

State of Colorado Oil and Gas Conservation Commission

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



received 01/29/2016 Project 9479 Spill 437690 Document #: 2211231

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.

OGCC Employee:
Spill Complaint
Inspection NOAV
Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

[X] Spill or Release [] Plug & Abandon [] Central Facility Closure [] Site/Facility Closure [] Other (describe):

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: Phillip Hamlin
Name: 970-336-3500
Fax: 970-336-3656
API/Facility No: 331676 County: Weld
Facility Name: Wirkner-Vance Facility Number: 3C-36HZ
Well Name: Wirkner-Vance Well Number: 3C-36HZ
Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW S36 T3N R67W Latitude: 40.175510 Longitude: -104.846640

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Crude Oil
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.): Other
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Sandy loam and alluvial gravel
Potential receptors (water wells within 1/4 mi, surface waters, etc.): The nearest surface water is located approximately 290' north of the site.
The nearest water well is located approximately 242' northeast of the release area.
Description of Impact (if previously provided, refer to that form or document):
Impacted Media (check): [] Soils [] Vegetation [X] Groundwater [] Surface water
Extent of Impact: See attached data
How Determined: Groundwater sampling and laboratory analysis

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
On June 10, 2014, approximately 3 barrels of crude oil were released into a lined secondary containment during construction and anchoring activities at the Wirkner-Vance 3C-36HZ production facility. Approximately 2.75 barrels of oil were recovered using a vacuum truck and transferred to a licensed injection facility for disposal. Soil impacts below the liner were not encountered. Groundwater was encountered in a temporary anchor pothole at approximately 6 feet below ground surface (bgs). An Initial Form 19 was submitted to the COGCC on June 12, 2014 (COGCC Document No. 400624490), and a Supplemental Form 19 was submitted on June 21, 2014 (COGCC Document No. 400630825). The COGCC has issued Spill Tracking number 437690 for this release.
Describe how source is to be removed:
Although a liner was present at the location, it was temporarily breached to allow for tank anchor installation. The released material infiltrated the open anchor potholes and subsequently impacted groundwater, which was encountered at approximately 6 feet bgs in the temporary potholes. No soil was impacted by the release. On June 10, 2014, a groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX. Analytical results received on June 10, 2014, indicated that the benzene, toluene, and total xylenes concentrations in sample GW01 were above the applicable COGCC Table 910-1 groundwater standards. Groundwater analytical results are summarized in Table 1. Groundwater grab 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.:
Additional groundwater monitoring and remediation measures are described on the following page.

State of Colorado Oil and Gas Conservation Commission

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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.): On April 30, 2015, and June 15, 2015, six temporary groundwater monitoring/remediation wells (BH01-BH06) were installed at the site to further assess the extent of groundwater impacts.

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. 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: No soil was impacted by the release. Temporary monitoring/remediation wells have been installed to further assess groundwater impacts and additional wells will be installed on the south side of the release location so that groundwater points of compliance may be achieved.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Recovered crude oil was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 6/10/2014 Date Site Investigation Completed: Remediation Plan Submitted: Remediation Start Date: 6/10/2014 Anticipated Completion Date: 1/15/2017 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: 1/29/16

OGCC Approved: Title: Date:

FIGURES



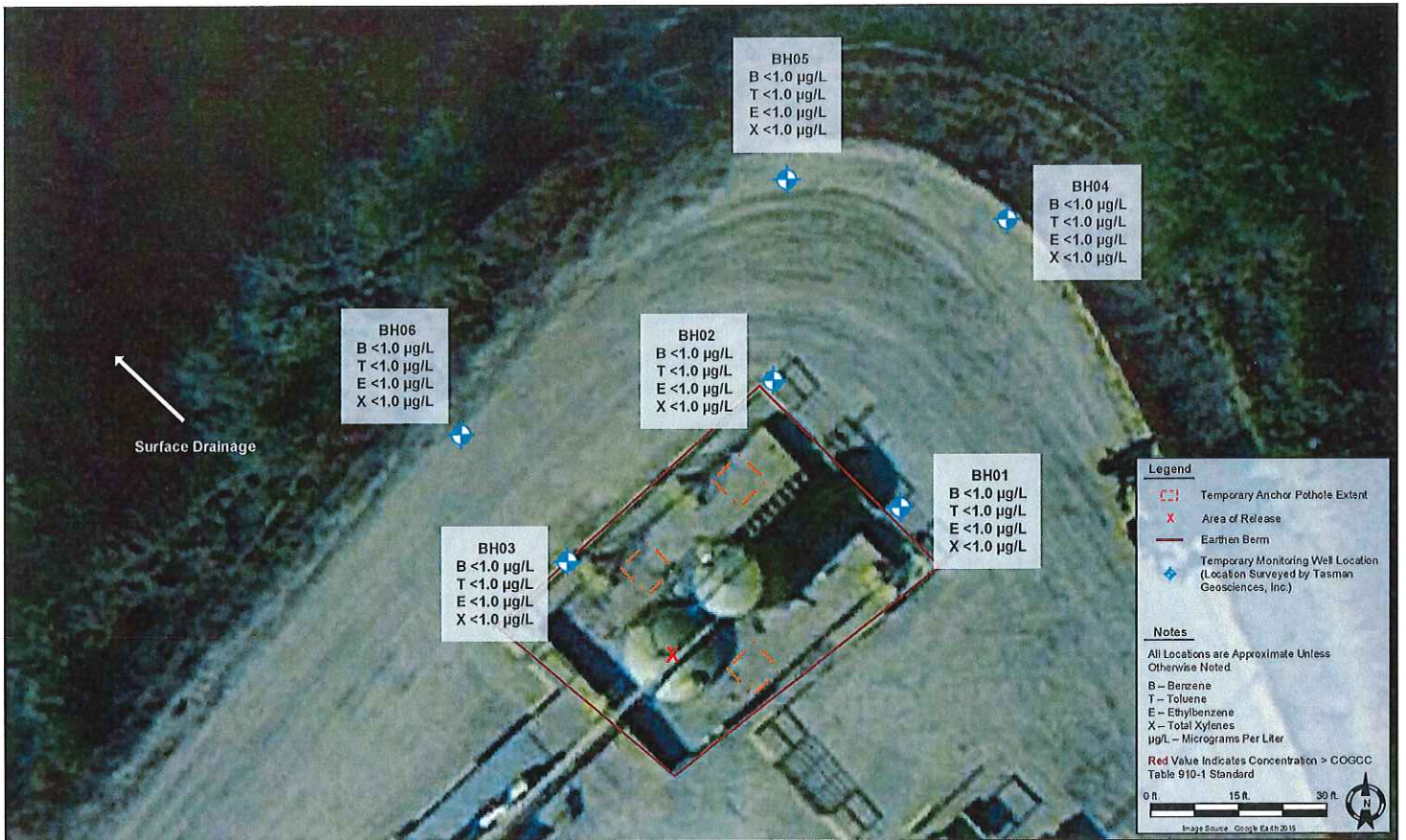
DATE: November 9, 2015
 DESIGNED BY: R. Bruner
 DRAWN BY: R. Bruner



