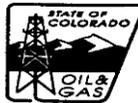


State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

- Spill or Release, Plug & Abandon, Central Facility Closure, Site/Facility Closure, Other (describe):

OGCC Employee:
Spill, Complaint, Inspection, NOAV, Tracking No:

GENERAL INFORMATION

OGCC Operator Number: 47120
Name of Operator: Kerr-McGee Oil and Gas Onshore, LP
Address: 1099 18th Street, Suite 1800
City: Denver State: CO Zip: 80202
Contact Name and Telephone: Name: Phillip Hamlin, No: 970-336-3500, Fax: 970-336-3656
API/Facility No: 05-123-19963
County: Weld
Facility Name:
Facility Number:
Well Name: HSR-Grant Brothers
Well Number: 10-31
Location (QtrQtr, Sec, Twp, Rng, Meridian): NESE S31 T2N R67W
Latitude: 40.091582 Longitude: -104.924528

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Crude Oil and Produced Water
Site Conditions: Is location within a sensitive area (according to Rule 901e)? [X] Y [] N If yes, attach evaluation.
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Non-Crop Land
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Sandy Clay to Clay
Potential receptors (water wells within 1/4 mi, surface waters, etc.): There is no surface water within 1/4 mile of the site. The nearest water well is approximately 725' northwest of the release area.
Description of Impact (if previously provided, refer to that form or document):
Impacted Media (check): [X] Soils, [] Vegetation, [X] Groundwater, [] Surface water
Extent of Impact: 24' (E-W) x 26' (N-S) x 10' bgs
How Determined: Excavation, soil sampling, and laboratory analysis; Groundwater sampling and laboratory analysis

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
On February 12, 2016, historical hydrocarbon impacts were discovered along the produced water sump dumpline during construction activities at the HSR-Grant Brothers 10-31 production facility. The volume of released material is unknown. The facility was shut in, associated infrastructure repaired, and excavation activities commenced. Groundwater was encountered at approximately 10 feet below ground surface (bgs). An Initial Form 19 was submitted to the COGCC on February 15, 2016 (Document # 400988955) and a Supplemental Form 19 was submitted to the COGCC on February 22, 2016 (Document # 400993405). The COGCC has issued Spill Tracking #444846 for this release.
Describe how source is to be removed:
On February 12, 2016, excavation activities commenced and approximately 500 cubic yards of impacted material were excavated and transported to the Front Range Regional Landfill in Erie, Colorado for disposal. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls of the final extent of the excavation area at approximately 8 feet bgs. Soil samples were 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 USEPA Method 8260, TPH - diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), and pH. Laboratory results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below applicable COGCC Table 910-1 standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations. Groundwater was encountered in the excavation at approximately 10 feet bgs. Approximately 80 barrels of groundwater were removed from the excavation area via vacuum truck and transported to a licensed injection facility for disposal. A groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX. Analytical results received on February 18, 2016, indicated that the benzene concentration in sample GW01 was above the applicable COGCC Table 910-1 groundwater standard. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. Soil and excavation groundwater sample locations are illustrated on Figure 1 and laboratory analytical reports are included as Attachment A.
Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
Impacted soil was excavated and transported to the Front Range Regional Landfill in Erie, Colorado. Impacted groundwater was transported to a licensed injection facility for disposal. Prior to backfilling the excavation, approximately 110 pounds of activated carbon were introduced to the groundwater table to mitigate remaining aqueous phase hydrocarbon impacts. Additional groundwater monitoring measures are described on the following page.

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado (303) 894-2100 Fax 894-2109



Tracking Number: Name of Operator: OGCC Operator No: Received Date: Well Name & No: Facility Name & No.:

REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): Temporary groundwater monitoring wells will be installed at the site to further assess the extent of groundwater impacts. These wells will be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain below COGCC groundwater standards for four consecutive quarters.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required. The excavation has been backfilled with clean soil and graded to match the adjacent topography. Kerr-McGee's tank battery remains at the site. Reclamation activities at the site will be compliant with COGCC regulations.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing. Is further site investigation required? [X] Y [] N If yes, describe: Laboratory data indicate that impacted soils in the excavation have been remediated to below COGCC Table 910-1 standards. Temporary monitoring wells will be installed to further assess groundwater impacts. Groundwater samples will be collected from the temporary monitoring wells until BTEX concentrations remain below the applicable COGCC standards for four consecutive quarters. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Impacted soil was transported to the Front Range Regional Landfill in Erie, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

