



Kerr-McGee Oil & Gas Onshore LP  
1099 18<sup>th</sup> Street, Suite 1800  
Denver, Colorado 80202  
720-929-6000 Fax 720-929-7000

December 15, 2016

Mr. Rick Allison  
Colorado Oil & Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**Re: Sump Closure Summary Letter Report  
Cummings 65N67W/19NWNW  
API: 05-123-27398  
Facility ID: 302237  
NWNW Sec 19-T5N-R67W  
COGCC Remediation #8961**

Dear Mr. Allison:

Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) has prepared this Sump Closure Summary Letter Report (Report) to document sampling activities and the results of environmental testing at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure of Produced Water Vessels, which has been assigned Remediation #8961 by the COGCC. Apex Companies, LLC (Apex) provided the environmental services at the site that included collection of confirmation soil samples from the excavation and documentation of field activities, as described below.

### **Site Assessment Activities**

The field activities described herein were performed with the purpose of assessing potential hydrocarbon impacts at the site related to the closure of the produced water sump on April 28, 2016. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided on Figure 1.

The final extent of the excavation measured approximately 15 feet by 15 feet with an approximate depth of 6 feet below ground surface (bgs). No impacted soils were encountered in the excavation during closure activities. A liner was not present below the tanks, and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the base and sidewalls of the excavation area at approximately 6 feet and 4 feet bgs, respectively. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the base (Base 1 @ 6') of the excavation area was submitted to Origins Laboratory in Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum

hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260, and TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), and pH. Soil analytical data is summarized in Table 1 and the laboratory analytical report is provided in Attachment A.

## Results

Soil analytical results from soil sample Base 1@6' indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining four soil samples collected from the sidewalls of the excavation area were not submitted for laboratory analysis as analytical data confirmed the absence of petroleum hydrocarbon impacts above regulatory standards.

## Conclusions

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards in the former sump location. Consequently, no further site assessment or remedial activity is necessary. Prior to site assessment activities, the produced water sump was permanently removed. The excavation area was backfilled and contoured to match pre-existing site conditions.

Please contact me at (720) 929-4306 if you have any questions regarding this report or require additional information.

Sincerely,

Kerr-McGee Oil & Gas Onshore, LP



Erik Mickelson

Senior HSE Representative

## Attachments:

Table 1 – Soil Sample Results Summary Table

Figure 1 – Site Map

Attachment A – Laboratory Analytical Reports

**TABLE 1**  
**Cummings 65N67W/19NWNW**  
**SOIL SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date	Depth (ft. bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH- GRO (mg/kg)	TEPH- DRO (mg/kg)	TEPH- ORO (mg/kg)	EC (mmhos/cm)	pH (units)
<b>COGCC standards for soil (mg/kg) <sup>(1)</sup></b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>			<b>4 mmhos/cm or 2x BG</b>	<b>6-9</b>
Base 1 @6'	04/28/16	6	<0.05	<0.05	<0.05	<0.05	<5.0	<50	<200	0.194	8.36

**Notes:**

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective January 1, 2015.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

TVPH - GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH - DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH - ORO = Total extractable petroleum hydrocarbons - oil range organics

EC = Electrical conductivity

BG = Background

mmhos/cm = Millimhos per centimeter






mg/kg = Milligrams per kilogram.

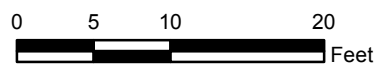
ft. bgs = Feet below ground surface.

**BOLD** = Analytical result is in exceedance of COGCC Table 910-1 soil standards.



### Legend

-  Soil Sample Location
-  Removed Infrastructure
-  Existing Infrastructure
-  Berm
-  Excavation Extent



Notes:  
All locations are approximate unless otherwise noted.