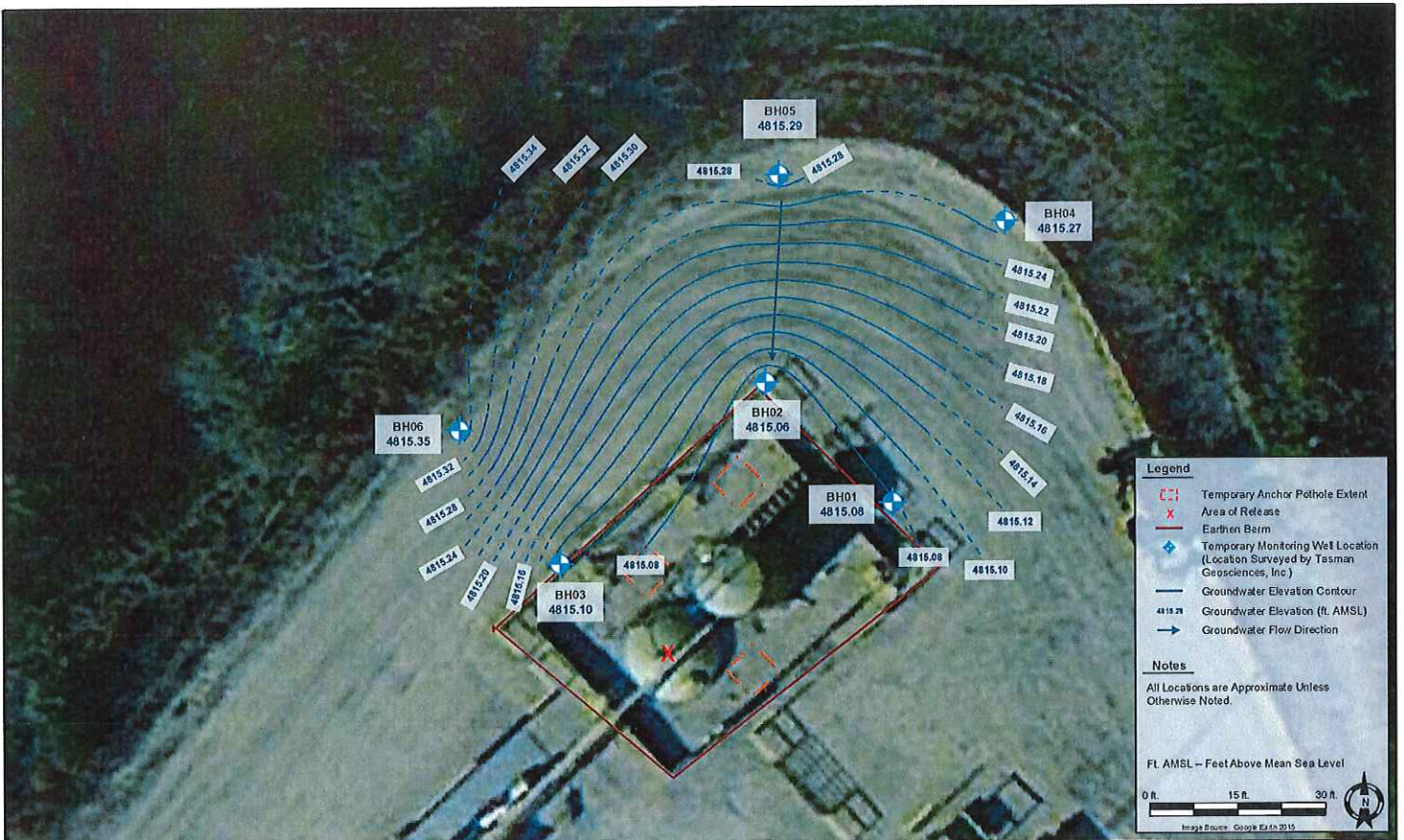
Kerr-McGee Oil and Gas Onshore, LP
 WIRKNER-VANCE 3C-36HZ
 SWSW, Section 36, Township 3 North, Range 67 West
 Weld County, Colorado

Sample Location
 Map

FIGURE
 1



DATE December 1, 2015		Kerr-McGee Oil and Gas Onshore, LP WIRKNER-VANCE 3C-36HZ SWSW, Section 36, Township 3 North, Range 67 West Weld County, Colorado	Groundwater Sample Results Map (11/05/2015)	FIGURE 2
DESIGNED BY: R. Bruner				
DRAWN BY: R. Bruner				



DATE: December 1, 2015

DESIGNED BY: R. Bruner

DRAWN BY: R. Bruner



Kerr-McGee Oil and Gas Onshore, LP
 WIRKNER-VANCE 3C-36HZ
 SWSW, Section 36, Township 3 North, Range 67 West
 Weld County, Colorado

Groundwater Elevation Contour
 Map (11/05/2015)

FIGURE
 3

**ANALYTICAL
TABLE**

TABLE 1
WIRKNER-VANCE 3C-36HZ
GROUNDWATER 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	06/10/14	6,732	7,088	292	3,507	~6
BH01	05/07/15	<1.0	<1.0	<1.0	<1.0	5.71
BH01	08/07/15	<1.0	<1.0	<1.0	<1.0	5.02
BH01	11/05/15	<1.0	<1.0	<1.0	<1.0	5.92
BH02	05/07/15	514	<1.0	<1.0	48.9	6.09
BH02	08/07/15	1380	<1.0	72.0	4.8	5.41
BH02	11/05/15	<1.0	<1.0	<1.0	<1.0	6.29
BH03	05/07/15	6.8	<1.0	<1.0	<1.0	6.16
BH03	08/07/15	<1.0	<1.0	<1.0	<1.0	5.46
BH03	11/05/15	<1.0	<1.0	<1.0	<1.0	6.34
BH04	08/07/15	<1.0	<1.0	<1.0	<1.0	5.92
BH04	11/05/15	<1.0	<1.0	<1.0	<1.0	6.77
BH05	08/07/15	4.4	<1.0	<1.0	<1.0	5.04
BH05	11/05/15	<1.0	<1.0	<1.0	<1.0	6.87
BH06	08/07/15	<1.0	<1.0	<1.0	<1.0	5.94
BH06	11/05/15	<1.0	<1.0	<1.0	<1.0	6.78

Notes:

1. Standards for groundwater 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

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**

Test Report

eANALYTICS LABORATORY

June 10, 2014

Client: Tasman Geosciences / Anadarko
Project: Wirkner-Vance 3C-36HZ
Lab ID: 1566
Date Samples Received: 6/10/2014
Number of Samples: 1
Sample Condition: Samples arrived intact and in appropriate sample containers
Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you.

Sincerely,



Christopher Dieken
Quality Assurance Manager



Todd Rhea
Laboratory Manager

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

The results contained within this report relate only to the items analyzed

Page 1 of 5

Water
Quality Control - Surrogate Recoveries



Client: Tasman Geosciences / Anadarko

Lab ID: 1566

Project: Wirkner-Vance 3C-36HZ

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
GW01	99	102	107	94	06/10/14	06/10/14	1566 1

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS
LABORATORY

Client: Tasman Geosciences / Anadarko Lab ID: 1566
 Project: Wirkner-Vance 3C-36HZ
 Analysis: Volatile Organics Method: EPA8260

Sample Name	Benzene % Rec	Toluene % Rec	Ethyl- benzene % Rec	Total Xylenes % Rec	Date Analyzed	Lab ID
Laboratory Control (70-130%)	89	89	100	92	06/10/14	LCS 1566 1
Method Blank	< 1.0 ug/L	< 1.0 ug/L	< 1.0 ug/L	< 1.0 ug/L	06/10/14	MB 1566 1

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538



May 12, 2015

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Wirkner Vance 3C-36Hz Project Number - [none]

Attached are your analytical results for KMG - Wirkner Vance 3C-36Hz received by Origins Laboratory, Inc. May 07, 2015. This project is associated with Origins project number X505065-01.

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

Bob Cornez
Project Number: [none]
Project: KMG - Wirkner Vance 3C-36Hz

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	X505065-01	Water	May 7, 2015 9:55	05/07/2015 16:45
BH02	X505065-02	Water	May 7, 2015 9:59	05/07/2015 16:45
BH03	X505065-03	Water	May 7, 2015 10:03	05/07/2015 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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X56506S

Client: Tasman
 Client Project ID: Wirkner Vance

Checklist Completed by: Jen Pellegrini
 Date/time completed: 5/18/15

Shipped Via: HIP
 (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 19.3 °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 ^{(1)?}		<input checked="" type="checkbox"/>		<u>sampled same day</u>
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 ^{(1)?}	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ^{(1)?}	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ^{(1)?}		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ^{(1)?}	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ^{(1)?}	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ^{(1)?}	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ^{(1)?}	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
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 Na ₂ CO ₃ +NaOH, ZnAc ₂ +NaOH)	<input checked="" type="checkbox"/>			<u>HCL</u>
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.

