

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

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

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe): _____

GENERAL INFORMATION

OGCC Operator Number: 47121		Contact Name and Telephone	
Name of Operator: Kerr-McGee Gathering LLC		Name: Erik Mickelson	
Address: P.O. Box 173779		No: 720-929-4306	
City: Denver State: CO Zip: 80202		Fax: _____	
API/Facility No: _____		County: Arapahoe	
Facility Name: Pipeline 38-0000-5854-4"		Facility Number: _____	
Well Name: _____		Well Number: _____	
Location (QtrQtr, Sec, Twp, Rng, Meridian): SESE S11 T4S R63W		Latitude: 39.709735 Longitude: -104.396589	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): <u>Condensate</u>	
Site Conditions: Is location within a sensitive area (according to Rule 901e)? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation.	
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): <u>Non-Crop Land</u>	
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: <u>Clayey Sand</u>	
Potential receptors (water wells within 1/4 mi, surface waters, etc.): <u>There are no potential receptors within 1/4 mile of the site.</u>	
Description of Impact (if previously provided, refer to that form or document):	
Impacted Media (check):	Extent of Impact:
<input checked="" type="checkbox"/> Soils	22' (E-W) x 37' (N-S) x 23' bgs
<input type="checkbox"/> Vegetation	_____
<input type="checkbox"/> Groundwater	_____
<input type="checkbox"/> Surface water	_____
How Determined: <u>Excavation, drilling, soil sampling, and laboratory analysis</u>	

REMEDATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document): On September 23, 2015, a release due to internal corrosion of the pipeline was discovered at the 38-0000-5854-4" Pipeline. The pipeline was isolated, blown down, and excavation activities commenced. An Initial/Supplemental Form 19 was submitted to the COGCC on September 30, 2015, under COGCC Document No.400908441. The COGCC has issued Spill Tracking number 443445 for this release.
Describe how source is to be removed: On September 23, 2015, excavation activities commenced and approximately 140 cubic yards of impacted material were removed and transported to the Tower Landfill in Commerce City, Colorado for disposal. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls and base of the final extent of the excavation area at approximately 19 and 20 feet below ground surface (bgs), respectively. Soil samples were submitted to Origins Laboratory in Denver, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260, TPH - diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015. Laboratory results indicated that constituent concentrations in the soil samples collected from the final extent of the excavation area were below the applicable COGCC Table 910-1 standards at all locations except BH02@20, which exceeded the COGCC Table 910-1 standards for benzene and TPH. Soil analytical results are summarized in Table 1. Soil sample locations are illustrated in Figure 1 and laboratory analytical reports are included as Attachment A.
Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.: Impacted soil was excavated and transported to the Tower Landfill in Commerce City, Colorado for disposal. Additional assessment and proposed soil remediation measures are described on the following page.

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



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

REMEDIATION WORKPLAN (CONT.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Groundwater was not encountered during the excavation or soil boring 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.
The excavation has been backfilled with clean soil and graded to match the adjacent topography. 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? ☐ Y ☒ N If yes, describe:
On November 30, 2015, five soil borings were advanced in order to delineate the vertical and lateral extent of soil impacts confirmed in excavation soil sample B02@20. Soil samples were collected from various depths and submitted to Origins Laboratory in Denver, Colorado for analysis of BTEX and TPH-GRO by USEPA Method 8260, TPH-DRO and TPH-ORO by USEPA Method 8015. Laboratory results indicated that constituent concentrations in the soil samples collected from the soil borings were below the applicable COGCC Table 910-1 standards. Vertical profiling and lateral assessment data indicate that soil impacts extend from approximately 20 to 23 feet bgs in the immediate vicinity of excavation soil sample B02@20. Soil analytical results are summarized in Table 1 and soil boring and sample locations are illustrated in Figure 1. The laboratory analytical reports and boring logs are included as Attachments A and B, respectively. Remaining soil impacts will be addressed through the application of insitu remediation technology. Following treatment of the remaining soil impacts, confirmation soil samples will be collected to verify the success of the remedial application.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):
Impacted soil was transported to the Tower Landfill in Commerce City, Colorado.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 9/23/2015	Date Site Investigation Completed: 11/30/2015	Remediation Plan Submitted: _____
Remediation Start Date: 9/23/2015	Anticipated Completion Date: 5/30/2017	Actual Completion Date: _____

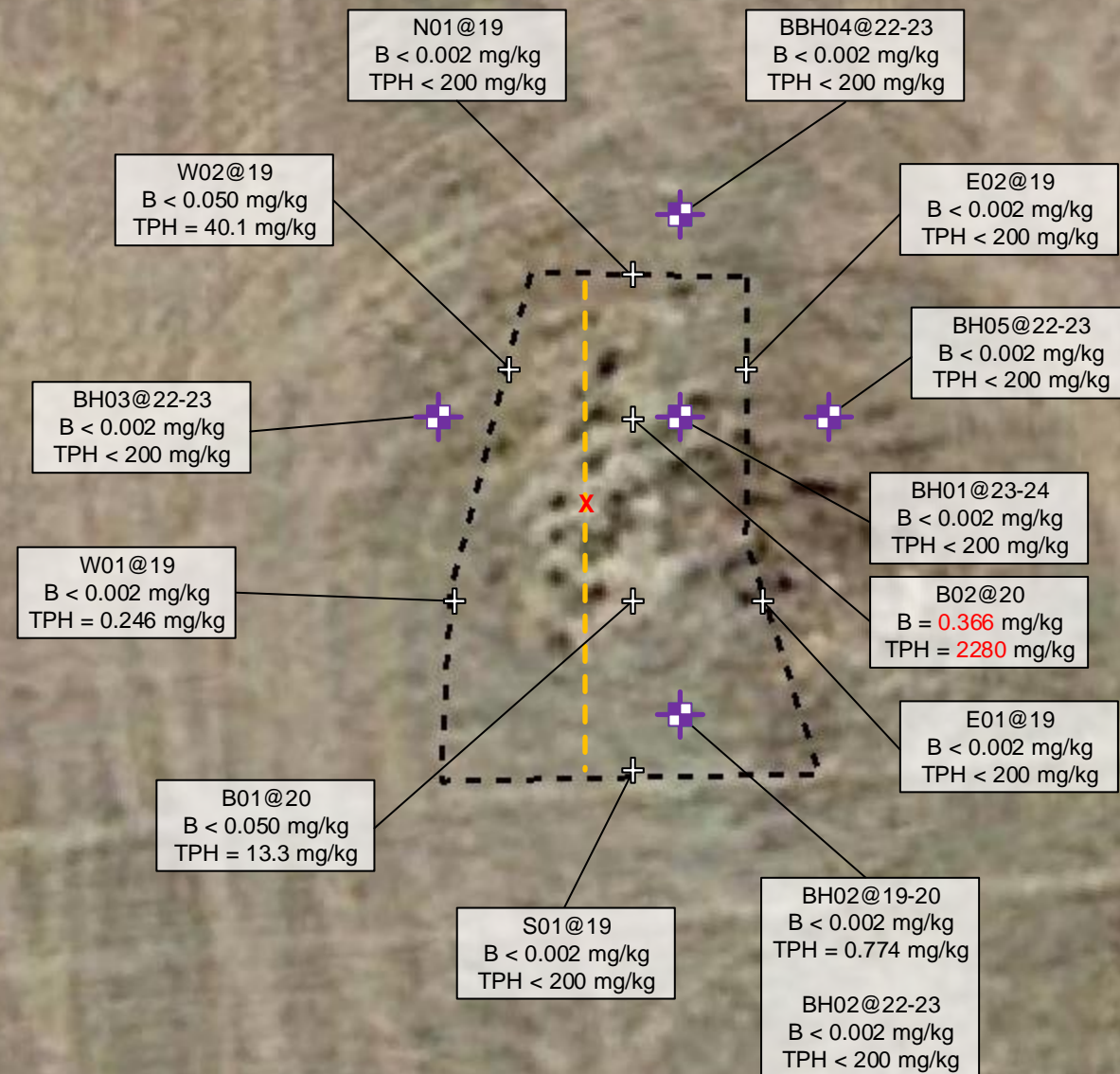
I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Erik Mickelson

Signed:  Title: Senior HSE Representative Date: 1/18/16

OGCC Approved: _____ Title: _____ Date: _____

FIGURE



Legend

- Excavation Extent (Collected via Trimble GPS)
- Area of Release
- Soil Sample Location
- Soil Boring Location
- Pipeline 38-0000-5854-4"

Notes

All Locations are Approximate Unless Otherwise Noted.