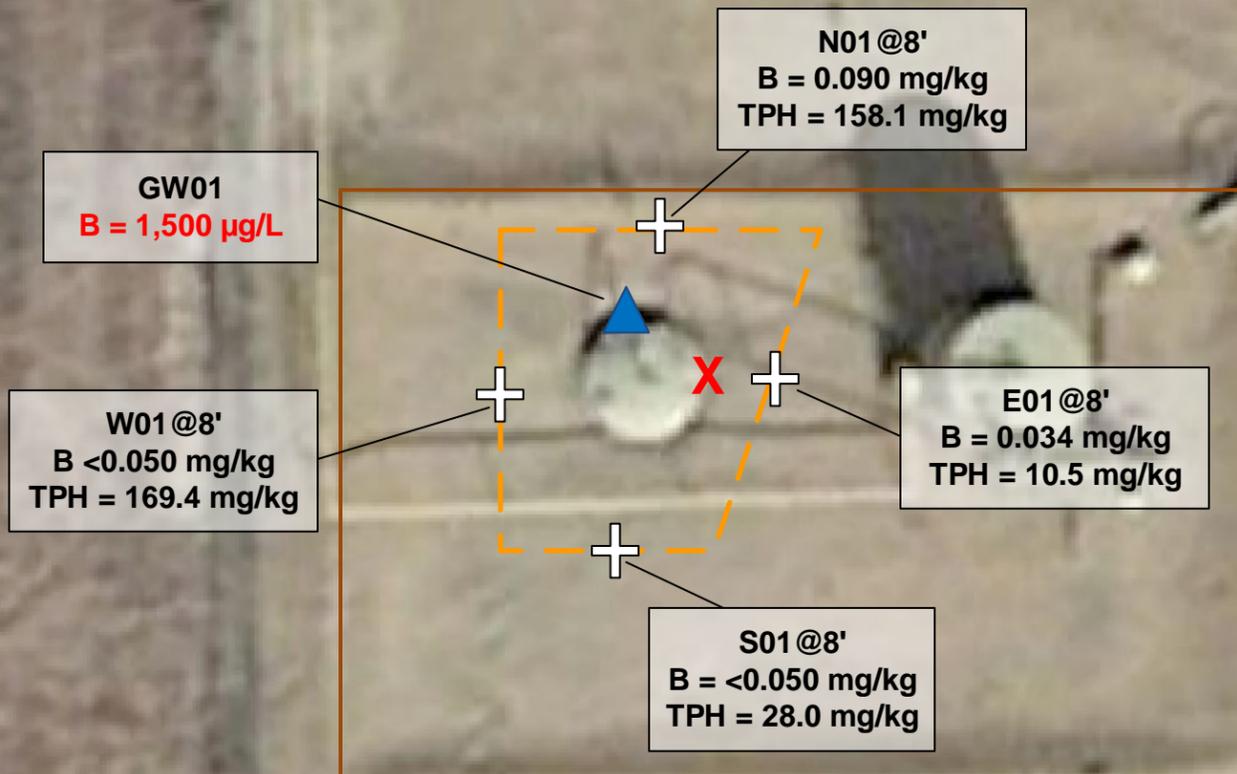
Table with 4 columns: Date Site Investigation Began, Date Site Investigation Completed, Remediation Plan Submitted, Remediation Start Date, Anticipated Completion Date, Actual Completion Date.

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete. Print Name: Phillip Hamlin

Signed: [Signature] Title: Senior HSE Representative Date: 4/8/2016

OGCC Approved: Title: Date:

FIGURE



Legend

- Excavation Extent
- Area of Release
- Earthen Berm
- Soil Sample Location
- Groundwater Sample Location

Notes

All Locations are Approximate Unless Otherwise Noted.

RED text indicates an exceedance of COGCC Table 910-1 standards

B – Benzene
 TPH – Total Petroleum Hydrocarbons
 mg/kg – Milligrams Per Kilogram
 µg/L – Micrograms Per Liter

0 ft. 15 ft. 30 ft.