Reviewed by (Project Manager) _____

Date/Time Reviewed 5/18/15

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 - Wirkner Vance 3C-36Hz

BH01
5/7/2015 9:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X505065-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5E08010	05/08/2015	05/11/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	101 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	97.9 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Wirkner Vance 3C-36Hz

BH02

5/7/2015 9:59:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X505065-02 (Water)

BTEX by EPA 8260C

Benzene	514	4.0	ug/L	4	5E08010	05/08/2015	05/11/2015	
Toluene	ND	1.0	"	1	"	"	05/11/2015	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	48.9	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	97.8 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.2 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	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 - Wirkner Vance 3C-36Hz

BH03

5/7/2015 10:03:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X505065-03 (Water)

BTEX by EPA 8260C

Benzene	6.8	1.0	ug/L	1	5E08010	05/08/2015	05/11/2015	
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	100 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 5E08010 - EPA 5030B (Water)

Blank (5E08010-BLK1)

Prepared: 05/08/2015 Analyzed: 05/11/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.8	87.3-113			
Surrogate: Toluene-d8	62		"	62.5		99.1	90.9-108			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.2	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 - Wirkner Vance 3C-36Hz

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 5E08010 - EPA 5030B (Water)

LCS (5E08010-BS1)				Prepared: 05/08/2015 Analyzed: 05/11/2015						
Benzene	43.1	1.0	ug/L	50.0	86.1	75-126				
Toluene	42.8	1.0	"	50.0	85.6	78.7-126				
Ethylbenzene	44.4	1.0	"	50.0	88.9	80-130				
m,p-Xylene	89.7	2.0	"	100	89.7	77.2-133				
o-Xylene	43.0	1.0	"	50.0	86.0	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	98.0	87.3-113				
Surrogate: Toluene-d8	61		"	62.5	98.3	90.9-108				
Surrogate: 4-Bromofluorobenzene	61		"	62.5	98.3	88.6-111				

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

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 5E08010 - EPA 5030B (Water)

Matrix Spike (5E08010-MS1)	Source: X505062-02			Prepared: 05/08/2015 Analyzed: 05/11/2015						
Benzene	49.1	1.0	ug/L	50.0	ND	98.2	74-130			
Toluene	49.8	1.0	"	50.0	ND	99.7	73-131			
Ethylbenzene	51.7	1.0	"	50.0	ND	103	76-132			
m,p-Xylene	104	2.0	"	100	ND	104	69-139			
o-Xylene	48.7	1.0	"	50.0	ND	97.3	74-131			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.8	87.3-113			
Surrogate: Toluene-d8	62		"	62.5		99.9	90.9-108			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	88.6-111			

Origins Laboratory, Inc.



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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 5E08010 - EPA 5030B (Water)

Matrix Spike Dup (5E08010-MSD1)	Source: X505062-02			Prepared: 05/08/2015 Analyzed: 05/11/2015						
Benzene	46.3	1.0	ug/L	50.0	ND	92.6	74-130	5.83	20	
Toluene	47.2	1.0	"	50.0	ND	94.3	73-131	5.55	20	
Ethylbenzene	48.7	1.0	"	50.0	ND	97.4	76-132	5.96	20	
m,p-Xylene	90.0	2.0	"	100	ND	90.0	69-139	14.6	20	
o-Xylene	43.1	1.0	"	50.0	ND	86.1	74-131	12.2	20	
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		98.6	87.3-113			
Surrogate: Toluene-d8	62		"	62.5		100	90.9-108			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	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 - Wirkner Vance 3C-36Hz

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.

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.



August 13, 2015

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Wirkner Vance 3C-36Hz **Project Number - [none]**

Attached are your analytical results for KMG - Wirkner Vance 3C-36Hz received by Origins Laboratory, Inc. August 07, 2015. This project is associated with Origins project number X508082-01.

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

Bob Cornez
Project Number: [none]
Project: KMG - Wirkner Vance 3C-36Hz

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	X508082-01	Water	August 7, 2015 11:20	08/07/2015 14:55
BH02	X508082-02	Water	August 7, 2015 11:23	08/07/2015 14:55
BH03	X508082-03	Water	August 7, 2015 11:28	08/07/2015 14:55
BH04	X508082-04	Water	August 7, 2015 11:33	08/07/2015 14:55
BH05	X508082-05	Water	August 7, 2015 11:34	08/07/2015 14:55
BH06	X508082-06	Water	August 7, 2015 11:40	08/07/2015 14:55

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 - Wirkner Vance 3C-36Hz

www.originslaboratory.com

X508082

page 1 of 1

ORIGINS
 LABORATORY, INC

Client: Tasman Geo
 Address: _____
 Project Manager: Bob Cornez
 Project Name: Wirkner Vance 3C-36Hz
 Project Number: _____
 Telephone Number: 352 262 9910
 Email Address: ccornee@tasmangeo.com
 Samples Collected By: Kate Forsman

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative			Matrix			Analyte	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil		
BH01	8/7/15	1120	3	X	X	X	X	X		BTEX 8260	1
BH02		1123	1	X							2
BH03		1128	1	X							3
BH04		1133	1								4
BH05		1134	1								5
BH06		1140	1								6
											7
											8
											9
											10
Relinquished By: <u>[Signature]</u>	Date: 8/7/15	Time: 1450	Received By: <u>[Signature]</u>	Date: 8/7/15	Time: 1455	Turnaround Time: 24 Hr <input type="checkbox"/>	48 Hr <input type="checkbox"/>	72 Hr <input type="checkbox"/>	Standard <input checked="" type="checkbox"/>		
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____						

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

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS08082 Client: Tasman
 Client Project ID: KMG - Wirkner Vance
 Checklist Completed by: Jan Pellegrini Shipped Via: HLI
 Date/time completed: 8/10/15 (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, RL °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 ⁽¹⁾ ?		<input checked="" type="checkbox"/>		<u>Sampled same day</u>
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 ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input checked="" type="checkbox"/>			<u>Viols B + C on BH-06 Viols C on BH04</u>
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)	<input checked="" type="checkbox"/>			<u>HCL</u>
Additional Comments (if any): <u>Bob C. was notified by email regarding sample headspace</u>				

⁽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.

Jan Pellegrini
 Reviewed by (Project Manager)

8/10/15
 Date/Time Reviewed

Origins Laboratory, Inc.

Jan Pellegrini

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

BH01
8/7/2015 11:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508082-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	113 %	84-121			"	"	"	
Surrogate: Toluene-d8	98.3 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.6 %	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 - Wirkner Vance 3C-36Hz

BH02

8/7/2015 11:23:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508082-02 (Water)

BTEX by EPA 8260C

Benzene	1380	20.0	ug/L	20	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	1	"	"	08/12/2015	
Ethylbenzene	72.0	1.0	"	"	"	"	"	
Xylenes, total	4.8	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	111 %	84-121			"	"	"	
Surrogate: Toluene-d8	97.7 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.0 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH03

8/7/2015 11:28:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X508082-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	114 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.4 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.1 %	84-114			"	"	"	

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 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

BH04
8/7/2015 11:33:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508082-04 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	111 %	84-121			"	"	"	
Surrogate: Toluene-d8	98.5 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	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 - Wirkner Vance 3C-36Hz

BH05
8/7/2015 11:34:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508082-05 (Water)

BTEX by EPA 8260C

Benzene	4.4	1.0	ug/L	1	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	112 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.5 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.6 %	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 - Wirkner Vance 3C-36Hz

BH06

8/7/2015 11:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X508082-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	5H11015	08/11/2015	08/12/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	113 %	84-121			"	"	"	
Surrogate: Toluene-d8	100 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	84-114			"	"	"	

Origins Laboratory, Inc.