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

0 ft. 15 ft. 30 ft.

Image Source: Google Earth 2015

TABLE

TABLE 1
PIPELINE 38-0000-5854-4"
SOIL SAMPLE RESULTS SUMMARY TABLE
KERR-McGEE GATHERING, LLC

Sample ID	Date	Depth (ft. bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH-GRO (mg/kg)	TEPH-DRO (mg/kg)	TEPH-ORO (mg/kg)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500		
B01@20	09/23/15	20	<0.050	<0.050	<0.050	0.116	13.3	<50	<200
B02@20	09/25/15	20	0.366	3.29	6.84	69.8	1820	460	<200
N01@19	09/25/15	19	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
W01@19	09/25/15	19	<0.002	<0.002	<0.002	<0.002	0.246	<50	<200
W02@19	09/25/15	19	<0.050	<0.050	<0.050	0.066	40.1	<50	<200
E01@19	09/25/15	19	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
E02@19	09/25/15	19	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
S01@19	09/25/15	19	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
BH01@23-24	11/30/15	23-24	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
BH02@19-20	11/09/15	19-20	<0.002	<0.002	0.003	0.018	0.774	<50	<200
BH02@22-23	11/30/15	22-23	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
BH03@22-23	11/30/15	22-23	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
BH04@22-23	11/30/15	22-23	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200
BH05@22-23	11/30/15	22-23	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200

Notes:

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

COGCC = Colorado Oil and Gas Conservation Commission

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

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

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

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

mg/kg = Milligrams per kilogram.

ft. bgs = Feet below ground surface.

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

ATTACHMENT A
LABORATORY ANALYTICAL DATA



September 24, 2015

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - 5854-4" Maintenance

Project Number - 88855826

Attached are your analytical results for KMG - 5854-4" Maintenance received by Origins Laboratory, Inc. September 23, 2015. This project is associated with Origins project number X509316-01.

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: 88855826

Project: KMG - 5854-4" Maintenance

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 20'	X509316-01	Soil	September 23, 2015 16:27	09/23/2015 18:02

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

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

ORIGINS

LABORATORY, INC

XS09310

www.originslaboratory.com

Tasman on behalf of

Client: *Procter & Gamble*

Address: *6899 Pecos St*

Denver CO 80525

Telephone Number: *303-409-8791*

Email Address: *Christina@tasman-geo.com*
rcorner@tasman-geo.com

Project Manager:

Christine Wasko

Project Name:

5854-4" Maintenance

Project Number:

8885826

Samples Collected By:

Eve Fugarin

page of

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summary	Other			
B01 @ 20'	9/23/15	1627	1						X			GC/MS GC/MS	1	
													2	
													3	
													4	
													5	
													6	
													7	
													8	
													9	
													10	
Relinquished By: <i>Joe Curren</i>	Date: <i>9/23/15</i>	Time: <i>1802</i>		Received By: <i>[Signature]</i>	Date: <i>7.23.15</i>	Time: <i>1802</i>								
Relinquished By:	Date:	Time:		Received By:	Date:	Time:								

Turnaround Time: Same Day ☒ 24 Hr ☐
48 Hr ☐ 72 Hr ☐
Standard ☐

Temp Received: 74

Date Results Needed

Origins Laboratory, Inc.

Jose Pellegrini

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: **X509316**

Client: **Tasman**

Client Project ID: **5854-4" Maintenance**

Checklist Completed by: **gpc**

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

Date/time completed: **9/23/15 @ 2003**

Airbill #: _____

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

Cooler Number/Temperature: _____ / **7.4** °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"/>		client had sampled two hours prior
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 NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
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.

Samir Dab
Reviewed by (Project Manager)

9/23/15
Date/Time Reviewed

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

B01 @ 20'
9/23/2015 4:27:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509316-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5123008	09/23/2015	09/23/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	79.2 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	13.3	5.00	mg/kg	25	5123007	09/23/2015	09/24/2015
Benzene	ND	0.050	"	"	"	"	"
Toluene	ND	0.050	"	"	"	"	"
Ethylbenzene	ND	0.050	"	"	"	"	"
Xylenes, total	0.116	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	96.5 %	70-130			"	"	"
Surrogate: Toluene-d8	95.3 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"	"

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

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 5123007 - EPA 5030 (soil)

Blank (5123007-BLK1)

Prepared: 09/23/2015 Analyzed: 09/23/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	64.5		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	59.8		"	62.5		95.6	70-130			
Surrogate: 4-Bromofluorobenzene	60.7		"	62.5		97.1	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

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 5123007 - EPA 5030 (soil)										
LCS (5123007-BS1)					Prepared: 09/23/2015 Analyzed: 09/23/2015					
Benzene	0.098	0.002	mg/kg	0.100		97.8	77.1-124			
Toluene	0.097	0.002	"	0.100		96.7	74.5-128			
Ethylbenzene	0.108	0.002	"	0.100		108	66.4-127			
m,p-Xylene	0.210	0.004	"	0.200		105	76.6-124			
o-Xylene	0.108	0.002	"	0.100		108	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	64.5		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	60.2		"	62.5		96.4	70-130			
Surrogate: 4-Bromofluorobenzene	63.6		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

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 5123007 - EPA 5030 (soil)

Matrix Spike (5123007-MS1)		Source: X509303-01			Prepared: 09/23/2015 Analyzed: 09/23/2015					
Benzene	0.109	0.002	mg/kg	0.100	ND	109	71.8-126			
Toluene	0.108	0.002	"	0.100	ND	108	65.1-130			
Ethylbenzene	0.113	0.002	"	0.100	ND	113	62.2-130			
m,p-Xylene	0.230	0.004	"	0.200	ND	115	46.5-137			
o-Xylene	0.115	0.002	"	0.100	ND	115	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.6		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	61.2		"	62.5		97.9	70-130			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

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 5123007 - EPA 5030 (soil)

Matrix Spike Dup (5123007-MSD1)		Source: X509303-01			Prepared: 09/23/2015 Analyzed: 09/23/2015					
Benzene	0.106	0.002	mg/kg	0.100	ND	106	71.8-126	2.67	11.3	
Toluene	0.103	0.002	"	0.100	ND	103	65.1-130	4.28	15.4	
Ethylbenzene	0.106	0.002	"	0.100	ND	106	62.2-130	6.83	19.6	
m,p-Xylene	0.215	0.004	"	0.200	ND	107	46.5-137	6.77	19.2	
o-Xylene	0.109	0.002	"	0.100	ND	109	54.2-134	5.13	17.9	
Surrogate: 1,2-Dichloroethane-d4	68.2		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	60.4		"	62.5		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	65.3		"	62.5		105	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: 88855826
Project: KMG - 5854-4" Maintenance

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5123008 - EPA 3580

Blank (5123008-BLK1)

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	48		"	50.0		96.7	59-131			

LCS (5123008-BS1)

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	900	50	mg/kg	1000		90.1	64-121			
Residual Range Organics (C28-C36)	990	200	"	1000		99.0	58-124			
Surrogate: o-Terphenyl	52		"	50.0		103	59-131			

Matrix Spike (5123008-MS1)

Source: X509303-01

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	1000	50	mg/kg	1000	130	88.9	53-125			
Residual Range Organics (C28-C36)	790	200	"	1000	70	72.0	47-133			
Surrogate: o-Terphenyl	46		"	50.0		91.2	59-131			

Matrix Spike Dup (5123008-MSD1)

Source: X509303-01

Prepared: 09/23/2015 Analyzed: 09/23/2015

Diesel (C10-C28)	1000	50	mg/kg	1000	130	91.7	53-125	2.72	20	
Residual Range Organics (C28-C36)	950	200	"	1000	70	87.7	47-133	18.0	20	
Surrogate: o-Terphenyl	49		"	50.0		97.3	59-131			

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: 88855826

Project: KMG - 5854-4" Maintenance

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.