Image Source: Google Earth 2015

DATE:	February 22, 2016
DESIGNED BY:	B. Nelson
DRAWN BY:	B. Nelson



Kerr-McGee Oil and Gas Onshore, LP
HSR-Grant Brothers 10-31
 NESE, Section 31, Township 2 North, Range 67 West
 Weld County, Colorado

Sample Location
Map

FIGURE
1

**ANALYTICAL
TABLES**

TABLE 1
HSR-GRANT BROTHERS 10-31
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)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500			4 mmhos/cm or 2x BG	6-9
W01@8'	02/16/16	8	<0.050	<0.050	0.450	<0.050	39.4	130	<200	0.155	8.60
N01@8'	02/16/16	8	0.090	<0.050	0.716	<0.050	73.1	85.0	<200	0.117	8.69
S01@8'	02/16/16	8	<0.050	<0.050	0.213	<0.050	28.0	<50	<200	0.150	8.61
E01@8'	02/16/16	8	0.034	<0.002	<0.002	<0.002	10.5	<50	<200	0.0905	8.37

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.

TABLE 2
HSR-GRANT BROTHERS 10-31
GROUNDWATER SAMPLE RESULTS SUMMARY TABLE
KERR-McGEE OIL AND GAS ONSHORE LP

Sample ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth To Water (ft. BGS)
COGCC Standards for groundwater (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	02/17/16	1,500	<4.0	438	676	~10

Notes:

1. Standards for groundwater 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.

µg/L = Micrograms per liter.

ft. BGS = Feet below ground surface

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

**ATTACHMENT A
LABORATORY
ANALYTICAL REPORTS**

February 17, 2016

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Grant Bros 10-31

Project Number - [none]

Attached are your analytical results for KMG - Grant Bros 10-31 received by Origins Laboratory, Inc. February 16, 2016. This project is associated with Origins project number X602171-01.

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



Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Grant Bros 10-31

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W01 @ 8'	X602171-01	Soil	February 16, 2016 14:50	02/16/2016 16:45
N01 @ 8'	X602171-02	Soil	February 16, 2016 14:57	02/16/2016 16:45
S01 @ 8'	X602171-03	Soil	February 16, 2016 15:03	02/16/2016 16:45
E01 @ 8'	X602171-04	Soil	February 16, 2016 15:06	02/16/2016 16:45

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X602171

Client: Tasman

Client Project ID: Grant Bros 10-31

Checklist Completed by: Jefe Smith

Shipped Via: Pick Up
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 2/16/12

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____

Cooler Number/Temperature: L / 3.9 °C / _____ °C / _____ °C / _____ °C (Describe)

Thermometer ID: 1253

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	X			PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (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 ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

⁽¹⁾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.

Jefe Smith
 Reviewed by (Project Manager)

2/16/12
 Date/Time Reviewed

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

W01 @ 8'
2/16/2016 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X602171-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	130	50	mg/kg	1	B6B1510	02/16/2016	02/16/2016	
Residual Range Organics (C28-C40)	ND	200	"	"	"	"	"	U

Surrogate: o-Terphenyl 73.2 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	39.4	5.00	mg/kg	25	B6B1509	02/16/2016	02/16/2016	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	0.450	0.050	"	"	"	"	"	
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 76.4 % 70-130 " " "
Surrogate: Toluene-d8 99.5 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 97.3 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.60		pH Units	1	B6B1507	02/16/2016	02/16/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.155		mmhos/cm	"	B6B1508	02/16/2016	02/16/2016	
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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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

N01 @ 8'
2/16/2016 2:57:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X602171-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	85	50	mg/kg	1	B6B1510	02/16/2016	02/16/2016	
Residual Range Organics (C28-C40)	ND	200	"	"	"	"	"	U

Surrogate: o-Terphenyl 78.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	73.1	5.00	mg/kg	25	B6B1509	02/16/2016	02/16/2016	
Benzene	0.090	0.050	"	"	"	"	"	
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	0.716	0.050	"	"	"	"	"	
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 82.4 % 70-130 " " "
Surrogate: Toluene-d8 99.2 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 95.8 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.69		pH Units	1	B6B1507	02/16/2016	02/16/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.117		mmhos/cm	"	B6B1508	02/16/2016	02/16/2016	
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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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

S01 @ 8'
2/16/2016 3:03:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X602171-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B6B1510	02/16/2016	02/16/2016	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 58.1 % 59-131 " " " S-04