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6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Blank (5H11015-BLK1)

Prepared: 08/11/2015 Analyzed: 08/12/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.1	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		95.6	84-114			

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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Blank (5H11015-BLK2)

Prepared: 08/11/2015 Analyzed: 08/12/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	70		"	62.5	112		84-121			
Surrogate: Toluene-d8	61		"	62.5	98.4		85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5	99.7		84-114			

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Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

LCS (5H11015-BS1)

Prepared: 08/11/2015 Analyzed: 08/12/2015

Benzene	51.8	1.0	ug/L	50.0	104	75-126				
Toluene	52.6	1.0	"	50.0	105	78.7-126				
Ethylbenzene	53.0	1.0	"	50.0	106	80-130				
m,p-Xylene	104	2.0	"	100	104	77.2-133				
o-Xylene	52.5	1.0	"	50.0	105	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5	93.5	84-121				
Surrogate: Toluene-d8	63		"	62.5	100	85-115				
Surrogate: 4-Bromofluorobenzene	61		"	62.5	97.3	84-114				

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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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

LCS (5H11015-BS2)				Prepared: 08/11/2015 Analyzed: 08/12/2015						
Benzene	48.7	1.0	ug/L	50.0		97.5	75-126			
Toluene	46.5	1.0	"	50.0		93.0	78.7-126			
Ethylbenzene	48.2	1.0	"	50.0		96.4	80-130			
m,p-Xylene	95.8	2.0	"	100		95.8	77.2-133			
o-Xylene	50.0	1.0	"	50.0		99.9	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		106	84-121			
Surrogate: Toluene-d8	61		"	62.5		98.3	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		96.9	84-114			

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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Matrix Spike (5H11015-MS1)	Source: X508082-01			Prepared: 08/11/2015 Analyzed: 08/12/2015						
Benzene	54.9	1.0	ug/L	50.0	ND	110	74-130			
Toluene	53.2	1.0	"	50.0	ND	106	73-131			
Ethylbenzene	55.9	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	112	2.0	"	100	ND	112	69-139			
o-Xylene	54.7	1.0	"	50.0	ND	109	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	84-121			
Surrogate: Toluene-d8	61		"	62.5		98.3	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.4	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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Matrix Spike (5H11015-MS2)	Source: X508082-02			Prepared: 08/11/2015 Analyzed: 08/12/2015						
Benzene	1180	1.0	ug/L	50.0	1380	NR	74-130			QM-4X
Toluene	51.3	1.0	"	50.0	ND	103	73-131			
Ethylbenzene	138	1.0	"	50.0	72.0	132	76-132			
m,p-Xylene	113	2.0	"	100	4.8	108	69-139			
o-Xylene	53.4	1.0	"	50.0	ND	107	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	61		"	62.5		96.8	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Matrix Spike Dup (5H11015-MSD1)	Source: X508082-01			Prepared: 08/11/2015 Analyzed: 08/12/2015						
Benzene	53.8	1.0	ug/L	50.0	ND	108	74-130	2.15	20	
Toluene	52.6	1.0	"	50.0	ND	105	73-131	1.02	20	
Ethylbenzene	55.5	1.0	"	50.0	ND	111	76-132	0.628	20	
m,p-Xylene	110	2.0	"	100	ND	110	69-139	1.99	20	
o-Xylene	54.9	1.0	"	50.0	ND	110	74-131	0.365	20	
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		107	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.7	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.1	84-114			

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 - Wirkner Vance 3C-36Hz

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 5H11015 - EPA 5030B (Water)

Matrix Spike Dup (5H11015-MSD2)	Source: X508082-02			Prepared: 08/11/2015 Analyzed: 08/12/2015						
Benzene	1230	1.0	ug/L	50.0	1380	NR	74-130	4.42	20	QM-4X
Toluene	53.4	1.0	"	50.0	ND	107	73-131	3.99	20	
Ethylbenzene	140	1.0	"	50.0	72.0	136	76-132	1.50	20	QM-07
m,p-Xylene	117	2.0	"	100	4.8	112	69-139	3.56	20	
o-Xylene	56.2	1.0	"	50.0	ND	112	74-131	5.18	20	
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		107	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.4	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.7	84-114			

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 - Wirkner Vance 3C-36Hz

Notes and Definitions

- QM-4X The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
- 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



November 10, 2015

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver CO 80211

Project Name - KMG - Wirkner Vance 3C-36Hz

Project Number - [none]

Attached are your analytical results for KMG - Wirkner Vance 3C-36Hz received by Origins Laboratory, Inc. November 05, 2015. This project is associated with Origins project number X511079-01.

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

Bob Cornez
Project Number: [none]
Project: KMG - Wirkner Vance 3C-36Hz

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	X511079-01	Water	November 5, 2015 11:06	11/05/2015 15:40
BH02	X511079-02	Water	November 5, 2015 11:15	11/05/2015 15:40
BH03	X511079-03	Water	November 5, 2015 11:24	11/05/2015 15:40
BH04	X511079-04	Water	November 5, 2015 11:08	11/05/2015 15:40
BH05	X511079-05	Water	November 5, 2015 11:18	11/05/2015 15:40
BH06	X511079-06	Water	November 5, 2015 11:30	11/05/2015 15:40

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 - Wirkner Vance 3C-36Hz

www.originslaboratory.com

YS11079

ORIGINS
 LABORATORY, INC

page 1 of 1

Client: **Tasman Geo**
 Project Manager: **Bob Cornez**
 Address: [Blank]
 Project Name: **Wirkner Vance 3C-36Hz**
 Project Number: [Blank]
 Telephone Number: **303-262-9910**
 Email Address: **ccornez@tasman-geo.com**
 Samples Collected By: **Kak F**

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions		
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	All Samples #			Other	
B101	11/05/15	1102	5	X				X					1	
B102		1115	1										2	
B103		1124	1										3	
B104		1108	1										4	
B105		1118	1										5	
B106		1130	1										6	
													7	
													8	
													9	
													10	
Relinquished By: [Signature]	Date: 11/05/15	Time: 1510		Received By: [Signature]	Date: 11/05/15	Time: 1550		Turnaround Time: Standard <input checked="" type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> 24 Hr						

Date Results Needed: [Blank]

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

Origins Laboratory, Inc.

Jefe 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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences
 6899 Pecos Street, Unit C
 Denver CO 80211

Bob Cornez
 Project Number: [none]
 Project: KMG - Wirkner Vance 3C-36Hz

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS11079

Client: Tasman

Client Project ID: KMG-Wirkner Vance

Checklist Completed by: Jesse Smith

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

Date/time completed: 11/6/11

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 19.8 °C 1 °C 1 °C 1 °C (Describe)

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		sampled same day
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		
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 Na ₂ SO ₃ +NaOH, ZnAc ₂ +NaOH)	X			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.

Jesse Smith
 Reviewed by (Project Manager)

11/6/11
 Date/Time Reviewed

Origins Laboratory, Inc.