B- Benzene  
TPH- Total Petroleum Hydrocarbons  
mg/kg- Milligrams Per Kilogram



Figure 1  
Site Map  
CUMMINGS 65N67WW19NWNW  
NWNW Sec 19-T5N-R67W  
Weld County, Colorado

Scale: 1:150

Date: 6/20/2016

Projection:

Author: HSE GIS

NAD 1983 State Plane Colorado  
North FIPS 0501 (US Feet)

**Attachment A**

**Laboratory Analytical Reports**



April 29, 2016

Apex Companies, LLC

Jake Hildebrand

3240 W. 71st Avenue, Suite 1

Westminster CO 80030

**Project Name - KMG - Cummings 65N67W  
19NWNW**

**Project Number - [none]**

Attached are your analytical results for KMG - Cummings 65N67W 19NWNW received by Origins Laboratory, Inc. April 28, 2016. This project is associated with Origins project number X604313-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Apex Companies, LLC

3240 W. 71st Avenue, Suite 1

Westminster CO 80030

Jake Hildebrand

Project Number: [none]

Project: KMG - Cummings 65N67W 19NWNW

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Base 1 @ 6'	X604313-01	Soil	April 28, 2016 10:01	04/28/2016 14:44

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

www.originslaboratory.com

page 1 of 1

ORIGINS  
LABORATORY, INC

Client: Apex Companies  
Address: 1760 Cole Blvd  
Lakewood, CO 80401  
Telephone Number: 970.903.1260  
Email Address: Jake.Hildebrand@apexcos.com \*Bill to Anadarko

Project Manager: Jacob Hildebrand  
Project Name: Cummings 65N67W 19NWNW  
Project Number: (Erik Mickelson)  
Samples Collected By: John Hickey

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis				Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa	Other	Geotex	Drillcore	Ec		PH
Base 1 @ 6'	4/28/16	1001	2	X					X				X	X	X	Hold SAR
West 1 @ 4'		1002	1													Hold
East 1 @ 4'		1003	1													
North 1 @ 4'		1004	1													
South 1 @ 4'		1005	1													
Background		1010	1													

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
Jake Hildebrand	4/28/16	1444	Jake Hildebrand	4/28/16	1444	Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>

Temp Received: 6.0

Date Results Needed 4/29 7 AM

Origins Laboratory, Inc.

Jake Pellegrini

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Apex Companies, LLC  
3240 W. 71st Avenue, Suite 2  
Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

Origins Laboratory

F-012207-01-R1  
Effective Date: 01/09/12

## Sample Receipt Checklist

Origins Work Order: X604313

Client: Apex Companies

Client Project ID: Cummings 65N67W 19NWNW

Checklist Completed by: Jake Hildebrand

Shipped Via: UPS

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 4/28/16 1446

Airbill #: 254

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: \_\_\_\_\_

Cooler Number/Temperature: 1 16.0 °C 1 °C 1 °C (Describe) 1 °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PH</u>
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) (pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by: [Signature] (Project Manager)

Date/Time Reviewed: 4/28/16

Origins Laboratory, Inc.

Jake Pellegrini

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Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Base 1 @ 6'**

**4/28/2016 10:01:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X604313-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	B6D2801	04/28/2016	04/28/2016	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	"	"	U

Surrogate: o-Terphenyl 80.4 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	5.0	mg/kg	25	B6D2803	04/28/2016	04/28/2016	U
Benzene	ND	0.05	"	"	"	"	"	U
Toluene	ND	0.05	"	"	"	"	"	U
Ethylbenzene	ND	0.05	"	"	"	"	"	U
Xylenes, total	ND	0.05	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 93.8 % 70-130 " " "  
Surrogate: Toluene-d8 99.9 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 89.1 % 70-130 " " "

**pH in Soil by EPA 9045D**

pH	8.36		pH Units	1	B6D2804	04/28/2016	04/28/2016	
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**Specific Conductance by Modified 9050A**

Specific Conductance (EC)	0.194		mmhos/cm	"	B6D2805	"	04/28/2016	
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Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2803 - EPA 5030 (soil)</b>										
<b>Blank (B6D2803-BLK1)</b>					Prepared: 04/28/2016 Analyzed: 04/28/2016					
Gasoline Range Hydrocarbons	ND	0.20	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		96.8	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.2	70-130			

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Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2803 - EPA 5030 (soil)</b>										
<b>Blank (B6D2803-BLK2)</b>					Prepared: 04/28/2016 Analyzed: 04/28/2016					
Gasoline Range Hydrocarbons	ND	0.20	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		95.7	70-130			
Surrogate: Toluene-d8	65		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.6	70-130			