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	28.0	5.00	mg/kg	25	B6B1509	02/16/2016	02/17/2016	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	0.213	0.050	"	"	"	"	"	
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 82.1 % 70-130 " " "

Surrogate: Toluene-d8 99.9 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 93.1 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.61		pH Units	1	B6B1507	02/16/2016	02/16/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.150		mmhos/cm	"	B6B1508	02/16/2016	02/16/2016	
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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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

E01 @ 8'
2/16/2016 3:06:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X602171-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B6B1510	02/16/2016	02/16/2016	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	"	"	U

Surrogate: o-Terphenyl 76.6 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	10.5	0.200	mg/kg	1	B6B1509	02/16/2016	02/17/2016	
Benzene	0.034	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	ND	0.002	"	"	"	"	"	U
Xylenes, total	ND	0.002	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 83.9 % 70-130 " " "
Surrogate: Toluene-d8 104 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 103 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.37		pH Units	1	B6B1507	02/16/2016	02/16/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0905		mmhos/cm	"	B6B1508	02/16/2016	02/16/2016	
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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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1509 - EPA 5030 (soil)

Blank (B6B1509-BLK1)

Prepared: 02/15/2016 Analyzed: 02/16/2016

Gasoline Range Hydrocarbons	ND	0.200	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	65.5		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	65.4		"	62.5		105	70-130			
Surrogate: 4-Bromofluorobenzene	58.7		"	62.5		93.9	70-130			

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1509 - EPA 5030 (soil)

LCS (B6B1509-BS1)

Prepared: 02/15/2016 Analyzed: 02/16/2016

Benzene	0.094	0.002	mg/kg	0.100		94.1	77.1-124			
Toluene	0.095	0.002	"	0.100		94.6	74.5-128			
Ethylbenzene	0.095	0.002	"	0.100		94.9	66.4-127			
m,p-Xylene	0.188	0.004	"	0.200		93.8	76.6-124			
o-Xylene	0.095	0.002	"	0.100		94.6	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	56.5		ug/kg	62.5		90.3	70-130			
Surrogate: Toluene-d8	61.1		"	62.5		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	64.9		"	62.5		104	70-130			

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1509 - EPA 5030 (soil)

Matrix Spike (B6B1509-MS1)	Source: X602155-01			Prepared: 02/15/2016 Analyzed: 02/16/2016						
Benzene	0.095	0.002	mg/kg	0.100	ND	95.4	71.8-126			
Toluene	0.101	0.002	"	0.100	ND	101	65.1-130			
Ethylbenzene	0.091	0.002	"	0.100	ND	91.3	62.2-130			
m,p-Xylene	0.181	0.004	"	0.200	ND	90.3	46.5-137			
o-Xylene	0.091	0.002	"	0.100	ND	91.4	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	56.2		ug/kg	62.5		89.9	70-130			
Surrogate: Toluene-d8	64.6		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	62.5		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1509 - EPA 5030 (soil)

Matrix Spike Dup (B6B1509-MSD1)	Source: X602155-01			Prepared: 02/15/2016 Analyzed: 02/16/2016						
Benzene	0.092	0.002	mg/kg	0.100	ND	92.5	71.8-126	3.07	11.3	
Toluene	0.090	0.002	"	0.100	ND	90.0	65.1-130	11.2	15.4	
Ethylbenzene	0.086	0.002	"	0.100	ND	86.3	62.2-130	5.65	19.6	
m,p-Xylene	0.177	0.004	"	0.200	ND	88.3	46.5-137	2.27	19.2	
o-Xylene	0.085	0.002	"	0.100	ND	85.3	54.2-134	6.88	17.9	
Surrogate: 1,2-Dichloroethane-d4	55.8		ug/kg	62.5		89.2	70-130			
Surrogate: Toluene-d8	62.6		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	62.8		"	62.5		100	70-130			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1510 - EPA 3580

Blank (B6B1510-BLK1)

Prepared: 02/15/2016 Analyzed: 02/16/2016

Diesel (C10-C28)	ND	50	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	49		"	50.0		97.4	59-131			

LCS (B6B1510-BS1)

Prepared: 02/15/2016 Analyzed: 02/16/2016

Diesel (C10-C28)	1100	50	mg/kg	1000		113	64-121			
Residual Range Organics (C28-C40)	1100	200	"	1000		110	58-124			
Surrogate: o-Terphenyl	50		"	50.0		101	59-131			

