

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

Received 5/29/2015  
Document 2143459  
REM 9109

**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.

Complaint OGCC Employee: \_\_\_\_\_  
NOAV \_\_\_\_\_  
 Spill \_\_\_\_\_  
 Inspection \_\_\_\_\_  
Tracking No: ~~439679~~ 400720388

**CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED**

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

**GENERAL INFORMATION**

<b>OGCC Operator Number:</b> 47120 Name of Operator: <u>Kerr-McGee Oil and Gas Onshore, LP</u> Address: <u>1099 18th Street, Suite 1800</u> City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>		Contact Name and Telephone <b>Name:</b> <u>Phillip Hamlin</u> No: <u>970-336-3500</u> Fax: <u>970-336-3656</u>	
<b>API/Facility No:</b> <u>05-123-16665</u> <b>Facility Name:</b> <u>Coughlin Red VV 22-1, 22-2</u> <b>Well Name:</b> <u>Coughlin Red</u> Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>NENE S22 T1N, R67W</u>		County: <u>Weld</u> Facility Number: <u>328953</u> Well Number: <u>VV 22-1</u> Latitude: <u>40.040111</u> Longitude: <u>-104.872880</u>	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate and Produced Water  
 Site Conditions: Is location within a sensitive area (according to Rule 901e)?  Y  N If yes, attach evaluation.  
 Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Agriculture  
 Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Silty clay to silty sand  
 Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located approximately 1,885 feet and an occupied building is located 800 feet from the site. The nearest water well is located approximately 850 feet from the release area.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>28' N-S x 31' E-W x 10' bgs</u>	<u>Excavation, soil sampling, and laboratory analysis</u>
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>See attached data</u>	<u>Groundwater sampling and laboratory analysis</u>
<input type="checkbox"/> Surface water	_____	_____

**REMEDIATION WORKPLAN**

Describe initial action taken (if previously provided, refer to that form or document):  
 On October 27, 2014, historical hydrocarbon impacts were encountered beneath a partially buried produced water vessel during tank battery decommissioning activities. The volume of the release is unknown. The wells were shut in and locked out, and petroleum hydrocarbon impacted soil was excavated and transported off-site for disposal. Groundwater was encountered in the excavation at approximately 10 feet below ground surface (bgs). Impacted groundwater was removed by a vacuum truck and taken to a licensed injection facility for disposal. An Initial Form 19 was submitted on October 30, 2014, and a Supplemental Form 19 was submitted on November 6, 2014. The COGCC has issued Spill Tracking number 439679 for this release.

Describe how source is to be removed:  
 Excavation activities commenced on October 27, 2014, and approximately 200 cubic yards (cy) of impacted soil were removed and transported to the Front Range Landfill in Erie, Colorado. 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 final extent of the excavation and 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 8260B, TPH - diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015. Laboratory results for the confirmation soil samples indicated that BTEX and TPH concentrations were below applicable COGCC standards at the final extent of the excavation. Groundwater was encountered in the excavation at approximately 10 feet bgs and a vacuum truck was used to remove approximately 80 barrels of impacted groundwater from the excavation, which were transported to a licensed injection facility for disposal. Subsequently, a groundwater sample (GW01) was collected from the excavation for laboratory analysis of BTEX. Sample GW01 exhibited concentrations of benzene (2,620 ug/L) exceeding the applicable COGCC groundwater standard. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. Soil and excavation groundwater sample locations are illustrated on Figure 1, and laboratory analytical reports are included as attachments.

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.:  
 The impacted soil was excavated and transported to the Front Range Landfill in Erie, Colorado. The impacted groundwater was removed by a vacuum truck and transported to a licensed injection facility for disposal. 264 pounds of activated carbon were added to the groundwater in the excavation prior to backfilling. Additional proposed groundwater remediation 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: 439679 400720388
Name of Operator: Kerr-McGee Oil and Gas Onshore, LP
OGCC Operator No: 47120
Received Date: 5/29/2015
Well Name & No: Coughlin Red VV 22-1, 22-2
Facility Name & No.: Coughlin Red VV 22-1, 22-2 / 328953

REMEDIATION WORKPLAN (CONT.)

OGCC Employee: R. Allison

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
On April 1, 2015, five temporary groundwater monitoring wells (BH01 - BH05) were installed surrounding the area of release to assess groundwater impacts subsequent to the completion of excavation, groundwater removal, and activated carbon treatment activities.

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.
Following assessment and source removal activities, the site was restored to its pre-release grade. Kerr-McGee's tank battery has been decommissioned.

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? [ ] Y [X] N If yes, describe:
BTEX and TPH concentrations were below the applicable Table 910-1 standards for soil samples collected from the final extent of the excavation. Quarterly groundwater monitoring for BTEX will continue at the five temporary well locations until BTEX concentrations remain below COGCC groundwater standards for four consecutive quarters.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):
Impacted soil was transported to the Front Range 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: 5/29/15

OGCC Approved: \_\_\_\_\_ Title: Northeast EPS Date: 6/2/2015

## **TABLES**

TABLE 1  
 COUGHLIN RED VV 22-1, 22-2  
 SOIL SAMPLE RESULTS SUMMARY TABLE  
 KERR-McGEE OIL AND GAS ONSHORE LP

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH - GRO (mg/kg)	TEPH - DRO + ORO (mg/kg)
COGCC standards for soil (mg/kg) <sup>(1)</sup>								
NW01@8	10/24/2014	8	0.17	85	100	175	500	
			<0.0020	<0.0020	<0.0020	<0.0020	0.238	<200
NE01@8	10/24/2014	8	<0.0020	<0.0020	<0.0020	<0.0020	<0.200	<200
SW01@8	10/24/2014	8	<b>0.381</b>	<0.0020	0.0131	<0.0020	67.3	<200
SE01@8	10/24/2014	8	0.0229	<0.0020	<0.0020	<0.0020	0.546	<200
E01@8	10/24/2014	8	<0.0020	<0.0020	<0.0020	<0.0020	<0.200	<200
W01@8	10/24/2014	8	<0.0020	<0.0020	<0.0020	<0.0020	0.591	<200
SW02@8	10/27/2014	8	<0.0500	<0.0500	<0.0500	<0.0500	<5.00	<200

**Notes:**

- Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.  
 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  
 mg/kg = Milligrams per kilogram.  
 bgs = Below ground surface.  
**BOLD** = Analytical result is in exceedance of COGCC Table 910-1 soil standards.