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Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2803 - EPA 5030 (soil)</b>										
<b>LCS (B6D2803-BS1)</b>					Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.09	0.002	mg/kg	0.100		85.2	77.1-124			
Toluene	0.08	0.002	"	0.100		84.0	74.5-128			
Ethylbenzene	0.09	0.002	"	0.100		85.4	66.4-127			
m,p-Xylene	0.17	0.004	"	0.200		84.2	76.6-124			
o-Xylene	0.08	0.002	"	0.100		81.6	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	56		ug/kg	62.5		89.3	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.3	70-130			

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Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2803 - EPA 5030 (soil)</b>										
<b>LCS (B6D2803-BS2)</b>					Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.09	0.002	mg/kg	0.100		92.9	77.1-124			
Toluene	0.09	0.002	"	0.100		92.7	74.5-128			
Ethylbenzene	0.09	0.002	"	0.100		93.3	66.4-127			
m,p-Xylene	0.19	0.004	"	0.200		92.5	76.6-124			
o-Xylene	0.09	0.002	"	0.100		89.7	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	55		ug/kg	62.5		88.4	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.5	70-130			

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**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B6D2803 - EPA 5030 (soil)**

Matrix Spike (B6D2803-MS1)		Source: X604309-02			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.10	0.002	mg/kg	0.100	ND	95.8	71.8-126			
Toluene	0.09	0.002	"	0.100	ND	94.3	65.1-130			
Ethylbenzene	0.10	0.002	"	0.100	ND	95.4	62.2-130			
m,p-Xylene	0.19	0.004	"	0.200	ND	89.1	46.5-137			
o-Xylene	0.09	0.002	"	0.100	ND	92.6	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	54		ug/kg	62.5		86.5	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.4	70-130			

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Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B6D2803 - EPA 5030 (soil)**

Matrix Spike (B6D2803-MS2)		Source: X604309-05			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.10	0.002	mg/kg	0.100	ND	102	71.8-126			
Toluene	0.10	0.002	"	0.100	ND	101	65.1-130			
Ethylbenzene	0.10	0.002	"	0.100	ND	103	62.2-130			
m,p-Xylene	0.20	0.004	"	0.200	ND	101	46.5-137			
o-Xylene	0.10	0.002	"	0.100	ND	99.8	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	55		ug/kg	62.5		87.3	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.5	70-130			

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3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B6D2803 - EPA 5030 (soil)**

Matrix Spike Dup (B6D2803-MSD1)		Source: X604309-02			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.09	0.002	mg/kg	0.100	ND	90.4	71.8-126	5.82	11.3	
Toluene	0.09	0.002	"	0.100	ND	88.2	65.1-130	6.64	15.4	
Ethylbenzene	0.09	0.002	"	0.100	ND	88.6	62.2-130	7.41	19.6	
m,p-Xylene	0.18	0.004	"	0.200	ND	83.1	46.5-137	6.50	19.2	
o-Xylene	0.09	0.002	"	0.100	ND	87.5	54.2-134	5.73	17.9	
Surrogate: 1,2-Dichloroethane-d4	55		ug/kg	62.5		88.0	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		95.8	70-130			

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3240 W. 71st Avenue, Suite 1  
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Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B6D2803 - EPA 5030 (soil)**

Matrix Spike Dup (B6D2803-MSD2)		Source: X604309-05			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Benzene	0.08	0.002	mg/kg	0.100	ND	80.9	71.8-126	23.4	11.3	QR-02
Toluene	0.08	0.002	"	0.100	ND	80.5	65.1-130	22.2	15.4	QR-02
Ethylbenzene	0.08	0.002	"	0.100	ND	81.1	62.2-130	23.5	19.6	QR-02
m,p-Xylene	0.16	0.004	"	0.200	ND	80.8	46.5-137	22.6	19.2	QR-02
o-Xylene	0.08	0.002	"	0.100	ND	79.7	54.2-134	22.4	17.9	QR-02
Surrogate: 1,2-Dichloroethane-d4	55		ug/kg	62.5		88.7	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.7	70-130			

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Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

Jake Hildebrand  
Project Number: [none]  
Project: KMG - Cummings 65N67W 19NWNW

## Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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## Extractable Petroleum Hydrocarbons by 8015C - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch B6D2801 - EPA 3580

#### Blank (B6D2801-BLK1)

Prepared: 04/28/2016 Analyzed: 04/28/2016

Diesel (C10-C28)	ND	50	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	42		"	50.0		83.5	59-131			

#### Blank (B6D2801-BLK2)

Prepared: 04/28/2016 Analyzed: 04/28/2016

Diesel (C10-C28)	ND	50	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	45		"	50.0		90.1	59-131			