Jesse 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 - Wirkner Vance 3C-36Hz

BH01
 11/5/2015 11:06:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X511079-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	100 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.7 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH02

11/5/2015 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X511079-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	100 %	84-121			"	"	11/06/2015	
<i>Surrogate: Toluene-d8</i>	98.6 %	85-115			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	98.8 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH03
11/5/2015 11:24:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511079-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97.8 %	84-121			"	"	"	
<i>Surrogate: Toluene-d8</i>	100 %	85-115			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	98.8 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH04
11/5/2015 11:08:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511079-04 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH05
11/5/2015 11:18:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511079-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	100 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.0 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

BH06
11/5/2015 11:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511079-06 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	B5K0606	11/06/2015	11/06/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	98.3 %	84-121			"	"	"	
Surrogate: Toluene-d8	99.0 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.6 %	84-114			"	"	"	

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 - Wirkner Vance 3C-36Hz

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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch B5K0606 - EPA 5030B (Water)

Blank (B5K0606-BLK1)

Prepared: 11/06/2015 Analyzed: 11/06/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		100	84-121			
Surrogate: Toluene-d8	62		"	62.5		98.7	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.9	84-114			

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 - Wirkner Vance 3C-36Hz

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 B5K0606 - EPA 5030B (Water)

LCS (B5K0606-BS1)				Prepared: 11/06/2015 Analyzed: 11/06/2015						
Benzene	54.8	1.0	ug/L	50.0	110	75-126				
Toluene	53.6	1.0	"	50.0	107	78.7-126				
Ethylbenzene	53.1	1.0	"	50.0	106	80-130				
m,p-Xylene	105	2.0	"	100	105	77.2-133				
o-Xylene	52.9	1.0	"	50.0	106	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5	103	84-121				
Surrogate: Toluene-d8	62		"	62.5	99.6	85-115				
Surrogate: 4-Bromofluorobenzene	62		"	62.5	99.5	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 - Wirkner Vance 3C-36Hz

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 B5K0606 - EPA 5030B (Water)

Matrix Spike (B5K0606-MS1)	Source: X511076-01			Prepared: 11/06/2015 Analyzed: 11/06/2015						
Benzene	45.4	1.0	ug/L	50.0	ND	90.7	74-130			
Toluene	44.7	1.0	"	50.0	ND	89.3	73-131			
Ethylbenzene	48.2	1.0	"	50.0	ND	96.4	76-132			
m,p-Xylene	94.8	2.0	"	100	ND	94.8	69-139			
o-Xylene	48.3	1.0	"	50.0	ND	96.6	74-131			
Surrogate: 1,2-Dichloroethane-d4	71		"	62.5		114	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.6	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	84-114			

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 - Wirkner Vance 3C-36Hz

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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch B5K0606 - EPA 5030B (Water)

Matrix Spike Dup (B5K0606-MSD1)	Source: X511076-01			Prepared: 11/06/2015 Analyzed: 11/06/2015						
Benzene	54.0	1.0	ug/L	50.0	ND	108	74-130	17.4	20	
Toluene	54.5	1.0	"	50.0	ND	109	73-131	19.9	20	
Ethylbenzene	52.5	1.0	"	50.0	ND	105	76-132	8.54	20	
m,p-Xylene	104	2.0	"	100	ND	104	69-139	9.15	20	
o-Xylene	53.1	1.0	"	50.0	ND	106	74-131	9.41	20	
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.4	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.0	84-114			

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 - Wirkner Vance 3C-36Hz

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.

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

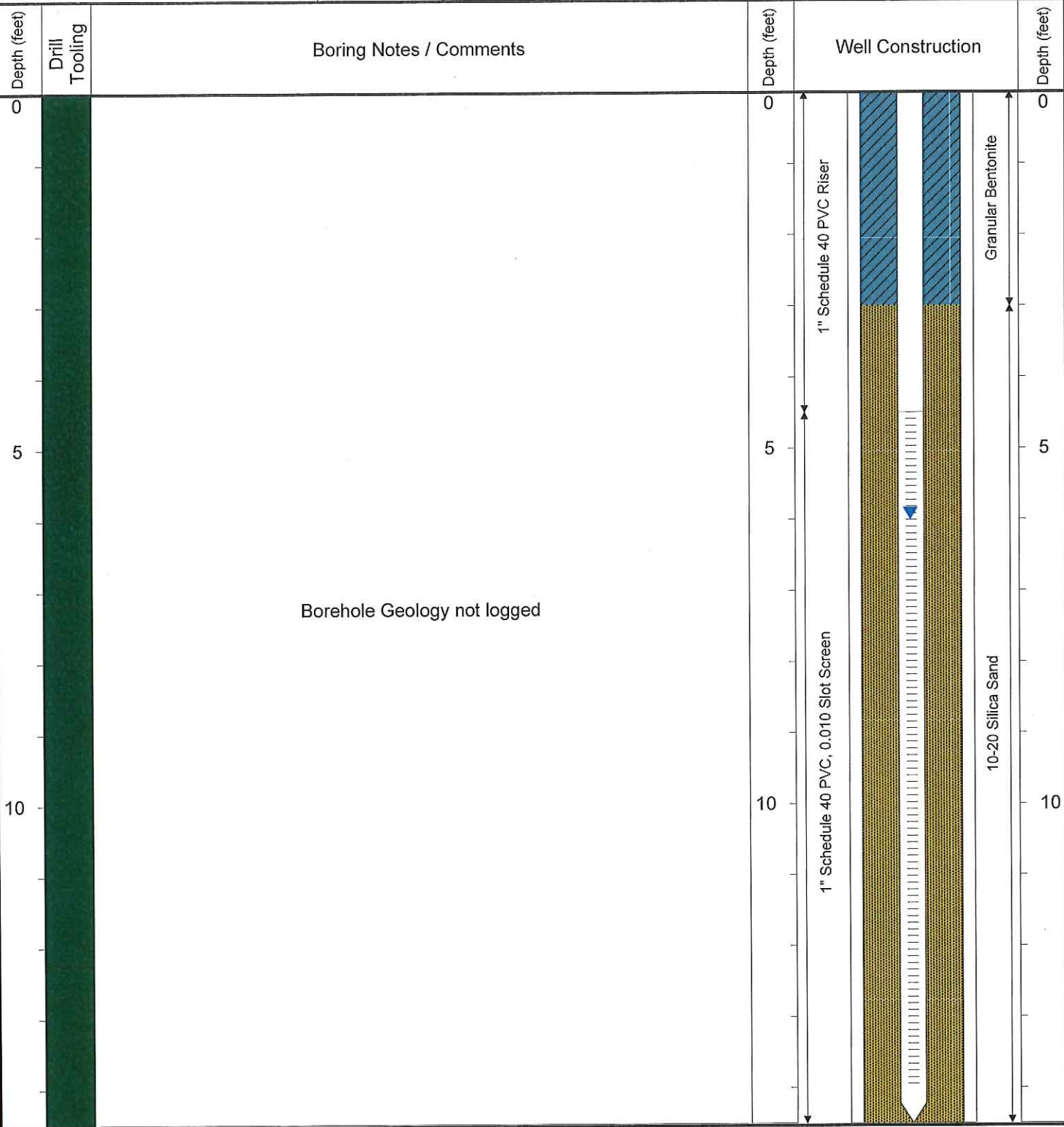
**ATTACHMENT B
WELL COMPLETION
LOGS**



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
DRILLED BY: Brandon LeVasseur
PROJECT MANAGER: Robert Cornez
DRILLING CONTRACTOR: Tasman Geosciences
DRILLING EQUIPMENT: AMS Powerprobe
DRILL BIT SIZE (INCHES): 2 3/8"
DATE STARTED - COMPLETED: 4/30/2015
TOTAL WELL DEPTH (FT. BGS): 14.5
DEPTH TO WATER (FT. BGS): 5.92 (11/05/15) ▼

Wirkner-Vance 3C-36HZ
BORING / WELL ID: BH01
SURFACE COMPLETION: Flush Mount
LATITUDE (UTM - NAD 83): 40.176761
LONGITUDE (UTM - NAD 83): -104.845398
CASING ELEVATION (FT. AMSL): 4754.453
GROUND ELEVATION (FT. AMSL): Not surveyed