September 27, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Pipeline 5854-4"

Project Number - [none]

Attached are your analytical results for KMG - Pipeline 5854-4" received by Origins Laboratory, Inc. September 25, 2015. This project is associated with Origins project number X509342-01.

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: KMG - Pipeline 5854-4"

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B02 @ 20	X509342-01	Soil	September 25, 2015 9:20	09/25/2015 16:30
N01 @ 19	X509342-02	Soil	September 25, 2015 9:22	09/25/2015 16:30
W01 @ 19	X509342-03	Soil	September 25, 2015 9:24	09/25/2015 16:30
W02 @ 19	X509342-04	Soil	September 25, 2015 9:26	09/25/2015 16:30
E01 @ 19	X509342-05	Soil	September 25, 2015 9:28	09/25/2015 16:30
E02 @ 19	X509342-06	Soil	September 25, 2015 9:30	09/25/2015 16:30
S01 @ 19	X509342-07	Soil	September 25, 2015 9:32	09/25/2015 16:30

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: KMG - Pipeline 5854-4"

www.originslaboratory.com

page 1 of 1

X509342

ORIGINS
LABORATORY, INC

Client: Ape Industries/Tasman
Address:
Project Manager: C Wasko
Project Name: Pipeline 5854-4"
Project Number:
Samples Collected By: EWist Dillon-Herzog
Telephone Number: 312 694 5394
Email Address: c.wasko@tasman-geo.com

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	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #		
B02 @ 20	9/25/15	920	1	X					X		BTEX 8240 4-KO 8240 ORO/DRO 8015	1
N01 @ 19		922										2
W01 @ 19		924										3
W02 @ 19		926										4
E01 @ 19		928										5
E02 @ 19		930										6
S01 @ 19		932										7
												8
												9
												10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
<u>[Signature]</u>	9/25/15	13:00	<u>[Signature]</u>	9.25.15	1630	Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/>
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	

Date Results Needed

Origins Laboratory, Inc.

[Signature]

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: KMG - Pipeline 5854-4"

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X5093412

Client: Tasman

Client Project ID: Pipeline 5854-4"

Checklist Completed by: Jess Smith

Shipped Via: Pickup

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

Date/time completed: 9/25/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 4.1 °C 1 / _____ °C 1 / _____ °C 1 / _____ °C

Thermometer ID: REGD

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"/>			
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 NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
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.

Jess Smith
Reviewed by (Project Manager)

9/25/15
Date/Time Reviewed

Origins Laboratory, Inc.

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

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Pipeline 5854-4"

B02 @ 20
9/25/2015 9:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	460	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	91.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	1820	50.0	mg/kg	250	5125013	09/25/2015	09/25/2015
Benzene	0.366	0.050	"	25	"	"	09/25/2015
Toluene	3.29	0.050	"	"	"	"	"
Ethylbenzene	6.84	0.050	"	"	"	"	"
Xylenes, total	69.8	0.498	"	250	"	"	09/25/2015

<i>Surrogate: 1,2-Dichloroethane-d4</i>	102 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	103 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	109 %	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: KMG - Pipeline 5854-4"

N01 @ 19
9/25/2015 9:22:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	69.7 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	108 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	96.9 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	100 %	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: KMG - Pipeline 5854-4"

W01 @ 19
9/25/2015 9:24:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	74.7 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	0.246	0.200	mg/kg	1	5125013	09/25/2015	09/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	108 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	97.1 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %	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: KMG - Pipeline 5854-4"

W02 @ 19
9/25/2015 9:26:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	81.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	40.1	5.00	mg/kg	25	5125013	09/25/2015	09/25/2015
Benzene	ND	0.050	"	"	"	"	"
Toluene	ND	0.050	"	"	"	"	"
Ethylbenzene	ND	0.050	"	"	"	"	"
Xylenes, total	0.066	0.050	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	99.1 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	97.6 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	98.5 %	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: KMG - Pipeline 5854-4"

E01 @ 19
9/25/2015 9:28:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 64.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 111 % 70-130 " " "
Surrogate: Toluene-d8 98.8 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 103 % 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: KMG - Pipeline 5854-4"

E02 @ 19
9/25/2015 9:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-06 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	63.5 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	98.5 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Pipeline 5854-4"

S01 @ 19
9/25/2015 9:32:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509342-07 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5125012	09/25/2015	09/25/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 75.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5125013	09/25/2015	09/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 107 % 70-130 " " "

Surrogate: Toluene-d8 95.1 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 101 % 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: KMG - Pipeline 5854-4"

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 5125013 - EPA 5030 (soil)

Blank (5125013-BLK1)

Prepared: 09/25/2015 Analyzed: 09/25/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	66.2		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	58.6		"	62.5		93.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.7		"	62.5		102	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.

Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Pipeline 5854-4"

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 5125013 - EPA 5030 (soil)										
LCS (5125013-BS1)					Prepared: 09/25/2015 Analyzed: 09/25/2015					
Benzene	0.097	0.002	mg/kg	0.100		96.6	77.1-124			
Toluene	0.097	0.002	"	0.100		96.6	74.5-128			
Ethylbenzene	0.104	0.002	"	0.100		104	66.4-127			
m,p-Xylene	0.208	0.004	"	0.200		104	76.6-124			
o-Xylene	0.106	0.002	"	0.100		106	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	65.5		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	59.0		"	62.5		94.4	70-130			
Surrogate: 4-Bromofluorobenzene	62.7		"	62.5		100	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: KMG - Pipeline 5854-4"

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 5125013 - EPA 5030 (soil)

Matrix Spike (5125013-MS1)		Source: X509328-01			Prepared: 09/25/2015 Analyzed: 09/25/2015					
Benzene	0.100	0.002	mg/kg	0.100	ND	100	71.8-126			
Toluene	0.100	0.002	"	0.100	ND	99.7	65.1-130			
Ethylbenzene	0.109	0.002	"	0.100	ND	109	62.2-130			
m,p-Xylene	0.214	0.004	"	0.200	ND	107	46.5-137			
o-Xylene	0.108	0.002	"	0.100	ND	108	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.1		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	60.2		"	62.5		96.3	70-130			
Surrogate: 4-Bromofluorobenzene	63.4		"	62.5		101	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.

Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Pipeline 5854-4"

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 5125013 - EPA 5030 (soil)

Matrix Spike Dup (5125013-MSD1)		Source: X509328-01			Prepared: 09/25/2015 Analyzed: 09/25/2015					
Benzene	0.100	0.002	mg/kg	0.100	ND	99.8	71.8-126	0.679	11.3	
Toluene	0.098	0.002	"	0.100	ND	98.4	65.1-130	1.27	15.4	
Ethylbenzene	0.110	0.002	"	0.100	ND	110	62.2-130	0.110	19.6	
m,p-Xylene	0.216	0.004	"	0.200	ND	108	46.5-137	0.817	19.2	
o-Xylene	0.108	0.002	"	0.100	ND	108	54.2-134	0.704	17.9	
Surrogate: 1,2-Dichloroethane-d4	66.6		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	58.2		"	62.5		93.1	70-130			
Surrogate: 4-Bromofluorobenzene	62.9		"	62.5		101	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.

Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Pipeline 5854-4"

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

Origins Laboratory, Inc.