TABLE 2  
 COUGHLIN RED W 22-1, 22-2  
 GROUNDWATER SAMPLE RESULTS SUMMARY TABLE  
 KERR-McGEE OIL AND GAS ONSHORE LP

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
COGCC Table 910-1 Groundwater Standard (ug/L) <sup>(1)</sup>		5	560	700	1,400
GW01	10/24/2014	2,620	1.5	170	704
BH01	4/14/2015	<1.0	<1.0	<1.0	<1.0
BH02	4/14/2015	<1.0	<1.0	<1.0	<1.0
BH03	4/14/2015	<b>8.5</b>	<1.0	4.7	<1.0
BH04	4/14/2015	<1.0	<1.0	<1.0	<1.0
BH05	4/14/2015	1.0	<1.0	6.9	15.7

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

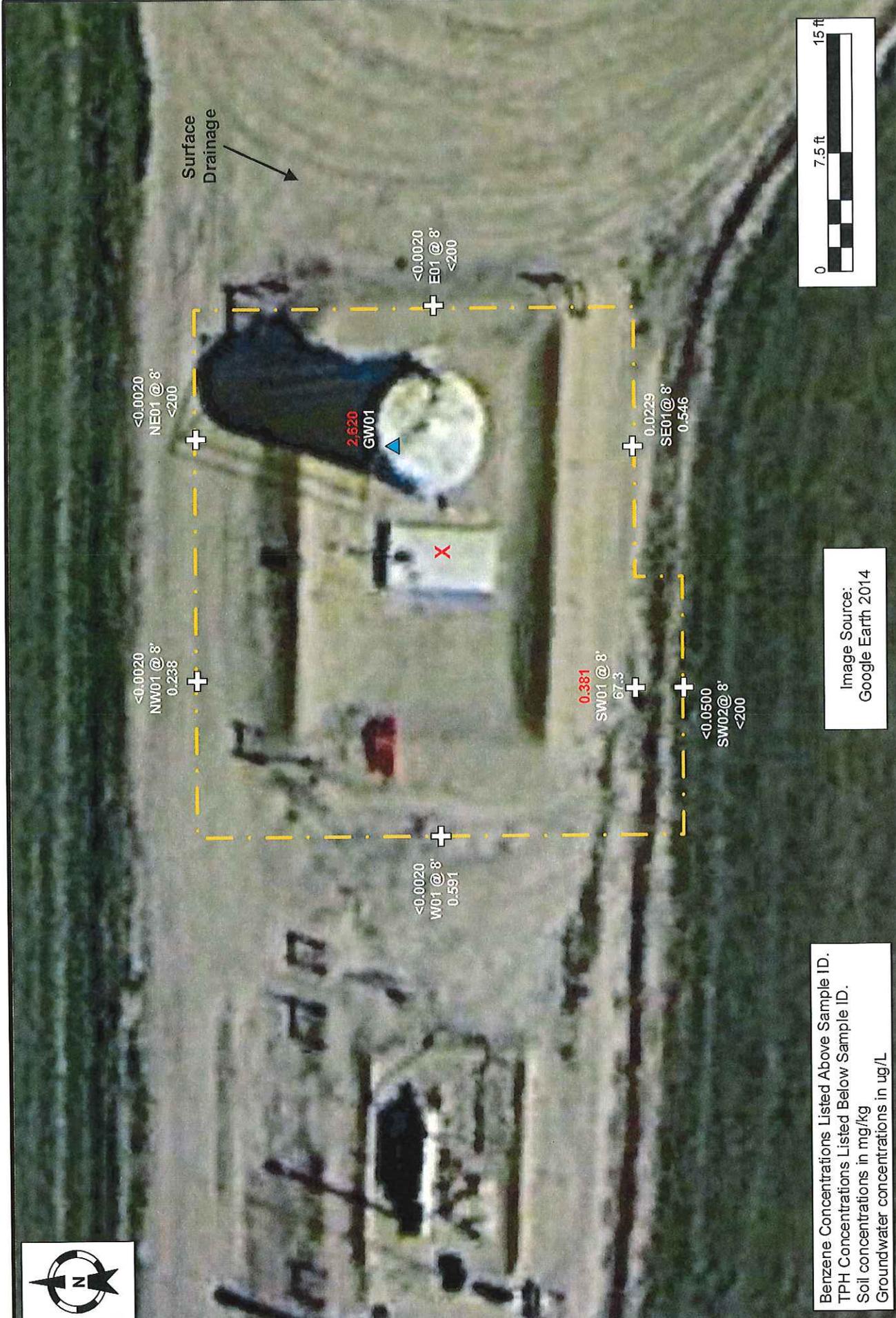
COGCC = Colorado Oil and Gas Conservation Commission

ug/L = Micrograms per liter

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

**BOLD** = Analytical result is in exceedance of COGCC groundwater standards.

## **FIGURES**



Benzene Concentrations Listed Above Sample ID.  
 TPH Concentrations Listed Below Sample ID.  
 Soil concentrations in mg/kg  
 Groundwater concentrations in ug/L

Image Source:  
 Google Earth 2014

**LEGEND**  
 - Yellow dashed line: Approximate Excavation Extent  
 - Red X: Approximate Release Location  
 - Cross (+): Approximate Soil Sample Location  
 - Blue triangle: Approximate Groundwater Sample Location