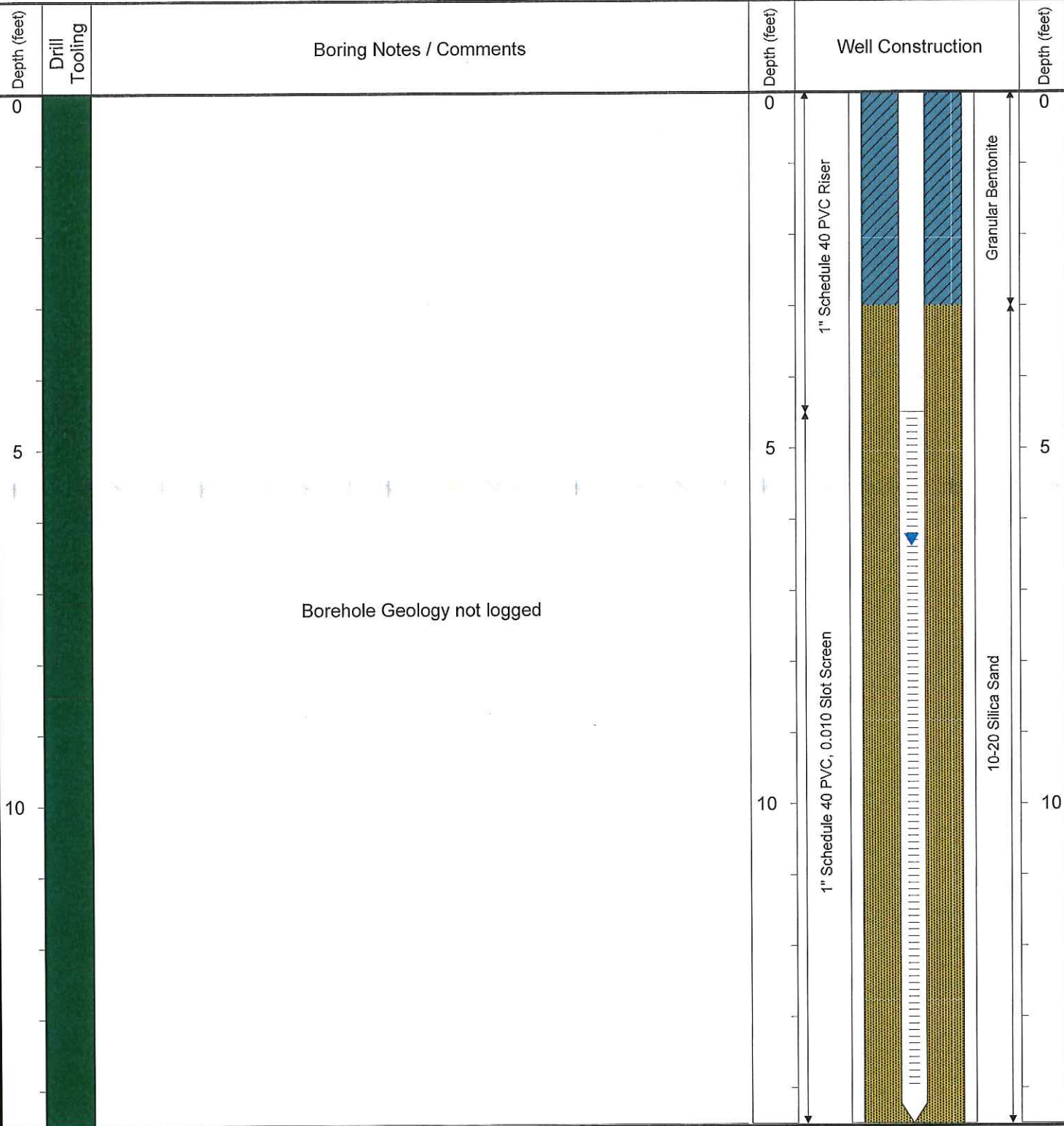
Drilling / Sample Method:	
Solid-Stem Auger	Perforated Injection Tool
Direct Push - Expendable Well Tip	



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
DRILLED BY: Brandon LeVasseur
PROJECT MANAGER: Robert Cornez
DRILLING CONTRACTOR: Tasman Geosciences
DRILLING EQUIPMENT: AMS Powerprobe
DRILL BIT SIZE (INCHES): 2 3/8"
DATE STARTED - COMPLETED: 4/30/2015
TOTAL WELL DEPTH (FT. BGS): 14.5
DEPTH TO WATER (FT. BGS): 6.29 (11/05/15) ▼

Wirkner-Vance 3C-36HZ
BORING / WELL ID: BH02
SURFACE COMPLETION: Flush Mount
LATITUDE (UTM - NAD 83): 40.176818
LONGITUDE (UTM - NAD 83): -104.845476
CASING ELEVATION (FT. AMSL): 4827.91
GROUND ELEVATION (FT. AMSL): Not surveyed



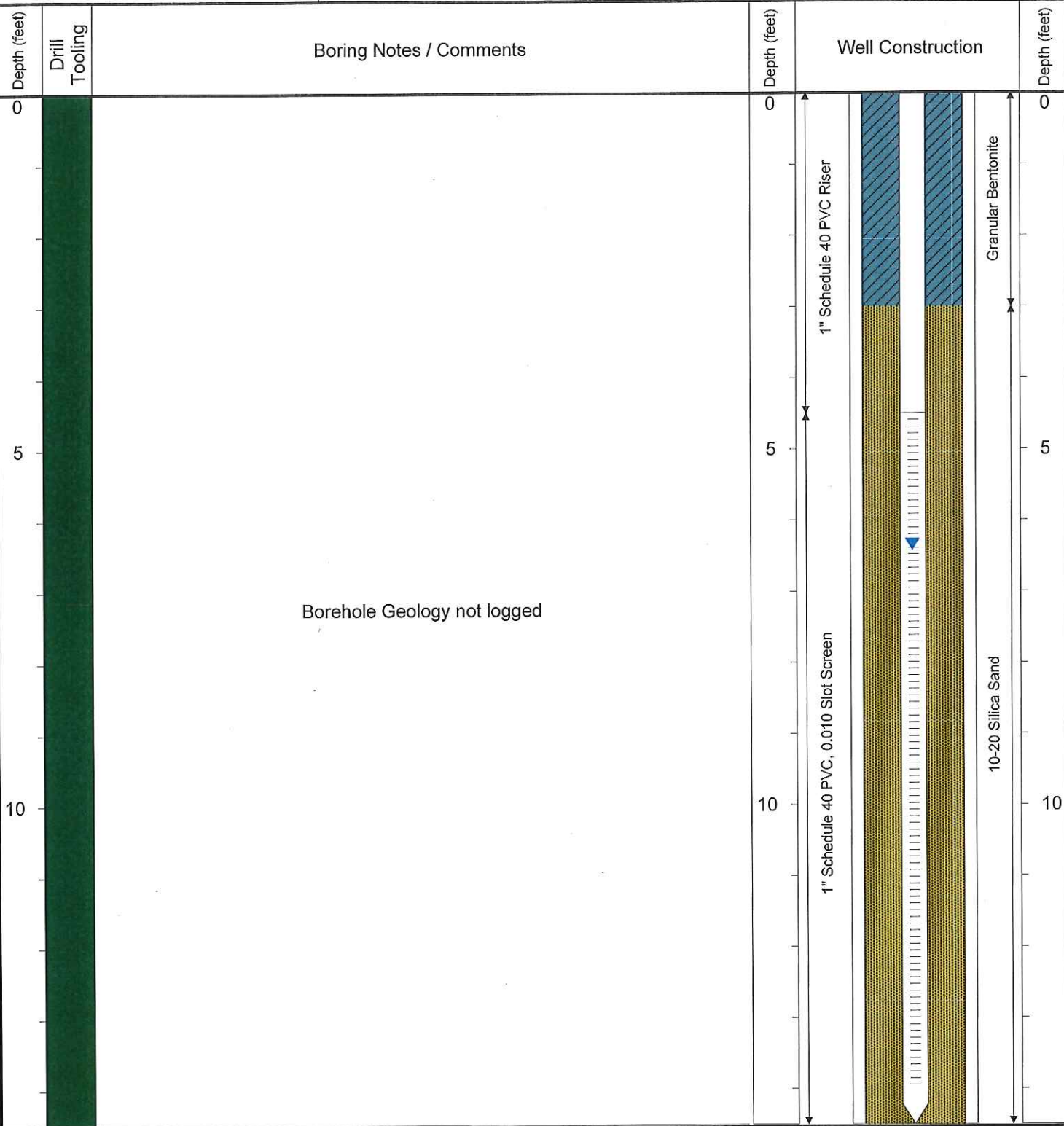
Drilling / Sample Method:	
Solid-Stem Auger	Perforated Injection Tool
Direct Push - Expendable Well Tip	