Matrix Spike (B6B1510-MS1)

Source: X602145-06

Prepared: 02/15/2016 Analyzed: 02/16/2016

Diesel (C10-C28)	880	50	mg/kg	1000	ND	87.9	53-125			
Residual Range Organics (C28-C40)	860	200	"	1000	12	84.4	47-133			
Surrogate: o-Terphenyl	41		"	50.0		82.1	59-131			

Matrix Spike Dup (B6B1510-MSD1)

Source: X602145-06

Prepared: 02/15/2016 Analyzed: 02/16/2016

Diesel (C10-C28)	920	50	mg/kg	1000	ND	91.8	53-125	4.35	20	
Residual Range Organics (C28-C40)	880	200	"	1000	12	86.7	47-133	2.64	20	
Surrogate: o-Terphenyl	45		"	50.0		89.7	59-131			

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 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B6B1507 - NO PREP										
Duplicate (B6B1507-DUP1)		Source: X602145-05			Prepared: 02/15/2016 Analyzed: 02/16/2016					
pH	8.21		pH Units		8.26			0.607	25	
Batch B6B1508 - NO PREP										
Blank (B6B1508-BLK1)		Prepared: 02/15/2016 Analyzed: 02/16/2016								
Specific Conductance (EC)	0.00340		mmhos/cm							
Duplicate (B6B1508-DUP1)		Source: X602145-05			Prepared: 02/15/2016 Analyzed: 02/16/2016					
Specific Conductance (EC)	0.0471		mmhos/cm		0.0439			7.03	25	

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6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Grant Bros 10-31

Notes and Definitions

U Sample is Non-Detect.

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

February 18, 2016

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Grant Bros 10-31

Project Number - [none]

Attached are your analytical results for KMG - Grant Bros 10-31 received by Origins Laboratory, Inc. February 17, 2016. This project is associated with Origins project number X602191-01.

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



Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Grant Bros 10-31

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01	X602191-01	Water	February 17, 2016 14:45	02/17/2016 17:00

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31



X602191

www.originslaboratory.com

page of

Client: Tasman Geo

Address:

Telephone Number: 912 734 2407

Email Address: v.cornez@tasman-geo.com

Project Manager: Bob Cornez

Project Name: Grant Brothers 10-31

Project Number:

Samples Collected By: Druck Nelson

AKC Invoice Sam LaRue

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Sample Container #	Other		
GWC1	2/17/16	1445	5		X			X				BTEX (P26)	1
													2
													3
													4
													5
													6
													7
													8
													9
													10

Relinquished By: 

Relinquished By:

Date: 2/11/16

Date:

Time: 1700

Time:

Received By: 

Received By:

Date: 2.17.16

Date:

Time: 1700

Time:

Turnaround Time:

Same Day 24 Hr

48 Hr 72 Hr

Standard

8-1

Date Results Needed

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.

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X60291

Client: Tasman

Client Project ID: Grant Brothers 10-31

Checklist Completed by: JFF Smith

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

Date/time completed: 2/17/12

Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____

Cooler Number/Temperature: 1 / 8.1 °C / _____ °C / _____ °C (Describe) _____ °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 ⁽¹⁾ ?		X		Simple Same Day
Is there ice present (document if blue ice is used)	✓			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		✓		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		✓		
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)	✓			HCL
Additional Comments (if any):				

⁽¹⁾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.

JFF Smith
 Reviewed by (Project Manager)

2/17/12
 Date/Time Reviewed

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

GW01
2/17/2016 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X602191-01 (Water)

BTEX by EPA 8260C

Benzene	1500	50.0	ug/L	50	B6B1513	02/17/2016	02/17/2016	
Toluene	ND	4.0	"	4	"	"	02/17/2016	U
Ethylbenzene	438	4.0	"	"	"	"	"	
Xylenes, total	676	4.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.5 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.5 %	84-114			"	"	"	

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Blank (B6B1513-BLK1)

Prepared: 02/15/2016 Analyzed: 02/17/2016

Benzene	ND	1.0	ug/L							U
Toluene	ND	1.0	"							U
Ethylbenzene	ND	1.0	"							U
Xylenes, total	ND	1.0	"							U
Surrogate: 1,2-Dichloroethane-d4	71		"	62.5	113		84-121			
Surrogate: Toluene-d8	61		"	62.5	96.8		85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104		84-114			