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

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5125012 - EPA 3580

Blank (5125012-BLK1)

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28) ND 50 mg/kg

Residual Range Organics (C28-C36) ND 200 "

Surrogate: o-Terphenyl 38 " 50.0 75.9 59-131

LCS (5125012-BS1)

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28) 830 50 mg/kg 1000 83.3 64-121

Residual Range Organics (C28-C36) 950 200 " 1000 94.8 58-124

Surrogate: o-Terphenyl 47 " 50.0 93.2 59-131

Matrix Spike (5125012-MS1)

Source: X509328-01

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28) 870 50 mg/kg 1000 ND 87.2 53-125

Residual Range Organics (C28-C36) 950 200 " 1000 16 93.1 47-133

Surrogate: o-Terphenyl 44 " 50.0 88.9 59-131

Matrix Spike Dup (5125012-MSD1)

Source: X509328-01

Prepared: 09/25/2015 Analyzed: 09/25/2015

Diesel (C10-C28) 860 50 mg/kg 1000 ND 85.6 53-125 1.91 20

Residual Range Organics (C28-C36) 920 200 " 1000 16 90.8 47-133 2.54 20

Surrogate: o-Terphenyl 44 " 50.0 88.7 59-131

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: KMG - Pipeline 5854-4"

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.

Noelle Doyle Mathis, President



November 17, 2015

Tasman Geosciences

Dan Wade

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Pipeline 38-0000-5854-4

Project Number - [none]

Attached are your analytical results for KMG - Pipeline 38-0000-5854-4 received by Origins Laboratory, Inc. November 10, 2015. This project is associated with Origins project number X511119-01.

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

Dan Wade

Project Number: [none]

Project: KMG - Pipeline 38-0000-5854-4

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH02 @ 19-20	X511119-01	Soil	November 9, 2015 15:50	11/10/2015 16:53

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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

ORIGINS

LABORATORY, INC

XS11119

www.originslaboratory.com

page 1 of 1

Fax: 303.265.9645

Client: Andarke/Tasman

Project Manager/Send Report To: DAN WADE

Address: 6899 Pecos St

Email Address: DWADE@Tasman-geo.com

Denver, CO 80221

Project Name/Number: Pipeline 38-000-8854-4

Telephone Number: 303-912-2025

Samples Collected By: Tyler Blessing

Phone: 303.433.1322

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis/Method	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #		
BH02@19-20												1
BH02@19-20	11/9/15	1550	1	X					X		8260 - ABTEX 8015 - DPO/ORO	2
												3
												4
												5
												6
												7
												8
												9
												10
Relinquished By: <u>[Signature]</u>	Date: <u>11.10.15</u>	Time: <u>1653</u>	Time: <u>1653</u>	Received By: <u>[Signature]</u>	Date: <u>11.10.15</u>	Time: <u>1653</u>	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard <input checked="" type="checkbox"/> 38					
Relinquished By: <u>[Signature]</u>	Date: <u>11.10.15</u>	Time: <u>1653</u>	Time: <u>1653</u>	Received By: <u>[Signature]</u>	Date: <u>11.10.15</u>	Time: <u>1653</u>						

Comments:

Date Rec'd: N/A

Origins Laboratory, Inc.

Jeff Pellgrini

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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS11119

Client: Tasman

Client Project ID: KMG-Pipeline

Checklist Completed by: Jeff Smith

Shipped Via: 4D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/11/15

Airbill #: N/A

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

Cooler Number/Temperature: 1 13.8 °C 1 °C 1 °C 1 °C (Describe)

Thermometer ID: TOCB

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"/>			
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 NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
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.

Jeff Smith
Reviewed by (Project Manager)

11/11/15
Date/Time Reviewed

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

BH02 @ 19-20
11/9/2015 3:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511119-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K1106	11/11/2015	11/12/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	91.5 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	0.774	0.200	mg/kg	1	B5K1105	11/11/2015	11/11/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	0.003	0.002	"	"	"	"	"
Xylenes, total	0.018	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"
Surrogate: Toluene-d8	102 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.4 %	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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

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 B5K1105 - EPA 5030 (soil)

Blank (B5K1105-BLK1)

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

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	65.0		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	63.9		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	61.8		"	62.5		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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

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 B5K1105 - EPA 5030 (soil)										
LCS (B5K1105-BS1)					Prepared: 11/11/2015 Analyzed: 11/11/2015					
Benzene	0.099	0.002	mg/kg	0.100		99.5	77.1-124			
Toluene	0.100	0.002	"	0.100		99.8	74.5-128			
Ethylbenzene	0.094	0.002	"	0.100		94.3	66.4-127			
m,p-Xylene	0.186	0.004	"	0.200		93.2	76.6-124			
o-Xylene	0.092	0.002	"	0.100		92.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	63.2		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	63.6		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	63.4		"	62.5		101	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

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 B5K1105 - EPA 5030 (soil)

Matrix Spike (B5K1105-MS1)		Source: X511119-01			Prepared: 11/11/2015 Analyzed: 11/11/2015					
Benzene	0.077	0.002	mg/kg	0.100	ND	77.2	71.8-126			
Toluene	0.077	0.002	"	0.100	ND	77.1	65.1-130			
Ethylbenzene	0.080	0.002	"	0.100	0.003	77.3	62.2-130			
m,p-Xylene	0.168	0.004	"	0.200	0.015	76.2	46.5-137			
o-Xylene	0.076	0.002	"	0.100	0.003	73.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	67.5		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	63.0		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	64.0		"	62.5		102	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

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 B5K1105 - EPA 5030 (soil)

Matrix Spike Dup (B5K1105-MSD1)		Source: X511119-01			Prepared: 11/11/2015 Analyzed: 11/11/2015					
Benzene	0.073	0.002	mg/kg	0.100	ND	73.3	71.8-126	5.18	11.3	
Toluene	0.070	0.002	"	0.100	ND	69.9	65.1-130	9.76	15.4	
Ethylbenzene	0.072	0.002	"	0.100	0.003	68.8	62.2-130	11.3	19.6	
m,p-Xylene	0.153	0.004	"	0.200	0.015	68.7	46.5-137	9.44	19.2	
o-Xylene	0.071	0.002	"	0.100	0.003	68.1	54.2-134	7.78	17.9	
Surrogate: 1,2-Dichloroethane-d4	71.3		ug/kg	62.5		114	70-130			
Surrogate: Toluene-d8	63.4		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	64.3		"	62.5		103	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4

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

Origins Laboratory, Inc.

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

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5K1106 - EPA 3580

Blank (B5K1106-BLK1)

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

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	47		"	50.0		94.0	59-131			

LCS (B5K1106-BS1)

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

Diesel (C10-C28)	790	50	mg/kg	1000		79.4	64-121			
Residual Range Organics (C28-C36)	790	200	"	1000		78.9	58-124			
Surrogate: o-Terphenyl	45		"	50.0		90.1	59-131			

Matrix Spike (B5K1106-MS1)

Source: X511119-01

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

Diesel (C10-C28)	930	50	mg/kg	1000	ND	92.6	53-125			
Residual Range Organics (C28-C36)	960	200	"	1000	15	94.9	47-133			
Surrogate: o-Terphenyl	48		"	50.0		95.2	59-131			

Matrix Spike Dup (B5K1106-MSD1)

Source: X511119-01

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

Diesel (C10-C28)	990	50	mg/kg	1000	ND	99.1	53-125	6.72	20	
Residual Range Organics (C28-C36)	1100	200	"	1000	15	105	47-133	9.60	20	
Surrogate: o-Terphenyl	56		"	50.0		111	59-131			

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

Dan Wade

Project Number: [none]

Project: KMG - Pipeline 38-0000-5854-4

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



December 04, 2015

Tasman Geosciences

Dan Wade

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Pipeline 38-0000-5854-4"

Project Number - [none]

Attached are your analytical results for KMG - Pipeline 38-0000-5854-4" received by Origins Laboratory, Inc. December 01, 2015. This project is associated with Origins project number X512020-01.