**TASMAN** 6899 Pecos St., Unit C  
 GEOSCIENCES Denver, CO 80221

**Facility Diagram**  
 Kerr-McGee Oil and Gas Onshore, LP  
 Coughlin Red W 22-1, 22-2  
 NENE S22 T1N R67W  
 Weld County, CO

DRAWN BY: ESS  
 DATE: 4/28/2015

**FIGURE 1**  
 SITE MAP AND SAMPLE LOCATIONS



BH01	
Compound (ug/L)	4/14/2015
Benzene	<1.0
Toluene	<1.0
Ethy/benzene	<1.0
Total Xylenes	<1.0

BH01

BH02	
Compound (ug/L)	4/14/2015
Benzene	<1.0
Toluene	<1.0
Ethy/benzene	<1.0
Total Xylenes	<1.0

BH02

BH03	
Compound (ug/L)	4/14/2015
Benzene	8.5
Toluene	<1.0
Ethy/benzene	4.7
Total Xylenes	<1.0

BH03

GW01

BH04

BH04	
Compound (ug/L)	4/14/2015
Benzene	<1.0
Toluene	<1.0
Ethy/benzene	<1.0
Total Xylenes	<1.0

BH05

BH05	
Compound (ug/L)	4/14/2015
Benzene	<1.0
Toluene	<1.0
Ethy/benzene	6.9
Total Xylenes	15.7



Image Source:  
Google Earth 2014

- LEGEND
- Approximate Excavation Extent
  - Approximate Release Location
  - Approximate Monitoring Well Location
  - Approximate Groundwater Sample Location



6899 Pecos St., Unit C  
Denver, CO 80221

**Facility Diagram**  
Kerr-McGee Oil and Gas Onshore, LP  
Coughlin Red W 22-1, 22-2  
NENE S22 T1N R67W  
Weld County, CO

DRAWN BY: BRN

DATE: 4/28/2015

FIGURE 2  
TEMPORARY WELL  
LOCATIONS AND  
GROUNDWATER  
ANALYTICAL RESULTS



Image Source:  
Google Earth 2014



DRAWN BY: ESS DATE: 4/21/2015	<b>Facility Diagram</b> Kerr-McGee Oil and Gas Onshore, LP Coughlin Red W 22-1, 22-2 NENE S22 T1N R67W Weld County, CO	TASMAN GEOSCIENCES 6899 Pecos St., Unit C Denver, CO 80221	<b>FIGURE 3</b> <b>GROUNDWATER</b> <b>ELEVATION CONTOUR</b> <b>ELEVATION CONTOUR</b> <b>MAP</b> <b>(APRIL 14, 2015)</b>
	<b>LEGEND</b> Approximate Excavation Extent: Yellow dashed line Approximate Release Location: Red X Approximate Monitoring Well Location: Blue diamond with arrow Groundwater/Elevation Contour: Blue line Relative Groundwater Elevation: 94.10 Approximate Groundwater Flow Direction: Blue arrow		

**ATTACHMENT A**  
**LABORATORY ANALYTICAL REPORTS**



October 27, 2014

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - Coughlin Red VV 22-1

Project Number - [none]

Attached are your analytical results for Coughlin Red VV 22-1 received by Origins Laboratory, Inc. October 24, 2014. This project is associated with Origins project number X410280-01.

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

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Coughlin Red VV 22-1

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NW01 @ 8	X410280-01	Soil	October 24, 2014 13:47	10/24/2014 15:00
NE01 @ 8	X410280-02	Soil	October 24, 2014 13:50	10/24/2014 15:00
SW01 @ 8	X410280-03	Soil	October 24, 2014 13:53	10/24/2014 15:00
SE01 @ 8	X410280-04	Soil	October 24, 2014 13:55	10/24/2014 15:00
E01 @ 8	X410280-05	Soil	October 24, 2014 13:57	10/24/2014 15:00
W01 @ 8	X410280-06	Soil	October 24, 2014 14:00	10/24/2014 15:00
GW01	X410280-07	Water	October 24, 2014 14:10	10/24/2014 15:00

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.*

Jen Pellegrini For Noelle Doyle Mathis, President



Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X410280 Client: Tasman  
 Client Project ID: Coughlin Red VV22-1  
 Checklist Completed by: Jen Pellegrini Shipped Via: Pickup  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Date/time completed: 10-24-14 Airbill #: N/A  
 Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
 (Describe)  
 Cooler Number/Temperature: 1 / 8.9 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C / \_\_\_\_\_ °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> ?		X		sampled same day
Is there ice present (document if blue ice is used)	Y			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		Y		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		Y		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		Y		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	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 <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)	X			HCL
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 (Project Manager) \_\_\_\_\_ Date/Time Reviewed \_\_\_\_\_

Origins Laboratory, Inc.



Jen Pellegrini For Noelle Doyle Mathis, President

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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

NW01 @ 8  
 10/24/2014 1:47:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-01 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/26/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

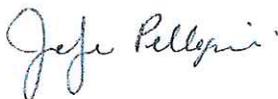
Surrogate: o-Terphenyl 92.5 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	0.238	0.200	mg/kg	1	4J24014	10/24/2014	10/24/2014	
Benzene	ND	0.0020	"	"	"	"	"	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	ND	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 93.7 % 70-130 " " "  
 Surrogate: Toluene-d8 99.7 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 102 % 70-130 " " "

Origins Laboratory, Inc.



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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**NE01 @ 8**  
**10/24/2014 1:50:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-02 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/26/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 89.4 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	4J24014	10/24/2014	10/24/2014	
Benzene	ND	0.0020	"	"	"	"	"	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	ND	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 90.0 % 70-130 " " "  
 Surrogate: Toluene-d8 98.6 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 98.9 % 70-130 " " "

Origins Laboratory, Inc.



