylbenzene		2	mg/kg	0.100	0.0972	97	80 - 120	2015-05-15
Xylene		2	mg/kg	0.300	0.283	94	80 - 120	2015-05-15

Standard (CCV-3)

QC Batch: 121544

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.115	115	80 - 120	2015-05-15
Toluene		2	mg/kg	0.100	0.101	101	80 - 120	2015-05-15
Ethylbenzene		2	mg/kg	0.100	0.0984	98	80 - 120	2015-05-15
Xylene		2	mg/kg	0.300	0.287	96	80 - 120	2015-05-15

Standard (CCV-1)

QC Batch: 121545

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	0.797	80	80 - 120	2015-05-15

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 22 of 24
Eddy Co, NM

Standard (CCV-2)

QC Batch: 121545

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	0.968	97	80 - 120	2015-05-15

Standard (CCV-3)

QC Batch: 121545

Date Analyzed: 2015-05-15

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	0.880	88	80 - 120	2015-05-15

Standard (ICV-1)

QC Batch: 121668

Date Analyzed: 2015-05-20

Analyzed By: AK

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2015-05-20

Standard (CCV-1)

QC Batch: 121668

Date Analyzed: 2015-05-20

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2015-05-20

Appendix

Report Definitions

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

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	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

Report Date: May 20, 2015
Marauder Federal #1

Work Order: 15051126
Marauder Federal #1

Page Number: 24 of 24
Eddy Co, NM

Attachments

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

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Submittal of samples constitutes agreement to Terms and Conditions

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