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

Dan Wade

Project Number: [none]

Project: KMG - Pipeline 38-0000-5854-4"

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01 @ 23-24'	X512020-01	Soil	November 30, 2015 10:45	12/01/2015 17:04
BH02 @ 22-23'	X512020-02	Soil	November 30, 2015 12:40	12/01/2015 17:04
BH03 @ 22-23'	X512020-03	Soil	November 30, 2015 14:00	12/01/2015 17:04
BH04 @ 22-23'	X512020-04	Soil	November 30, 2015 15:20	12/01/2015 17:04
BH05 @ 22-23'	X512020-05	Soil	November 30, 2015 16:25	12/01/2015 17:04

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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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

XSize

www.originslaboratory.com

page | of |

Client: Tasman / APC Midstream

Address: _____

Telephone Number: _____

Email Address: _____

Project Manager: Dan Wade

Project Name: Pipeline 38-000-5854-4"

Project Number: _____

Samples Collected By: Eric Siegel

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix			Analysis				Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #	Other	BTEX	GRO	DRO	CRO	
BH01 e 23-24'	11/30/15	10:45	1	X					X			X	X	X	X	1
BH02 e 22-23'		12:40	1													2
BH03 e 22-23'		14:00	1													3
BH04 e 22-23'		15:20	1													4
BH05 e 22-23'		16:25	1													5
																6
																7
																8
																9
																10
Relinquished By: <u>E. A. Siegel</u>	Date: <u>11/30/15</u>	Time: _____	Received By: <u>K. [Signature]</u>	Date: <u>12.01/15</u>	Time: <u>17:04</u>	Turnaround Time:		Same Day: <input type="checkbox"/>	24 Hr: <input type="checkbox"/>	48 Hr: <input type="checkbox"/>	72 Hr: <input checked="" type="checkbox"/>	Standard: <input checked="" type="checkbox"/>				
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____			Same Day: <input type="checkbox"/>	24 Hr: <input type="checkbox"/>	48 Hr: <input type="checkbox"/>	72 Hr: <input type="checkbox"/>					

Temp Received -

Date Results Needed

Origins Laboratory, Inc.

Jeff Pellipini

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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS2020

Client: Tasman

Client Project ID: Pipeline 38-0000-5854-4"

Checklist Completed by: Jefe Smith

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

Date/time completed: 12/2/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 4.2 °C / °C / °C / °C

Thermometer ID: TWS

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

Date/Time Reviewed: 12/2/15

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

BH01 @ 23-24'
11/30/2015 10:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512020-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5L0201	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	75.6 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0202	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	92.5 %	70-130			"	"	"
Surrogate: Toluene-d8	104 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	94.9 %	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

BH02 @ 22-23'
11/30/2015 12:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512020-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5L0201	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

<i>Surrogate: o-Terphenyl</i>	75.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0202	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

<i>Surrogate: 1,2-Dichloroethane-d4</i>	93.0 %	70-130			"	"	"
<i>Surrogate: Toluene-d8</i>	105 %	70-130			"	"	"
<i>Surrogate: 4-Bromofluorobenzene</i>	96.1 %	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

BH03 @ 22-23'

11/30/2015 2:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. X512020-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5L0201	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	70.2 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0202	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	94.2 %	70-130			"	"	"
Surrogate: Toluene-d8	105 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	95.8 %	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

BH04 @ 22-23'

11/30/2015 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. X512020-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5L0201	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	70.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0202	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.0 %	70-130			"	"	"
Surrogate: Toluene-d8	106 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.0 %	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

BH05 @ 22-23'

11/30/2015 4:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. X512020-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5L0201	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	77.3 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0202	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	92.0 %	70-130			"	"	"
Surrogate: Toluene-d8	104 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	91.4 %	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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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 B5L0202 - EPA 5030 (soil)

Blank (B5L0202-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	58.0		ug/kg	62.5		92.7	70-130			
Surrogate: Toluene-d8	64.9		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	60.0		"	62.5		96.0	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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 B5L0202 - EPA 5030 (soil)										
LCS (B5L0202-BS1)					Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.090	0.002	mg/kg	0.100		90.4	77.1-124			
Toluene	0.093	0.002	"	0.100		93.4	74.5-128			
Ethylbenzene	0.081	0.002	"	0.100		80.9	66.4-127			
m,p-Xylene	0.164	0.004	"	0.200		81.8	76.6-124			
o-Xylene	0.083	0.002	"	0.100		83.1	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	53.1		ug/kg	62.5		85.0	70-130			
Surrogate: Toluene-d8	63.0		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	59.8		"	62.5		95.6	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

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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 B5L0202 - EPA 5030 (soil)

Matrix Spike (B5L0202-MS1)		Source: X512020-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.106	0.002	mg/kg	0.100	ND	106	71.8-126			
Toluene	0.104	0.002	"	0.100	ND	104	65.1-130			
Ethylbenzene	0.091	0.002	"	0.100	ND	90.7	62.2-130			
m,p-Xylene	0.180	0.004	"	0.200	ND	89.8	46.5-137			
o-Xylene	0.090	0.002	"	0.100	ND	90.4	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	55.8		ug/kg	62.5		89.2	70-130			
Surrogate: Toluene-d8	64.4		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	59.3		"	62.5		94.9	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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 B5L0202 - EPA 5030 (soil)

Matrix Spike Dup (B5L0202-MSD1)		Source: X512020-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.108	0.002	mg/kg	0.100	ND	108	71.8-126	2.49	11.3	
Toluene	0.109	0.002	"	0.100	ND	109	65.1-130	4.19	15.4	
Ethylbenzene	0.095	0.002	"	0.100	ND	94.7	62.2-130	4.32	19.6	
m,p-Xylene	0.186	0.004	"	0.200	ND	92.8	46.5-137	3.25	19.2	
o-Xylene	0.096	0.002	"	0.100	ND	95.8	54.2-134	5.84	17.9	
Surrogate: 1,2-Dichloroethane-d4	56.8		ug/kg	62.5		90.9	70-130			
Surrogate: Toluene-d8	65.4		"	62.5		105	70-130			
Surrogate: 4-Bromofluorobenzene	60.9		"	62.5		97.4	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Dan Wade
Project Number: [none]
Project: KMG - Pipeline 38-0000-5854-4"

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

Origins Laboratory, Inc.

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

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0201 - EPA 3580

Blank (B5L0201-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	44		"	50.0		87.5	59-131			

LCS (B5L0201-BS1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	810	50	mg/kg	1000		80.9	64-121			
Residual Range Organics (C28-C36)	860	200	"	1000		86.0	58-124			
Surrogate: o-Terphenyl	45		"	50.0		89.4	59-131			

Matrix Spike (B5L0201-MS1)

Source: X512020-01

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	730	50	mg/kg	1000	ND	73.2	53-125			
Residual Range Organics (C28-C36)	760	200	"	1000	24	73.2	47-133			
Surrogate: o-Terphenyl	41		"	50.0		81.7	59-131			

Matrix Spike Dup (B5L0201-MSD1)

Source: X512020-01

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	840	50	mg/kg	1000	ND	84.2	53-125	14.0	20	
Residual Range Organics (C28-C36)	900	200	"	1000	24	88.0	47-133	17.9	20	
Surrogate: o-Terphenyl	43		"	50.0		85.9	59-131			

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

Dan Wade

Project Number: [none]

Project: KMG - Pipeline 38-0000-5854-4"

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
BORING LOGS



6899 Pecos Street, Unit C
Denver, Colorado 80221

917 1st Avenue North, Suite 3
Billings, Montana 59101

CLIENT: Kerr-McGee Gathering, LLC

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Dan Wade, P.G.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: CME 55

DRILL BIT SIZE (INCHES): 8.25"

DATE STARTED - COMPLETED: 11/30/2015

TOTAL BORING DEPTH (FT. BGS): 29

DEPTH TO WATER (FT. BGS): Not Encountered ▼

Pipeline 38-0000-5854-4"