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
DRILLED BY: Brandon LeVasseur
PROJECT MANAGER: Robert Cornez
DRILLING CONTRACTOR: Tasman Geosciences
DRILLING EQUIPMENT: AMS Powerprobe
DRILL BIT SIZE (INCHES): 2 3/8"
DATE STARTED - COMPLETED: 4/30/2015
TOTAL WELL DEPTH (FT. BGS): 14.5
DEPTH TO WATER (FT. BGS): 6.34 (11/05/15) ▼

Wirkner-Vance 3C-36HZ
BORING / WELL ID: BH03
SURFACE COMPLETION: Flush Mount
LATITUDE (UTM - NAD 83): 40.176735
LONGITUDE (UTM - NAD 83): -104.845599
CASING ELEVATION (FT. AMSL): 4828
GROUND ELEVATION (FT. AMSL): Not surveyed



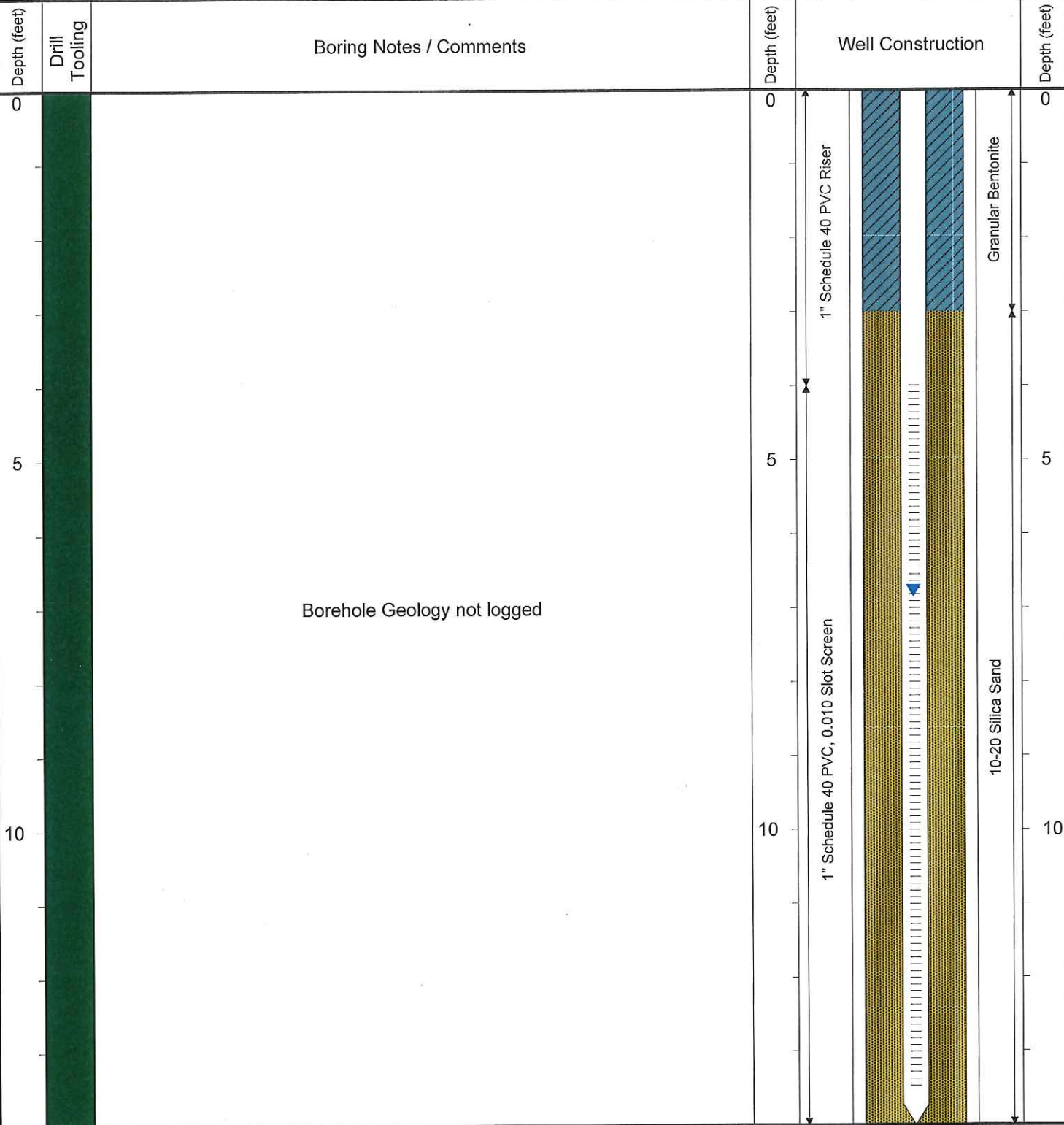
Drilling / Sample Method:	
Solid-Stem Auger	Perforated Injection Tool
Direct Push - Expendable Well Tip	



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
 DRILLED BY: Brandon LeVasseur
 PROJECT MANAGER: Robert Cornez
 DRILLING CONTRACTOR: Tasman Geosciences
 DRILLING EQUIPMENT: AMS Powerprobe
 DRILL BIT SIZE (INCHES): 2 3/8"
 DATE STARTED - COMPLETED: 6/15/2015
 TOTAL WELL DEPTH (FT. BGS): 14
 DEPTH TO WATER (FT. BGS): 6.77 (11/05/15)

Wirkner-Vance 3C-36HZ
 BORING / WELL ID: BH04
 SURFACE COMPLETION: Flush Mount
 LATITUDE (UTM - NAD 83): 40.176893
 LONGITUDE (UTM - NAD 83): -104.845334
 CASING ELEVATION (FT. AMSL): 4828.6
 GROUND ELEVATION (FT. AMSL): 4828.73



Drilling / Sample Method:

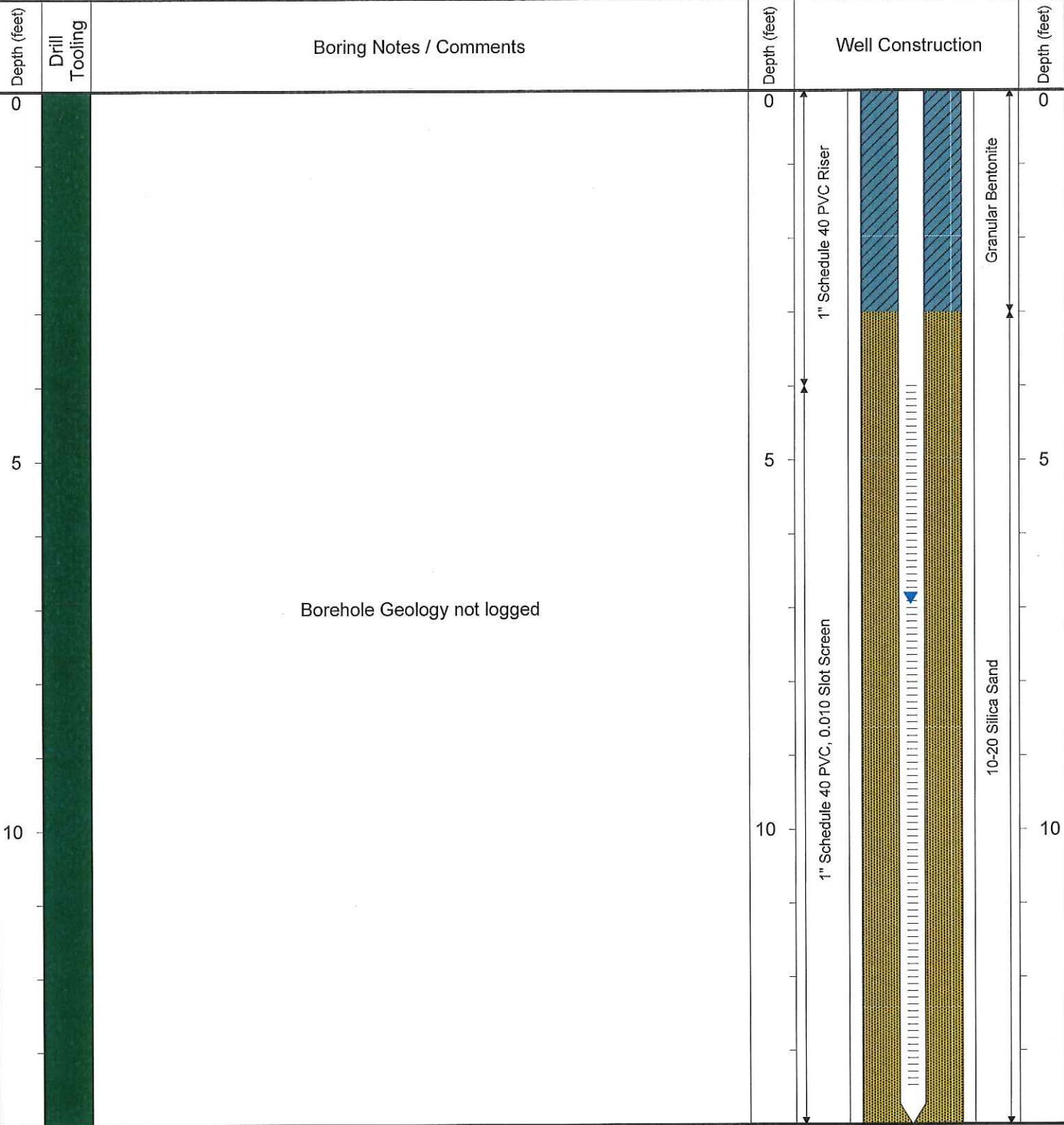
- Solid-Stem Auger
- Direct Push - Expendable Well Tip
- Perforated Injection Tool



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
DRILLED BY: Brandon LeVasseur
PROJECT MANAGER: Robert Cornez
DRILLING CONTRACTOR: Tasman Geosciences
DRILLING EQUIPMENT: AMS Powerprobe
DRILL BIT SIZE (INCHES): 2 3/8"
DATE STARTED - COMPLETED: 6/15/2015
TOTAL WELL DEPTH (FT. BGS): 14
DEPTH TO WATER (FT. BGS): 6.87 (11/05/15) ▼

Wirkner-Vance 3C-36HZ
BORING / WELL ID: BH05
SURFACE COMPLETION: Flush Mount
LATITUDE (UTM - NAD 83): 40.196913
LONGITUDE (UTM - NAD 83): -104.845467
CASING ELEVATION (FT. AMSL): 4828.72
GROUND ELEVATION (FT. AMSL): 4829.1



Drilling / Sample Method:

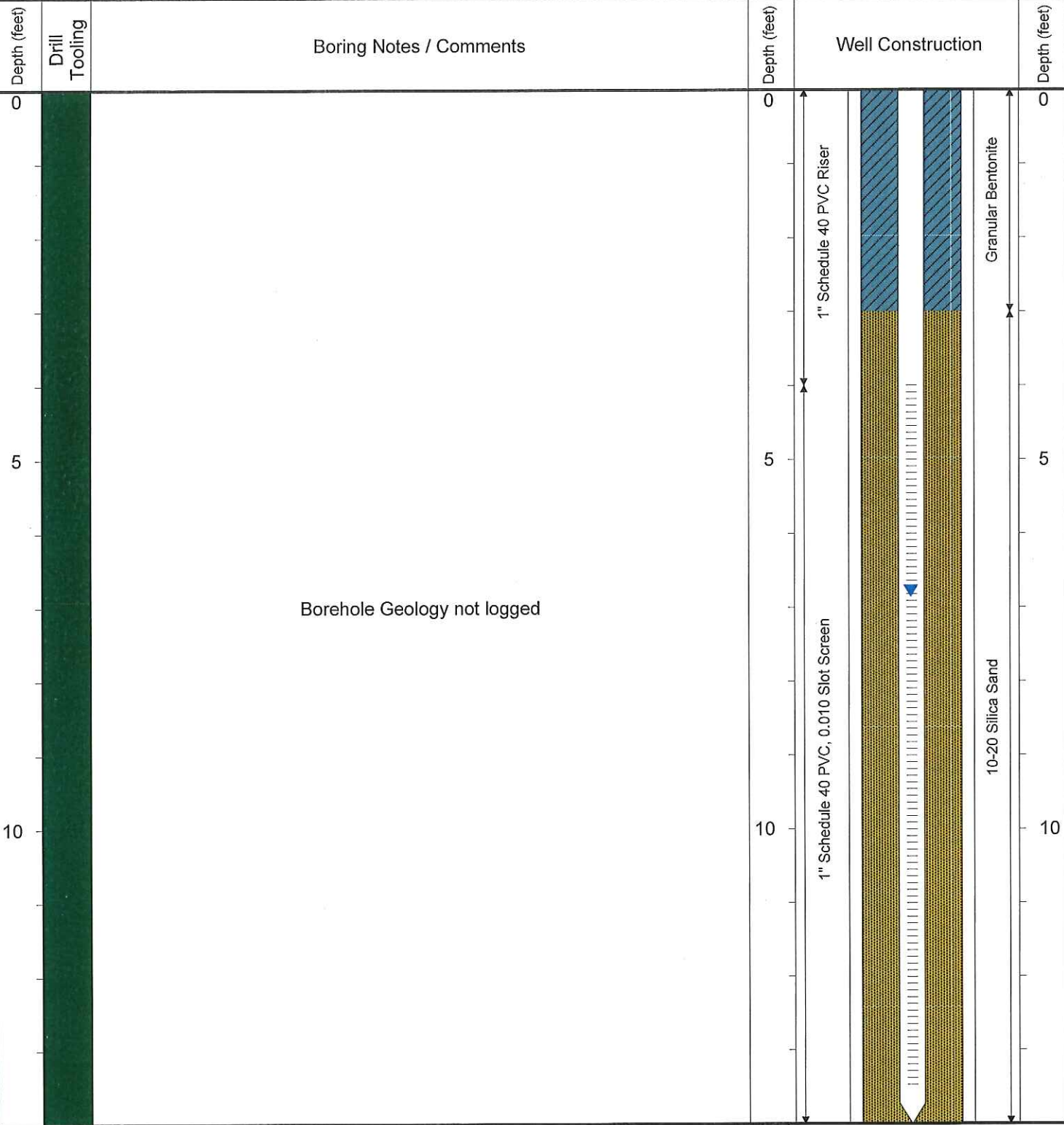
- Solid-Stem Auger
- Direct Push - Expendable Well Tip
- Perforated Injection Tool



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Kerr-McGee Oil and Gas Onshore, LP
 DRILLED BY: Brandon LeVasseur
 PROJECT MANAGER: Robert Cornez
 DRILLING CONTRACTOR: Tasman Geosciences
 DRILLING EQUIPMENT: AMS Powerprobe
 DRILL BIT SIZE (INCHES): 2 3/8"
 DATE STARTED - COMPLETED: 6/15/2015
 TOTAL WELL DEPTH (FT. BGS): 14
 DEPTH TO WATER (FT. BGS): 6.78 (11/05/15)

Wirkner-Vance 3C-36HZ
 BORING / WELL ID: BH06
 SURFACE COMPLETION: Flush Mount
 LATITUDE (UTM - NAD 83): 40.176795
 LONGITUDE (UTM - NAD 83): -104.845662
 CASING ELEVATION (FT. AMSL): 4828.69
 GROUND ELEVATION (FT. AMSL): 4828.8



Drilling / Sample Method:

- Solid-Stem Auger
- Perforated Injection Tool
- Direct Push - Expendable Well Tip