#### LCS (B6D2801-BS1)

Prepared: 04/28/2016 Analyzed: 04/28/2016

Diesel (C10-C28)	820	50	mg/kg	1000		82.5	64-121			
Residual Range Organics (C28-C40)	990	200	"	1000		99.4	58-124			
Surrogate: o-Terphenyl	40		"	50.0		80.6	59-131			

#### LCS (B6D2801-BS2)

Prepared: 04/28/2016 Analyzed: 04/28/2016

Diesel (C10-C28)	980	50	mg/kg	1000		97.7	64-121			
Residual Range Organics (C28-C40)	1100	200	"	1000		113	58-124			
Surrogate: o-Terphenyl	51		"	50.0		102	59-131			

#### Matrix Spike (B6D2801-MS1)

Source: X604292-02

Prepared: 04/28/2016 Analyzed: 04/28/2016

Diesel (C10-C28)	710	50	mg/kg	1000	ND	71.2	53-125			
Residual Range Organics (C28-C40)	830	200	"	1000	53	77.9	47-133			

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Project: KMG - Cummings 65N67W 19NWNW

## Extractable Petroleum Hydrocarbons by 8015C - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2801 - EPA 3580</b>										
<b>Matrix Spike (B6D2801-MS1)</b>		<b>Source: X604292-02</b>			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Surrogate: o-Terphenyl	37		mg/kg	50.0		74.6	59-131			
<b>Matrix Spike (B6D2801-MS2)</b>		<b>Source: X604317-01</b>			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Diesel (C10-C28)	830	50	mg/kg	1000	ND	82.8	53-125			
Residual Range Organics (C28-C40)	920	200	"	1000	65	85.5	47-133			
Surrogate: o-Terphenyl	40		"	50.0		79.6	59-131			
<b>Matrix Spike Dup (B6D2801-MSD1)</b>		<b>Source: X604292-02</b>			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Diesel (C10-C28)	780	50	mg/kg	1000	ND	77.6	53-125	8.63	20	
Residual Range Organics (C28-C40)	920	200	"	1000	53	86.5	47-133	10.5	20	
Surrogate: o-Terphenyl	41		"	50.0		81.2	59-131			
<b>Matrix Spike Dup (B6D2801-MSD2)</b>		<b>Source: X604317-01</b>			Prepared: 04/28/2016 Analyzed: 04/28/2016					
Diesel (C10-C28)	920	50	mg/kg	1000	ND	92.4	53-125	11.0	20	
Residual Range Organics (C28-C40)	1100	200	"	1000	65	98.7	47-133	14.4	20	
Surrogate: o-Terphenyl	50		"	50.0		99.3	59-131			

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## Classical Chemistry Parameters - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B6D2804 - NO PREP</b>										
<b>Duplicate (B6D2804-DUP1)</b>	<b>Source: X604313-01</b>				Prepared: 04/28/2016 Analyzed: 04/28/2016					
pH	8.39		pH Units		8.36			0.358	25	
<b>Duplicate (B6D2804-DUP2)</b>	<b>Source: X604315-01</b>				Prepared: 04/28/2016 Analyzed: 04/28/2016					
pH	8.15		pH Units		8.06			1.11	25	
<b>Batch B6D2805 - NO PREP</b>										
<b>Blank (B6D2805-BLK1)</b>	Prepared: 04/28/2016 Analyzed: 04/28/2016									
Specific Conductance (EC)	0.00260		mmhos/cm							
<b>Blank (B6D2805-BLK2)</b>	Prepared: 04/28/2016 Analyzed: 04/28/2016									
Specific Conductance (EC)	0.00290		mmhos/cm							
<b>Duplicate (B6D2805-DUP1)</b>	<b>Source: X604313-01</b>				Prepared: 04/28/2016 Analyzed: 04/28/2016					
Specific Conductance (EC)	0.194		mmhos/cm		0.194			0.103	25	
<b>Duplicate (B6D2805-DUP2)</b>	<b>Source: X604315-01</b>				Prepared: 04/28/2016 Analyzed: 04/28/2016					
Specific Conductance (EC)	0.0667		mmhos/cm		0.0664			0.451	25	

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### Notes and Definitions

U Sample is Non-Detect.

QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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