BORING / WELL ID: BH-01

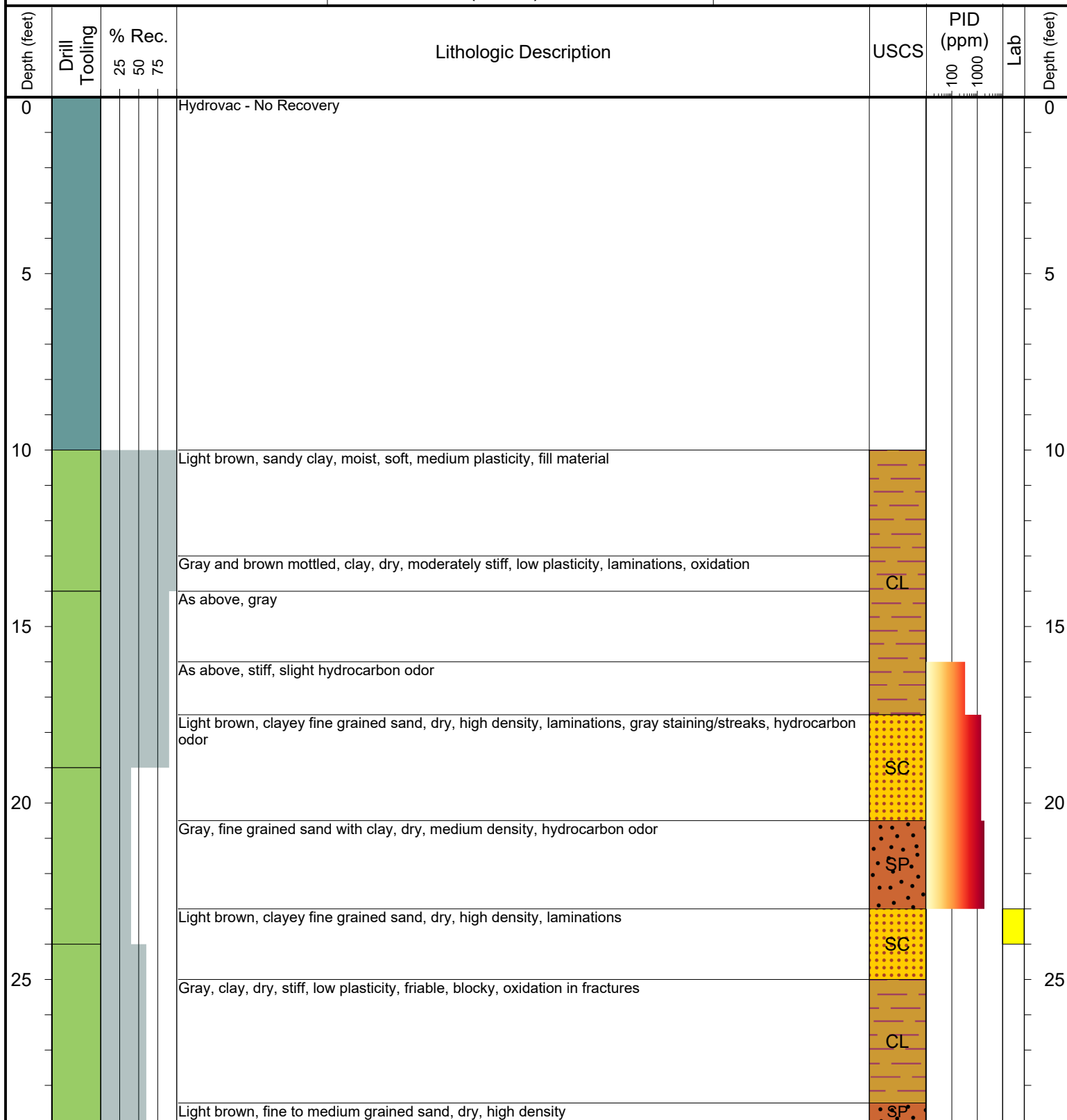
SURFACE COMPLETION: Native Soil

NORTHING (CO STATE PLANE): NS

EASTING (CO STATE PLANE): NS

GROUND ELEVATION (FT. AMSL): NS

ABANDONMENT METHOD: Bentonite Backfill



Drill Tooling / Sample Method:

■ Solid Stem Auger

■ Hollow Stem Auger

■ Split Spoon Sampler

■ CME Continuous Sample Tube

Laboratory Sample Types:

■ Geotechnical Lab

■ Analytical Chemistry Lab



Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

917 1st Avenue North, Suite 3
Billings, Montana 59101

CLIENT: Kerr-McGee Gathering, LLC

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Dan Wade, P.G.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: CME 55

DRILL BIT SIZE (INCHES): 8.25"

DATE STARTED - COMPLETED: 11/30/2015

TOTAL BORING DEPTH (FT. BGS): 24

DEPTH TO WATER (FT. BGS): Not Encountered ▼

Pipeline 38-0000-5854-4"

BORING / WELL ID: BH-02

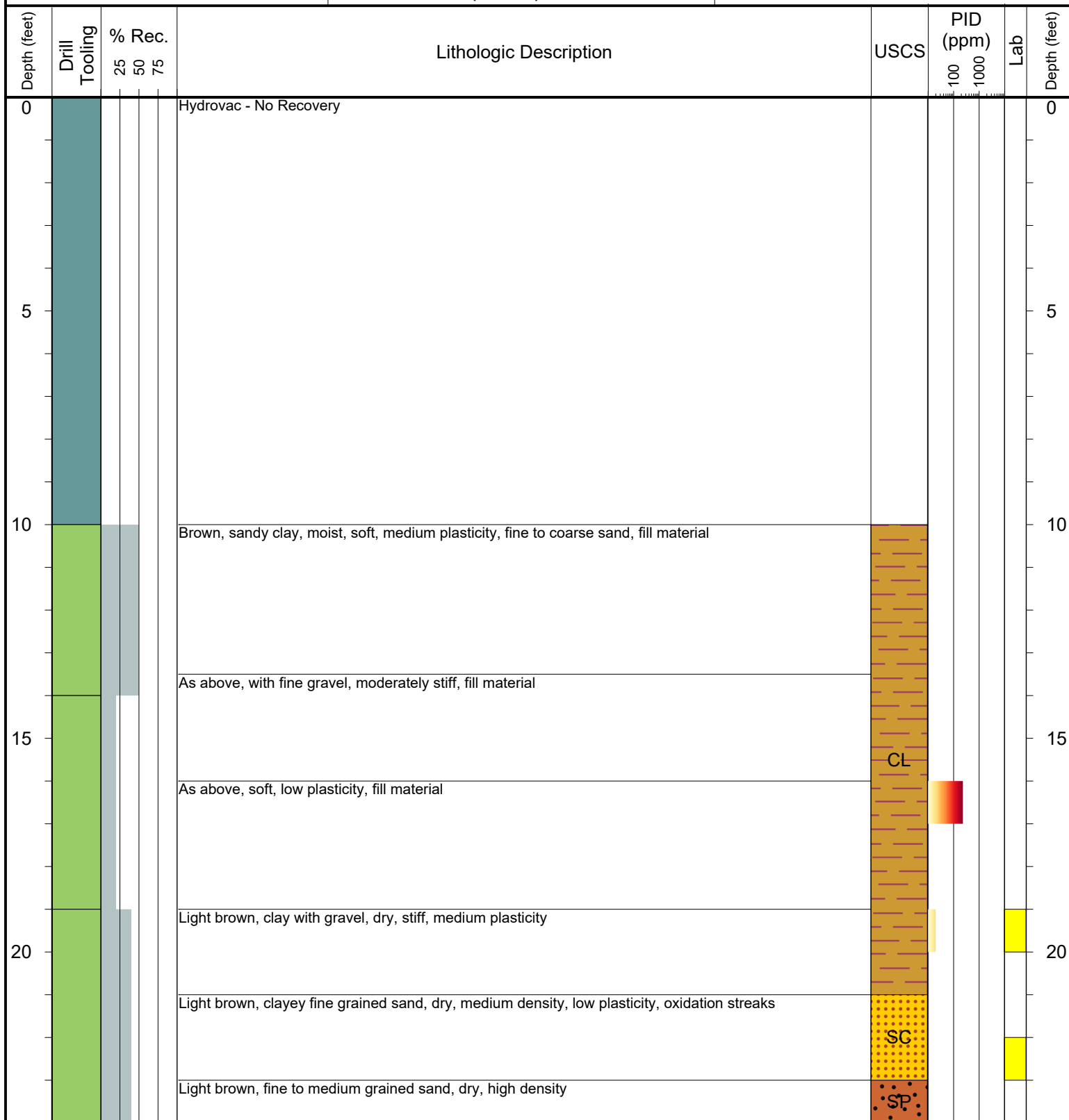
SURFACE COMPLETION: Native Soil

NORTHING (CO STATE PLANE): NS

EASTING (CO STATE PLANE): NS

GROUND ELEVATION (FT. AMSL): NS

ABANDONMENT METHOD: Bentonite Backfill



Drill Tooling / Sample Method:

■ Solid Stem Auger
■ Hollow Stem Auger

■ Split Spoon Sampler
■ CME Continuous Sample Tube

Laboratory Sample Types:

■ Geotechnical Lab
■ Analytical Chemistry Lab

■ Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

917 1st Avenue North, Suite 3
Billings, Montana 59101

CLIENT: Kerr-McGee Gathering, LLC

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Dan Wade, P.G.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: CME 55

DRILL BIT SIZE (INCHES): 8.25"

DATE STARTED - COMPLETED: 11/30/2015

TOTAL BORING DEPTH (FT. BGS): 24.5

DEPTH TO WATER (FT. BGS): Not Encountered ▼

Pipeline 38-0000-5854-4"

BORING / WELL ID: BH-03

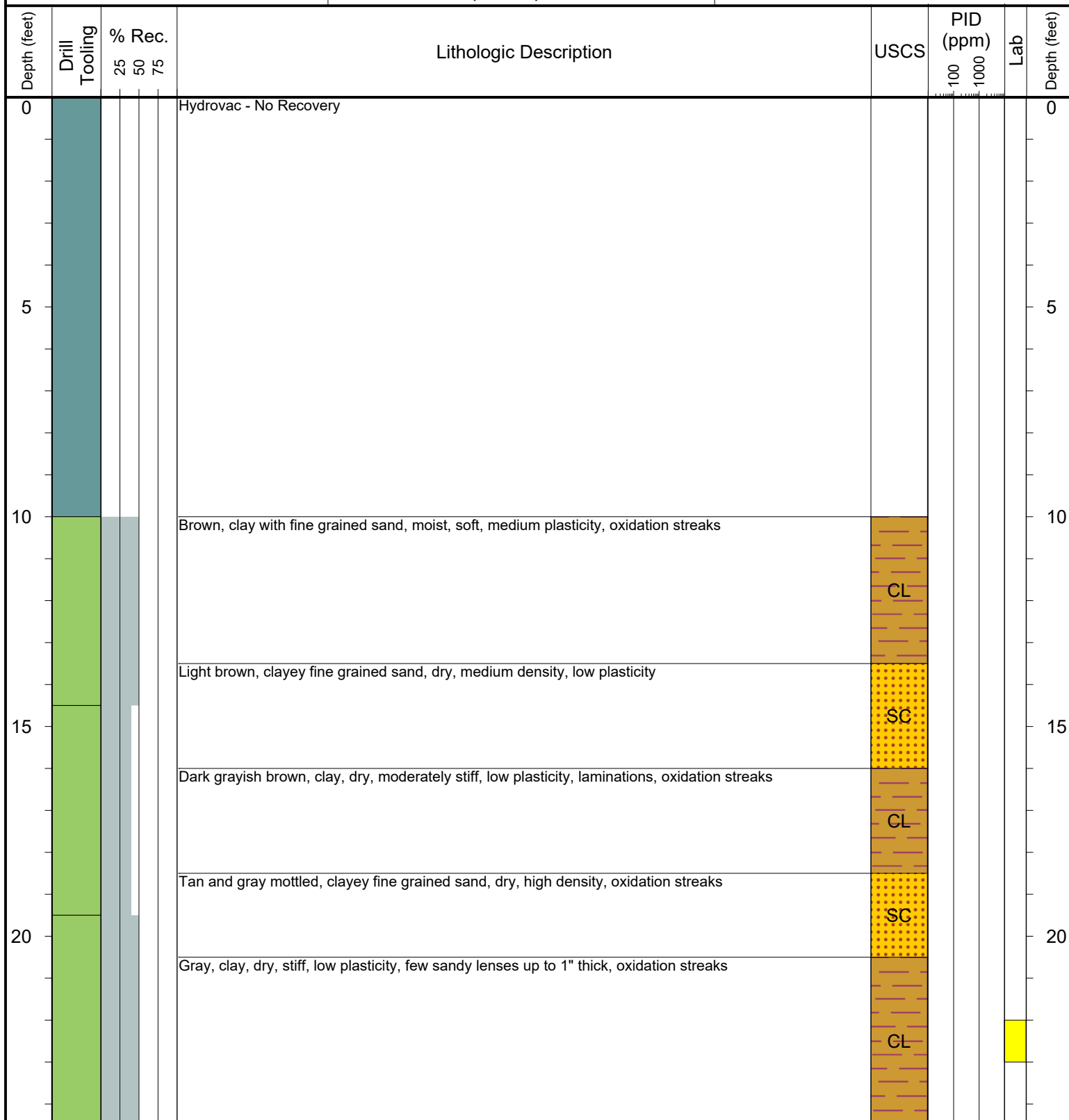
SURFACE COMPLETION: Native Soil

NORTHING (CO STATE PLANE): NS

EASTING (CO STATE PLANE): NS

GROUND ELEVATION (FT. AMSL): NS

ABANDONMENT METHOD: Bentonite Backfill



Drill Tooling / Sample Method:

Solid Stem Auger

Hollow Stem Auger

Split Spoon Sampler

CME Continuous Sample Tube

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

917 1st Avenue North, Suite 3
Billings, Montana 59101

CLIENT: Kerr-McGee Gathering, LLC

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Dan Wade, P.G.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: CME 55

DRILL BIT SIZE (INCHES): 8.25"

DATE STARTED - COMPLETED: 11/30/2015

TOTAL BORING DEPTH (FT. BGS): 24

DEPTH TO WATER (FT. BGS): Not Encountered ▼

Pipeline 38-0000-5854-4"