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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**SW01 @ 8**  
**10/24/2014 1:53:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-03 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/27/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 89.6 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	67.3	5.00	mg/kg	25	4J24014	10/24/2014	10/27/2014	
Benzene	0.381	0.0020	"	1	"	"	10/24/2014	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	0.0131	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 79.8 % 70-130 " " "  
 Surrogate: Toluene-d8 119 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 107 % 70-130 " " "

Origins Laboratory, Inc.



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 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**SE01 @ 8**  
**10/24/2014 1:55:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-04 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/27/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 86.4 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	0.546	0.200	mg/kg	1	4J24014	10/24/2014	10/25/2014	
Benzene	0.0229	0.0020	"	"	"	"	"	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	ND	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 77.7 % 70-130 " " "  
 Surrogate: Toluene-d8 98.8 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 96.4 % 70-130 " " "

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**E01 @ 8**  
**10/24/2014 1:57:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-05 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/27/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 90.1 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	4J24014	10/24/2014	10/25/2014	
Benzene	ND	0.0020	"	"	"	"	"	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	ND	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 86.6 % 70-130 " " "  
 Surrogate: Toluene-d8 100 % 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 98.9 % 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

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

W01 @ 8  
 10/24/2014 2:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-06 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J24013	10/24/2014	10/27/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 78.4% 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	0.591	0.200	mg/kg	1	4J24014	10/24/2014	10/25/2014	
Benzene	ND	0.0020	"	"	"	"	"	
Toluene	ND	0.0020	"	"	"	"	"	
Ethylbenzene	ND	0.0020	"	"	"	"	"	
Xylenes, total	ND	0.0020	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 80.2% 70-130 " " "  
 Surrogate: Toluene-d8 102% 70-130 " " "  
 Surrogate: 4-Bromofluorobenzene 97.2% 70-130 " " "

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**GW01**  
**10/24/2014 2:10:00PM**

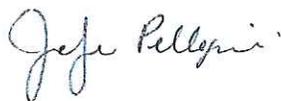
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410280-07 (Water)**

**BTEX by EPA 8260C**

Benzene	2620	50.0	ug/L	50	4J24012	10/24/2014	10/26/2014	
Toluene	1.5	1.0	"	1	"	"	10/24/2014	
Ethylbenzene	170	1.0	"	"	"	"	"	
Xylenes, total	704	50.0	"	50	"	"	10/26/2014	
Surrogate: 1,2-Dichloroethane-d4	92.3 %	87.3-113			"	"	10/24/2014	
Surrogate: Toluene-d8	99.4 %	90.9-108			"	"	10/26/2014	
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	10/24/2014	

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24012 - EPA 5030B (Water)

Blank (4J24012-BLK1)

Prepared: 10/24/2014 Analyzed: 10/24/2014

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5	86.2	87.3-113				S-GC
Surrogate: Toluene-d8	66		"	62.5	105	90.9-108				
Surrogate: 4-Bromofluorobenzene	63		"	62.5	100	88.6-111				

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24012 - EPA 5030B (Water)

LCS (4J24012-BS1)				Prepared: 10/24/2014 Analyzed: 10/24/2014						
Benzene	55.2	1.0	ug/L	50.0	110	75-126				
Toluene	55.2	1.0	"	50.0	110	78.7-126				
Ethylbenzene	55.4	1.0	"	50.0	111	81-130				
m,p-Xylene	111	2.0	"	100	111	77.2-133				
o-Xylene	55.6	1.0	"	50.0	111	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	97.0	87.3-113				
Surrogate: Toluene-d8	62		"	62.5	99.8	90.9-108				
Surrogate: 4-Bromofluorobenzene	61		"	62.5	97.7	88.6-111				

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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24012 - EPA 5030B (Water)

Matrix Spike (4J24012-MS1)	Source: X410250-01			Prepared: 10/24/2014 Analyzed: 10/24/2014						
Benzene	57.5	1.0	ug/L	50.0	ND	115	74-130			
Toluene	59.0	1.0	"	50.0	ND	118	73-131			
Ethylbenzene	60.2	1.0	"	50.0	ND	120	76-132			
m,p-Xylene	119	2.0	"	100	ND	119	69-139			
o-Xylene	57.7	1.0	"	50.0	ND	115	74-131			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.5	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	88.6-111			

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24012 - EPA 5030B (Water)

Matrix Spike Dup (4J24012-MSD1)	Source: X410250-01			Prepared: 10/24/2014 Analyzed: 10/24/2014						
Benzene	53.9	1.0	ug/L	50.0	ND	108	74-130	6.51	20	
Toluene	54.7	1.0	"	50.0	ND	109	73-131	7.44	20	
Ethylbenzene	56.1	1.0	"	50.0	ND	112	76-132	7.19	20	
m,p-Xylene	112	2.0	"	100	ND	112	69-139	6.23	20	
o-Xylene	54.2	1.0	"	50.0	ND	108	74-131	6.27	20	
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.3	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	88.6-111			

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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24014 - EPA 5030 (soil)

Blank (4J24014-BLK1)

Prepared: 10/24/2014 Analyzed: 10/24/2014

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0020	"							
Ethylbenzene	ND	0.0020	"							
Xylenes, total	ND	0.0020	"							
Surrogate: 1,2-Dichloroethane-d4	56.3		ug/kg	62.5	90.1		70-130			
Surrogate: Toluene-d8	61.2		"	62.5	97.9		70-130			
Surrogate: 4-Bromofluorobenzene	60.9		"	62.5	97.4		70-130			

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24014 - EPA 5030 (soil)</b>										
<b>LCS (4J24014-BS1)</b>					Prepared: 10/24/2014 Analyzed: 10/24/2014					
Benzene	0.103	0.0020	mg/kg	0.100	103	77.1-124				
Toluene	0.0997	0.0020	"	0.100	99.7	74.5-128				
Ethylbenzene	0.105	0.0020	"	0.100	105	66.4-127				
m,p-Xylene	0.210	0.0040	"	0.200	105	76.6-124				
o-Xylene	0.105	0.0020	"	0.100	105	76.6-124				
Surrogate: 1,2-Dichloroethane-d4	56.7		ug/kg	62.5	90.7	70-130				
Surrogate: Toluene-d8	62.5		"	62.5	99.9	70-130				
Surrogate: 4-Bromofluorobenzene	63.4		"	62.5	101	70-130				

Origins Laboratory, Inc.