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Blank (B6B1513-BLK2)

Prepared: 02/15/2016 Analyzed: 02/17/2016

Benzene	ND	1.0	ug/L							U
Toluene	ND	1.0	"							U
Ethylbenzene	ND	1.0	"							U
Xylenes, total	ND	1.0	"							U
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.7	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.9	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

LCS (B6B1513-BS1)

Prepared: 02/15/2016 Analyzed: 02/17/2016

Benzene	48.7	1.0	ug/L	50.0		97.5	73.3-129			
Toluene	45.9	1.0	"	50.0		91.8	76.2-123			
Ethylbenzene	46.3	1.0	"	50.0		92.6	73.6-130			
m,p-Xylene	92.3	2.0	"	100		92.3	76.1-126			
o-Xylene	45.5	1.0	"	50.0		91.0	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		107	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.1	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

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 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

LCS (B6B1513-BS2)

Prepared: 02/15/2016 Analyzed: 02/17/2016

Benzene	50.0	1.0	ug/L	50.0		100	73.3-129			
Toluene	50.6	1.0	"	50.0		101	76.2-123			
Ethylbenzene	50.2	1.0	"	50.0		100	73.6-130			
m,p-Xylene	102	2.0	"	100		102	76.1-126			
o-Xylene	49.8	1.0	"	50.0		99.7	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		104	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.8	84-114			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Matrix Spike (B6B1513-MS1)	Source: X602127-01			Prepared: 02/15/2016 Analyzed: 02/17/2016						
Benzene	48.3	1.0	ug/L	50.0	ND	96.7	74-130			
Toluene	45.9	1.0	"	50.0	ND	91.7	73-131			
Ethylbenzene	46.2	1.0	"	50.0	ND	92.4	76-132			
m,p-Xylene	92.5	2.0	"	100	ND	92.5	69-139			
o-Xylene	47.4	1.0	"	50.0	ND	94.8	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.5	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		105	84-114			

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 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Matrix Spike (B6B1513-MS2)	Source: X602127-02			Prepared: 02/15/2016 Analyzed: 02/17/2016						
Benzene	42.1	1.0	ug/L	50.0	ND	84.2	74-130			
Toluene	39.9	1.0	"	50.0	ND	79.9	73-131			
Ethylbenzene	40.0	1.0	"	50.0	ND	80.0	76-132			
m,p-Xylene	80.4	2.0	"	100	ND	80.4	69-139			
o-Xylene	41.2	1.0	"	50.0	ND	82.3	74-131			
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		108	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.0	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Matrix Spike Dup (B6B1513-MSD1)	Source: X602127-01			Prepared: 02/15/2016 Analyzed: 02/17/2016						
Benzene	44.3	1.0	ug/L	50.0	ND	88.5	74-130	8.79	20	
Toluene	41.5	1.0	"	50.0	ND	83.0	73-131	10.0	20	
Ethylbenzene	41.5	1.0	"	50.0	ND	83.0	76-132	10.7	20	
m,p-Xylene	83.3	2.0	"	100	ND	83.3	69-139	10.4	20	
o-Xylene	42.5	1.0	"	50.0	ND	85.0	74-131	11.0	20	
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		108	84-121			
Surrogate: Toluene-d8	61		"	62.5		96.8	85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	84-114			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Grant Bros 10-31

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 B6B1513 - EPA 5030B (Water)

Matrix Spike Dup (B6B1513-MSD2)	Source: X602127-02			Prepared: 02/15/2016 Analyzed: 02/17/2016						
Benzene	49.8	1.0	ug/L	50.0	ND	99.5	74-130	16.7	20	
Toluene	46.4	1.0	"	50.0	ND	92.9	73-131	15.0	20	
Ethylbenzene	46.8	1.0	"	50.0	ND	93.7	76-132	15.7	20	
m,p-Xylene	93.6	2.0	"	100	ND	93.6	69-139	15.3	20	
o-Xylene	47.2	1.0	"	50.0	ND	94.4	74-131	13.6	20	
Surrogate: 1,2-Dichloroethane-d4	68		"	62.5		109	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.5	85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		103	84-114			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Grant Bros 10-31

Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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.

Jen Pellegrini For Noelle Doyle Mathis, President