BORING / WELL ID: BH-04

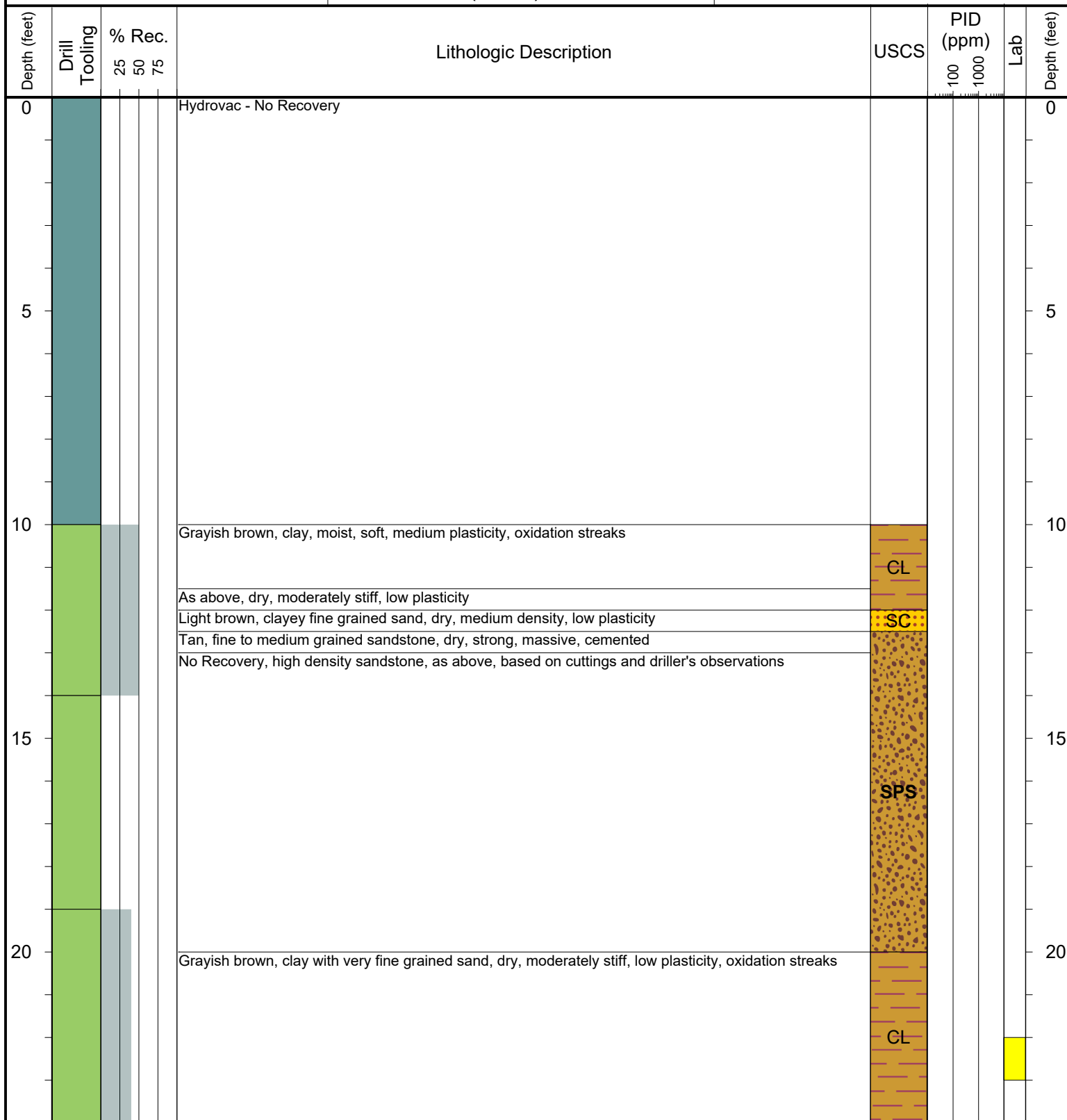
SURFACE COMPLETION: Native Soil

NORTHING (CO STATE PLANE): NS

EASTING (CO STATE PLANE): NS

GROUND ELEVATION (FT. AMSL): NS

ABANDONMENT METHOD: Bentonite Backfill



Drill Tooling / Sample Method:

■ Solid Stem Auger

■ Hollow Stem Auger

■ Split Spoon Sampler

■ CME Continuous Sample Tube

Laboratory Sample Types:

■ Geotechnical Lab

■ Analytical Chemistry Lab



Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

917 1st Avenue North, Suite 3
Billings, Montana 59101

CLIENT: Kerr-McGee Gathering, LLC

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Dan Wade, P.G.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: CME 55

DRILL BIT SIZE (INCHES): 8.25"

DATE STARTED - COMPLETED: 11/30/2015

TOTAL BORING DEPTH (FT. BGS): 24

DEPTH TO WATER (FT. BGS): Not Encountered ▼

Pipeline 38-0000-5854-4"

BORING / WELL ID: BH-05

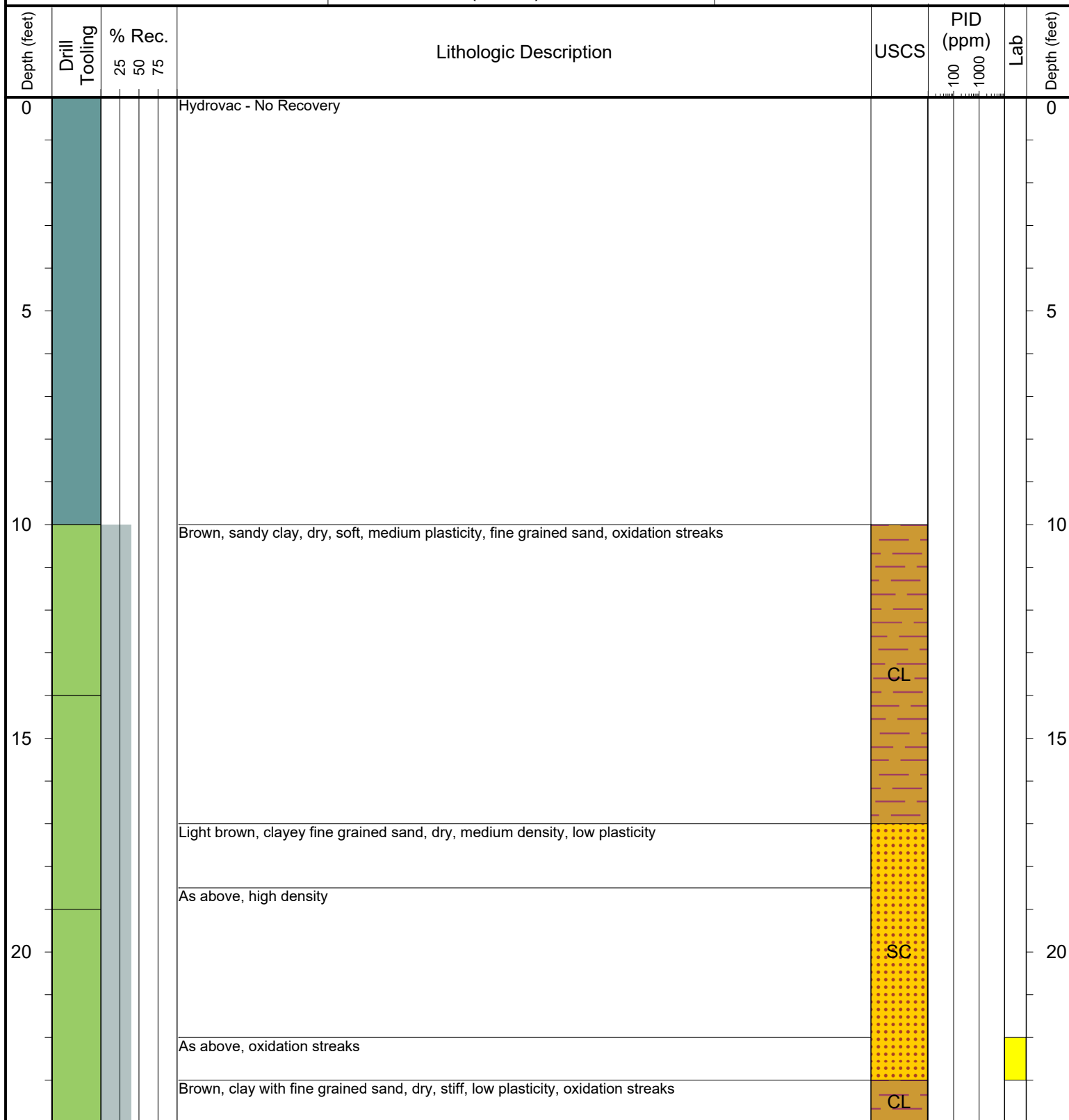
SURFACE COMPLETION: Native Soil

NORTHING (CO STATE PLANE): NS

EASTING (CO STATE PLANE): NS

GROUND ELEVATION (FT. AMSL): NS

ABANDONMENT METHOD: Bentonite Backfill



Drill Tooling / Sample Method:

■ Solid Stem Auger

■ Hollow Stem Auger

■ Split Spoon Sampler

■ CME Continuous Sample Tube

Laboratory Sample Types:

■ Geotechnical Lab

■ Analytical Chemistry Lab



Geotechnical & Analytical Chemistry Lab