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 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

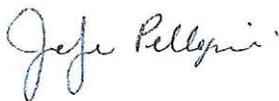
**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4J24014 - EPA 5030 (soil)

Matrix Spike (4J24014-MS1)	Source: X410270-01			Prepared: 10/24/2014 Analyzed: 10/24/2014						
Benzene	0.105	0.0020	mg/kg	0.100	ND	105	71.8-126			
Toluene	0.101	0.0020	"	0.100	ND	101	65.1-130			
Ethylbenzene	0.105	0.0020	"	0.100	ND	105	62.2-130			
m,p-Xylene	0.208	0.0040	"	0.200	ND	104	46.5-137			
o-Xylene	0.102	0.0020	"	0.100	ND	102	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	54.2		ug/kg	62.5		86.7	70-130			
Surrogate: Toluene-d8	61.3		"	62.5		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.3	70-130			

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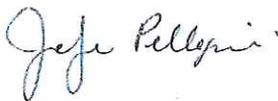
Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24014 - EPA 5030 (soil)</b>										
<b>Matrix Spike Dup (4J24014-MSD1)</b>			<b>Source: X410270-01</b>			Prepared: 10/24/2014 Analyzed: 10/24/2014				
Benzene	0.105	0.0020	mg/kg	0.100	ND	105	71.8-126	0.590	11.3	
Toluene	0.100	0.0020	"	0.100	ND	100	65.1-130	0.458	15.4	
Ethylbenzene	0.110	0.0020	"	0.100	ND	110	62.2-130	4.20	19.6	
m,p-Xylene	0.217	0.0040	"	0.200	ND	108	46.5-137	4.23	19.2	
o-Xylene	0.106	0.0020	"	0.100	ND	106	54.2-134	3.88	17.9	
Surrogate: 1,2-Dichloroethane-d4	53.4		ug/kg	62.5		85.5	70-130			
Surrogate: Toluene-d8	60.5		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	65.0		"	62.5		104	70-130			

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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 8015M - 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 4J24013 - EPA 3580**

<b>Blank (4J24013-BLK1)</b>				Prepared: 10/24/2014 Analyzed: 10/26/2014						
Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	46		g	50.0		92.3	59-131			
<b>LCS (4J24013-BS1)</b>				Prepared: 10/24/2014 Analyzed: 10/27/2014						
Diesel (C10-C28)	860	50	mg/kg	1000		85.6	64-121			
Residual Range Organics (C28-C36)	880	200	"	1000		87.8	58-124			
Surrogate: o-Terphenyl	47		g	50.0		94.5	59-131			
<b>Matrix Spike (4J24013-MS1)</b>		<b>Source: X410270-01</b>			Prepared: 10/24/2014 Analyzed: 10/26/2014				<b>QM-07</b>	
Diesel (C10-C28)	180	50	mg/kg	1000	14	16.3	53-125			
Residual Range Organics (C28-C36)	28	200	"	1000	26	0.213	47-133			
Surrogate: o-Terphenyl	49		g	50.0		97.5	59-131			
<b>Matrix Spike Dup (4J24013-MSD1)</b>		<b>Source: X410270-01</b>			Prepared: 10/24/2014 Analyzed: 10/26/2014				<b>QM-07</b>	
Diesel (C10-C28)	170	50	mg/kg	1000	14	16.1	53-125	1.50	20	
Residual Range Organics (C28-C36)	27	200	"	1000	26	0.130	47-133	2.98	20	
Surrogate: o-Terphenyl	47		g	50.0		94.2	59-131			

Origins Laboratory, Inc.



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6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Coughlin Red VV 22-1

---

**Notes and Definitions**

- S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- 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



October 28, 2014

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - Coughlin Red VV 22-1

Project Number - [none]

Attached are your analytical results for Coughlin Red VV 22-1 received by Origins Laboratory, Inc. October 27, 2014. This project is associated with Origins project number X410295-01.

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

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Coughlin Red VV 22-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW02 @ 8	X410295-01	Soil	October 27, 2014 12:32	10/27/2014 15:19

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

# ORIGINS

LABORATORY, INC

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

www.originslaboratory.com

page 1 of 1

# ORIGINS

LABORATORY, INC

X110295

Client: Tasman Geol Project Manager/Send Report To: Christine Wasko  
 Address: \_\_\_\_\_ Email Address: Christine.Wasko@originslab.com  
 Telephone Number: 912 270 2887 Project Name/Number: Coughlin Red VV 22-1  
 Samples Collected By: Bank Nelson

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

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis/Method	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	As Sample #		
SUC-08	10/21/14	12:30	1					Y				1 DTE-1650 (5200)
												2 TTH DEPT (08) (815)
												3
												4
												5
												6
												7
												8
												9
												10
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____	Turnaround Time: _____	Same Day <input type="checkbox"/>	24 Hr <input type="checkbox"/>	48 Hr <input type="checkbox"/>	72 Hr <input type="checkbox"/>	Standard <input type="checkbox"/>	\$1
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____							

Comments: \_\_\_\_\_ Date Results Needed: \_\_\_\_\_

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: X410295

Client: Tasman  
 Client Project ID: Coughlin Red VV 22-1

Checklist Completed by: Jeff Smith  
 Date/time completed: 10/27/14

Shipped Via: HTD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: NA

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

Cooler Number/Temperature: 1 / 15-16 °C \_\_\_\_\_ °C \_\_\_\_\_ °C \_\_\_\_\_ °C (Describe)

Thermometer ID: Tox3

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"/>		<i>Sampled Some Dry</i>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" 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 checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)?</sup>		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>			<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 analytes 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 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 (Project Manager)

10-27-14  
 Date/Time Reviewed

Origins Laboratory, Inc.

*Jeff Pellegrini*

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

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

SW02 @ 8  
 10/27/2014 12:32:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 X410295-01 (Soil)

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4J27009	10/27/2014	10/27/2014	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	88.3 %	59-131			"	"	"	
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**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	4J24016	10/27/2014	10/27/2014	
Benzene	ND	0.0500	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	
Xylenes, total	ND	0.0500	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	94.2 %	70-130			"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.3 %	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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24016 - EPA 5030 (soil)

Blank (4J24016-BLK1)

Prepared: 10/27/2014 Analyzed: 10/27/2014

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0020	"							
Ethylbenzene	ND	0.0020	"							
Xylenes, total	ND	0.0020	"							
Surrogate: 1,2-Dichloroethane-d4	62.2		ug/kg	62.5		99.5	70-130			
Surrogate: Toluene-d8	62.4		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	59.0		"	62.5		94.4	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.*

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24016 - EPA 5030 (soil)

LCS (4J24016-BS1)

Prepared: 10/27/2014 Analyzed: 10/27/2014

Benzene	0.0974	0.0020	mg/kg	0.100		97.4	77.1-124			
Toluene	0.0900	0.0020	"	0.100		90.0	74.5-128			
Ethylbenzene	0.0846	0.0020	"	0.100		84.6	66.4-127			
m,p-Xylene	0.171	0.0040	"	0.200		85.4	76.6-124			
o-Xylene	0.0864	0.0020	"	0.100		86.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	63.0		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	62.6		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	60.7		"	62.5		97.1	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24016 - EPA 5030 (soil)</b>										
<b>Matrix Spike (4J24016-MS1)</b>					<b>Source: X410186-01</b>			<b>Prepared: 10/27/2014</b>	<b>Analyzed: 10/27/2014</b>	<b>QM-07</b>
Benzene	0.0845	0.0020	mg/kg	0.100	ND	84.5	71.8-126			
Toluene	0.0551	0.0020	"	0.100	ND	55.1	65.1-130			
Ethylbenzene	0.0419	0.0020	"	0.100	ND	41.9	62.2-130			
m,p-Xylene	0.0763	0.0040	"	0.200	ND	38.1	46.5-137			
o-Xylene	0.0402	0.0020	"	0.100	0.0023	38.0	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	58.1		ug/kg	62.5		93.0	70-130			
Surrogate: Toluene-d8	56.8		"	62.5		90.8	70-130			
Surrogate: 4-Bromofluorobenzene	55.1		"	62.5		88.2	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 4J24016 - EPA 5030 (soil)

Matrix Spike Dup (4J24016-MSD1)	Source: X410186-01			Prepared: 10/27/2014 Analyzed: 10/27/2014				QM-07	
Benzene	0.0816	0.0020	mg/kg	0.100	ND	81.6	71.8-126	3.56	11.3
Toluene	0.0521	0.0020	"	0.100	ND	52.1	65.1-130	5.60	15.4
Ethylbenzene	0.0373	0.0020	"	0.100	ND	37.3	62.2-130	11.6	19.6
m,p-Xylene	0.0688	0.0040	"	0.200	ND	34.4	46.5-137	10.3	19.2
o-Xylene	0.0338	0.0020	"	0.100	0.0023	31.5	54.2-134	17.5	17.9
Surrogate: 1,2-Dichloroethane-d4	57.8		ug/kg	62.5		92.5	70-130		
Surrogate: Toluene-d8	56.6		"	62.5		90.6	70-130		
Surrogate: 4-Bromofluorobenzene	54.8		"	62.5		87.7	70-130		

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Christine Wasko  
 Project Number: [none]  
 Project: Coughlin Red VV 22-1

**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 8015M - 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 4J27009 - EPA 3580

<b>Blank (4J27009-BLK1)</b>				Prepared: 10/27/2014 Analyzed: 10/27/2014						
Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	50		g	50.0		99.9	59-131			
<b>LCS (4J27009-BS1)</b>				Prepared: 10/27/2014 Analyzed: 10/27/2014						
Diesel (C10-C28)	910	50	mg/kg	1000		90.7	64-121			
Residual Range Organics (C28-C36)	840	200	"	1000		83.8	58-124			
Surrogate: o-Terphenyl	47		g	50.0		94.0	59-131			
<b>Matrix Spike (4J27009-MS1)</b>				<b>Source: X410294-01</b>		Prepared: 10/27/2014 Analyzed: 10/27/2014				
Diesel (C10-C28)	850	50	mg/kg	1000	16	83.7	53-125			
Residual Range Organics (C28-C36)	770	200	"	1000	33	73.3	47-133			
Surrogate: o-Terphenyl	43		g	50.0		85.1	59-131			
<b>Matrix Spike Dup (4J27009-MSD1)</b>				<b>Source: X410294-01</b>		Prepared: 10/27/2014 Analyzed: 10/27/2014				
Diesel (C10-C28)	940	50	mg/kg	1000	16	92.3	53-125	9.64	20	
Residual Range Organics (C28-C36)	890	200	"	1000	33	85.4	47-133	14.5	20	
Surrogate: o-Terphenyl	48		g	50.0		96.1	59-131			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Coughlin Red VV 22-1

---

**Notes and Definitions**

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

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

April 16, 2015

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

**Project Name - KMG - Coughlin Red VV 22-1, 22-2 Project Number - [none]**

Attached are your analytical results for KMG - Coughlin Red VV 22-1, 22-2 received by Origins Laboratory, Inc. April 14, 2015. This project is associated with Origins project number X504183-01.

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 - Coughlin Red VV 22-1, 22-2

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	X504183-01	Water	April 14, 2015 10:01	04/14/2015 17:00
BH02	X504183-02	Water	April 14, 2015 10:05	04/14/2015 17:00
BH03	X504183-03	Water	April 14, 2015 10:11	04/14/2015 17:00
BH04	X504183-04	Water	April 14, 2015 10:15	04/14/2015 17:00
BH05	X504183-05	Water	April 14, 2015 10:20	04/14/2015 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.*

Jen Pellegrini For Noelle Doyle Mathis, President



Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X504183

Client: Tasman  
 Client Project ID: Coughlin Red

Checklist Completed by: Jen Pellegrini  
 Date/time completed: 4/15/15

Shipped Via: Pickup  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: N/A

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

Cooler Number/Temperature: 1 / 4.2 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °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>	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 <sup>1)?</sup>	X			
Was adequate sample volume provided <sup>1)?</sup>	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>1)?</sup>		X		
Is a chain-of-custody (COC) present and filled out completely <sup>1)?</sup>	X			
Does the COC agree with the number and type of sample bottles received <sup>1)?</sup>	X			
Do the sample IDs on the bottle labels match the COC <sup>1)?</sup>	X			
Is the COC properly relinquished by the client with date and time recorded <sup>1)?</sup>	X			
For volatiles in water – is there headspace (> 1/2 inch bubble) present? If yes, contact client and note in narrative.		X		
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)	X			NUL
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.

Jen Pellegrini  
 Reviewed by (Project Manager)

4/15/15  
 Date/Time Reviewed

Origins Laboratory, Inc.

*Jen Pellegrini*

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 - Coughlin Red VV 22-1, 22-2

**BH01**  
**4/14/2015 10:01:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X504183-01 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	5D16007	04/16/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	101 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.9 %	88.6-111			"	"	"	

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 - Coughlin Red VV 22-1, 22-2

BH02  
 4/14/2015 10:05:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X504183-02 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	5D16007	04/16/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	101 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.6 %	88.6-111			"	"	"	

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

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**BH03**  
**4/14/2015 10:11:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X504183-03 (Water)**

**BTEX by EPA 8260C**

Benzene	8.5	1.0	ug/L	1	5D16007	04/16/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	4.7	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	100 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	105 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.5 %	88.6-111			"	"	"	

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

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**BH04**  
**4/14/2015 10:15:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X504183-04 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	5D16007	04/16/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.9 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	90.5 %	88.6-111			"	"	"	

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

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**BH05**  
**4/14/2015 10:20:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X504183-05 (Water)**

**BTEX by EPA 8260C**

Benzene	1.0	1.0	ug/L	1	5D16007	04/16/2015	04/16/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	6.9	1.0	"	"	"	"	"	
Xylenes, total	15.7	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	105 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.0 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**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 5D16007 - EPA 5030B (Water)

Blank (5D16007-BLK1)

Prepared: 04/16/2015 Analyzed: 04/16/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5	104		87.3-113			
Surrogate: Toluene-d8	63		"	62.5	102		90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5	90.8		88.6-111			

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

Tasman Geosciences  
 6899 Pecos Street, Unit C  
 Denver CO 80211

Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**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 5D16007 - EPA 5030B (Water)

LCS (5D16007-BS1)				Prepared: 04/16/2015 Analyzed: 04/16/2015						
Benzene	44.4	1.0	ug/L	50.0	88.7	75-126				
Toluene	46.1	1.0	"	50.0	92.1	78.7-126				
Ethylbenzene	47.3	1.0	"	50.0	94.5	80-130				
m,p-Xylene	94.3	2.0	"	100	94.3	77.2-133				
o-Xylene	46.4	1.0	"	50.0	92.8	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	96.8	87.3-113				
Surrogate: Toluene-d8	64		"	62.5	102	90.9-108				
Surrogate: 4-Bromofluorobenzene	58		"	62.5	92.8	88.6-111				

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Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**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 5D16007 - EPA 5030B (Water)

Matrix Spike (5D16007-MS1)	Source: X504183-01			Prepared: 04/16/2015 Analyzed: 04/16/2015						
Benzene	50.2	1.0	ug/L	50.0	ND	100	74-130			
Toluene	52.8	1.0	"	50.0	ND	106	73-131			
Ethylbenzene	55.2	1.0	"	50.0	ND	110	76-132			
m,p-Xylene	108	2.0	"	100	ND	108	69-139			
o-Xylene	51.5	1.0	"	50.0	ND	103	74-131			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.9	87.3-113			
Surrogate: Toluene-d8	64		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		91.6	88.6-111			

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Bob Cornez  
 Project Number: [none]  
 Project: KMG - Coughlin Red VV 22-1, 22-2

**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 5D16007 - EPA 5030B (Water)

Matrix Spike Dup (5D16007-MSD1)	Source: X504183-01			Prepared: 04/16/2015 Analyzed: 04/16/2015						
Benzene	52.2	1.0	ug/L	50.0	ND	104	74-130	3.79	20	
Toluene	55.3	1.0	"	50.0	ND	111	73-131	4.59	20	
Ethylbenzene	57.6	1.0	"	50.0	ND	115	76-132	4.31	20	
m,p-Xylene	112	2.0	"	100	ND	112	69-139	3.84	20	
o-Xylene	54.1	1.0	"	50.0	ND	108	74-131	4.87	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		98.1	87.3-113			
Surrogate: Toluene-d8	64		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.6	88.6-111			

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Bob Cornez  
Project Number: [none]  
Project: KMG - Coughlin Red VV 22-1, 22-2

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**Notes and Definitions**

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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Jen Pellegrini For Noelle Doyle Mathis, President

# **ATTACHMENT B**

## **WELL COMPLETION DIAGRAMS**

WELL ID: BH01      SITE: Coughlin Red VV 22-1, 22-2  
 DATE: 4/1/2015      Driller: Brandon LeVasseur  
 DRILLING METHOD: AMS Powerprobe 9300-SK  
 SAMPLING EQUIPMENT: macro-core liners

Depth (ft bgs)	Lithology					Well Completion Detail	
	From	To	Material Description <sup>1</sup>	Lab Samples	PID (ppm)		Well Completion Material
0							
1							
2							
3			Hydro-excavation - no recovery				Hydrated Bentonite Chips
4							
5							
6			Borehole geology not logged				Hydrated Granular Bentonite Seal
7							
8							
9							
10							
11			Groundwater interface approximately 11 ft bgs				
12							
13						10-20 Silica Sand	
14							
15							
16							
17							
18							
19			Borehole TD= 19' fl bgs			Threaded PVC End Cap	
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

Notes:  
 1. Material Description to include: Soil type, color; grain size; texture; moisture content; odor

NOTES:  
 Temporary monitoring well was flush mounted.

WELL ID: BH02      SITE: Coughlin Red VV 22-1, 22-2  
 DATE: 4/1/2015      Driller: Brandon LeVasseur  
 DRILLING METHOD: AMS Powerprobe 9300-SK  
 SAMPLING EQUIPMENT: macro-core liners

Depth (ft bgs)	Lithology					Well Completion Detail	
	From	To	Material Description <sup>1</sup>	Lab Samples	PID (ppm)		Well Completion Material
0							
1						1" Diameter Schedule 40 Blank PVC Riser	
2							
3			Hydro-excavation - no recovery				Hydrated Bentonite Chips
4							
5							
6							
7			Borehole geology not logged			Hydrated Granular Bentonite Seal	
8							
9							
10							
11			Groundwater interface approximately 11 ft bgs				
12						1" Diameter Schedule 40 PVC 0.01" Slot Screen	
13							
14							
15							
16							
17							
18							
19							
20			Borehole TD= 19' ft bgs			Threaded PVC End Cap	
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

Notes:  
 1. Material Description to include: Soil type, color; grain size; texture; moisture content; odor

NOTES:  
 Temporary monitoring well was flush mounted.

WELL ID: BH03      SITE: Coughlin Red VV 22-1, 22-2  
 DATE: 4/1/2015      Driller: Brandon LeVasseur  
 DRILLING METHOD: AMS Powerprobe 9300-SK  
 SAMPLING EQUIPMENT: macro-core liners

Depth (ft bgs)	Lithology					Well Completion Detail	
	From	To	Material Description <sup>1</sup>	Lab Samples	PID (ppm)		Well Completion Material
0							
1						1" Diameter Schedule 40 Blank PVC Riser	
2							
3			Hydro-excavation - no recovery				Hydrated Bentonite Chips
4							
5							
6							
7			Borehole geology not logged			Hydrated Granular Bentonite Seal	
8							
9							
10							
11			Groundwater interface approximately 11 ft bgs				
12							
13						10-20 Silica Sand	
14							
15							
16							
17							
18							
19							
20			Borehole TD= 19' ft bgs			Threaded PVC End Cap	
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

Notes:  
 1. Material Description to include: Soil type, color; grain size; texture; moisture content; odor

NOTES:

Temporary monitoring well was flush mounted.

WELL ID: BH04      SITE: Coughlin Red VV 22-1, 22-2  
 DATE: 4/1/2015      Driller: Brandon LeVasseur  
 DRILLING METHOD: AMS Powerprobe 9300-SK  
 SAMPLING EQUIPMENT: macro-core liners

Depth (ft bgs)	Lithology					Well Completion Detail
	From	To	Material Description <sup>1</sup>	Lab Samples	PID (ppm)	
0						
1						1" Diameter Schedule 40 Blank PVC Riser Hydrated Bentonite Chips
2						
3			Hydro-excavation - no recovery			
4						
5						
6						
7			Borehole geology not logged			Hydrated Granular Bentonite Seal
8						
9						1" Diameter Schedule 40 PVC 0.01" Slot Screen 10-20 Silica Sand
10						
11			Groundwater interface approximately 11 ft bgs			
12						
13						
14						
15						
16						
17						
18						
19			Borehole TD= 19' ft bgs			Threaded PVC End Cap
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

Notes:  
 1. Material Description to include: Soil type, color; grain size; texture; moisture content; odor

NOTES:  
 Temporary monitoring well was flush mounted.

WELL ID: BH05      SITE: Coughlin Red VV 22-1, 22-2  
 DATE: 4/1/2015      Driller: Brandon LeVasseur  
 DRILLING METHOD: AMS Powerprobe 9300-SK  
 SAMPLING EQUIPMENT: macro-core liners

Depth (ft bgs)	Lithology					Well Completion Detail	
	From	To	Material Description <sup>1</sup>	Lab Samples	PID (ppm)	Well Completion Material	
0							1" PVC Riser
1							1" Diameter Schedule 40 Blank PVC Riser
2							
3			Hydro-excavation - no recovery			Hydrated Bentonite Chips	
4							
5							
6							
7			Borehole geology not logged			Hydrated Granular Bentonite Seal	
8							
9							
10							
11			Groundwater interface approximately 11 ft bgs				
12							
13						10-20 Silica Sand	
14							
15							
16							
17							
18							
19			Borehole TD= 19' ft bgs				Threaded PVC End Cap
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

Notes:  
 1. Material Description to include: Soil type, color; grain size; texture; moisture content; odor

NOTES: