

November 20, 2018

Olsson Associates

James Hix

1525 Raleigh St, Suite 400

Denver CO 80204

Project Name - GWOG - Colorado State #2

Project Number - 018-3312

Attached are your analytical results for GWOG - Colorado State #2 received by Origins Laboratory, Inc. November 16, 2018. This project is associated with Origins project number Y811249-01.

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



Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

James Hix
Project Number: 018-3312
Project: GWOG - Colorado State #2

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GP01@10-11ft	Y811249-01	Soil	November 15, 2018 10:05	11/16/2018 08:40
GP02@10-11ft	Y811249-02	Soil	November 15, 2018 12:50	11/16/2018 08:40
GP03@7.5ft	Y811249-03	Soil	November 15, 2018 13:10	11/16/2018 08:40
GP04@7.5-8.0ft	Y811249-04	Soil	November 15, 2018 13:38	11/16/2018 08:40
GP05@7.5ft	Y811249-05	Soil	November 15, 2018 13:49	11/16/2018 08:40
GP06@7.5ft	Y811249-06	Soil	November 15, 2018 14:10	11/16/2018 08:40
GP07@7.0ft	Y811249-07	Soil	November 15, 2018 14:35	11/16/2018 08:40
GP08@5.0-6.0ft	Y811249-08	Soil	November 15, 2018 15:00	11/16/2018 08:40
GP09@4.5-5.0ft	Y811249-09	Soil	November 15, 2018 15:30	11/16/2018 08:40

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
 1525 Raleigh St, Suite 400
 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: y811249 Client: Olsson
 Client Project ID: GWOG - Colorado State #2
 Checklist Completed by: JG Shipped Via: HD
 Date/time completed: 11/16/2018 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: N/A
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 Cooler Number/Temperature: 1 / 0.2 °c _____ / _____ °c _____ / _____ °c _____ / _____ °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⁾ ?	<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.

Reviewed by (Project Manager) JPH Date/Time Reviewed 11/19/18

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Olsson Associates
 1525 Raleigh St, Suite 400
 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP01@10-11ft
11/15/2018 10:05:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: o-Terphenyl 81.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 106 % 70-130 " " "
Surrogate: Toluene-d8 99.5 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 97.1 % 70-130 " " "

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Olsson Associates
 1525 Raleigh St, Suite 400
 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP02@10-11ft
11/15/2018 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 81.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 108 % 70-130 " " "
 Surrogate: Toluene-d8 98.8 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 97.1 % 70-130 " " "

Origins Laboratory, Inc.



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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP03@7.5ft

11/15/2018 1:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 86.3 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 108 % 70-130 " " "
 Surrogate: Toluene-d8 99.1 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 97.2 % 70-130 " " "

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James Hix
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 Project: GWOG - Colorado State #2

GP04@7.5-8.0ft
11/15/2018 1:38:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: o-Terphenyl 81.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 110 % 70-130 " " "

Surrogate: Toluene-d8 98.8 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 96.8 % 70-130 " " "

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James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP05@7.5ft

11/15/2018 1:49:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: o-Terphenyl 94.1 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/19/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 105 % 70-130 " " "
Surrogate: Toluene-d8 99.0 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 96.5 % 70-130 " " "

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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP06@7.5ft

11/15/2018 2:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-06 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 84.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/19/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 109 % 70-130 " " "
 Surrogate: Toluene-d8 98.5 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 96.3 % 70-130 " " "

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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP07@7.0ft
11/15/2018 2:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-07 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 82.3 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/19/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 112 % 70-130 " " "
 Surrogate: Toluene-d8 97.4 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 97.0 % 70-130 " " "

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 1525 Raleigh St, Suite 400
 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP08@5.0-6.0ft
11/15/2018 3:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-08 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 70.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 108 % 70-130 " " "
 Surrogate: Toluene-d8 98.4 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 96.9 % 70-130 " " "

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 1525 Raleigh St, Suite 400
 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

GP09@4.5-5.0ft
11/15/2018 3:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y811249-09 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8K1603	JTD	11/16/2018	11/16/2018	U
Residual Range Organics (C28-C40)	ND	200	"	"	"	JTD	"	"	U

Surrogate: *o*-Terphenyl 73.3 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8K1602	JTD	11/16/2018	11/16/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4 108 % 70-130 " " "
 Surrogate: Toluene-d8 98.4 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 96.7 % 70-130 " " "

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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Blank (B8K1602-BLK1)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		105	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.0	70-130			

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Jen Pellegrini, Project Manager

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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Blank (B8K1602-BLK2)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		97.1	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Blank (B8K1602-BLK3)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.4	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

LCS (B8K1602-BS1)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Benzene	0.105	0.002	mg/kg	0.100		105	77.1-124			
Toluene	0.102	0.002	"	0.100		102	74.5-128			
Ethylbenzene	0.112	0.002	"	0.100		112	66.4-127			
m,p-Xylene	0.221	0.004	"	0.200		110	76.6-124			
o-Xylene	0.110	0.002	"	0.100		110	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		99.1	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		104	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

LCS (B8K1602-BS2)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Benzene	0.113	0.002	mg/kg	0.100		113	77.1-124			
Toluene	0.110	0.002	"	0.100		110	74.5-128			
Ethylbenzene	0.116	0.002	"	0.100		116	66.4-127			
m,p-Xylene	0.230	0.004	"	0.200		115	76.6-124			
o-Xylene	0.115	0.002	"	0.100		115	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		100	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		104	70-130			

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 Denver CO 80204

James Hix
 Project Number: 018-3312
 Project: GWOG - Colorado State #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

LCS (B8K1602-BS3)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Benzene	0.102	0.002	mg/kg	0.100		102	77.1-124			
Toluene	0.099	0.002	"	0.100		98.6	74.5-128			
Ethylbenzene	0.104	0.002	"	0.100		104	66.4-127			
m,p-Xylene	0.206	0.004	"	0.200		103	76.6-124			
o-Xylene	0.104	0.002	"	0.100		104	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		99.5	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		104	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike (B8K1602-MS1)	Source: Y811249-08			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.099	0.002	mg/kg	0.100	ND	99.0	71.8-126			
Toluene	0.095	0.002	"	0.100	ND	94.6	65.1-130			
Ethylbenzene	0.097	0.002	"	0.100	ND	97.2	62.2-130			
m,p-Xylene	0.192	0.004	"	0.200	ND	96.2	46.5-137			
o-Xylene	0.098	0.002	"	0.100	0.0003	97.6	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike (B8K1602-MS2)	Source: Y811249-09			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.110	0.002	mg/kg	0.100	ND	110	71.8-126			
Toluene	0.105	0.002	"	0.100	ND	105	65.1-130			
Ethylbenzene	0.109	0.002	"	0.100	ND	109	62.2-130			
m,p-Xylene	0.216	0.004	"	0.200	ND	108	46.5-137			
o-Xylene	0.109	0.002	"	0.100	ND	109	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike (B8K1602-MS3)	Source: Y811267-01			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.112	0.002	mg/kg	0.100	ND	112	71.8-126			
Toluene	0.107	0.002	"	0.100	ND	107	65.1-130			
Ethylbenzene	0.113	0.002	"	0.100	ND	113	62.2-130			
m,p-Xylene	0.224	0.004	"	0.200	ND	112	46.5-137			
o-Xylene	0.112	0.002	"	0.100	0.0004	112	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		104	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike Dup (B8K1602-MSD1)	Source: Y811249-08			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.107	0.002	mg/kg	0.100	ND	107	71.8-126	8.10	11.3	
Toluene	0.102	0.002	"	0.100	ND	102	65.1-130	7.82	15.4	
Ethylbenzene	0.107	0.002	"	0.100	ND	107	62.2-130	9.45	19.6	
m,p-Xylene	0.211	0.004	"	0.200	ND	105	46.5-137	9.15	19.2	
o-Xylene	0.106	0.002	"	0.100	0.0003	106	54.2-134	7.90	17.9	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		106	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.1	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike Dup (B8K1602-MSD2)	Source: Y811249-09			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.113	0.002	mg/kg	0.100	ND	113	71.8-126	3.07	11.3	
Toluene	0.108	0.002	"	0.100	ND	108	65.1-130	3.12	15.4	
Ethylbenzene	0.112	0.002	"	0.100	ND	112	62.2-130	2.76	19.6	
m,p-Xylene	0.221	0.004	"	0.200	ND	110	46.5-137	2.34	19.2	
o-Xylene	0.112	0.002	"	0.100	ND	112	54.2-134	2.17	17.9	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		103	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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Jen Pellegrini, Project Manager

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James Hix
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 Project: GWOG - Colorado State #2

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8K1602 - EPA 5030 (soil)

Matrix Spike Dup (B8K1602-MSD3)	Source: Y811267-01			Prepared: 11/16/2018 Analyzed: 11/16/2018						
Benzene	0.112	0.002	mg/kg	0.100	ND	112	71.8-126	0.481	11.3	
Toluene	0.106	0.002	"	0.100	ND	106	65.1-130	1.69	15.4	
Ethylbenzene	0.111	0.002	"	0.100	ND	111	62.2-130	1.93	19.6	
m,p-Xylene	0.219	0.004	"	0.200	ND	109	46.5-137	2.38	19.2	
o-Xylene	0.110	0.002	"	0.100	0.0004	110	54.2-134	2.17	17.9	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		108	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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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 B8K1603 - EPA 3550B

Blank (B8K1603-BLK1)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	41		"	50.0		82.9	59-131			

Blank (B8K1603-BLK2)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	36		"	50.0		72.0	59-131			

Blank (B8K1603-BLK3)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	42		"	50.0		84.4	59-131			

LCS (B8K1603-BS1)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Diesel (C10-C28)	885	50.0	mg/kg	1000		88.5	64-121			
Residual Range Organics (C28-C40)	975	200	"	1000		97.5	58-124			
Surrogate: o-Terphenyl	44		"	50.0		87.7	59-131			

LCS (B8K1603-BS2)

Prepared: 11/16/2018 Analyzed: 11/16/2018

Diesel (C10-C28)	891	50.0	mg/kg	1000		89.1	64-121			
Residual Range Organics (C28-C40)	936	200	"	1000		93.6	58-124			

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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
Batch B8K1603 - EPA 3550B										
LCS (B8K1603-BS2)					Prepared: 11/16/2018 Analyzed: 11/16/2018					
Surrogate: o-Terphenyl	42		mg/kg	50.0		84.6	59-131			
LCS (B8K1603-BS3)					Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	931	50.0	mg/kg	1000		93.1	64-121			
Residual Range Organics (C28-C40)	1010	200	"	1000		101	58-124			
Surrogate: o-Terphenyl	45		"	50.0		90.1	59-131			
Matrix Spike (B8K1603-MS1)		Source: Y811249-08			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	996	50.0	mg/kg	1000	ND	99.6	53-125			
Residual Range Organics (C28-C40)	1090	200	"	1000	10.7	107	47-133			
Surrogate: o-Terphenyl	46		"	50.0		92.2	59-131			
Matrix Spike (B8K1603-MS2)		Source: Y811249-09			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	947	50.0	mg/kg	1000	ND	94.7	53-125			
Residual Range Organics (C28-C40)	997	200	"	1000	13.4	98.3	47-133			
Surrogate: o-Terphenyl	43		"	50.0		86.8	59-131			
Matrix Spike (B8K1603-MS3)		Source: Y811267-01			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	958	50.0	mg/kg	1000	ND	95.8	53-125			
Residual Range Organics (C28-C40)	1000	200	"	1000	9.23	99.1	47-133			
Surrogate: o-Terphenyl	42		"	50.0		83.3	59-131			
Matrix Spike Dup (B8K1603-MSD1)		Source: Y811249-08			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	895	50.0	mg/kg	1000	ND	89.5	53-125	10.8	20	
Residual Range Organics (C28-C40)	994	200	"	1000	10.7	98.3	47-133	8.87	20	
Surrogate: o-Terphenyl	42		"	50.0		83.5	59-131			
Matrix Spike Dup (B8K1603-MSD2)		Source: Y811249-09			Prepared: 11/16/2018 Analyzed: 11/16/2018					

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 Project: GWOG - Colorado State #2

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 B8K1603 - EPA 3550B

Matrix Spike Dup (B8K1603-MSD2)		Source: Y811249-09			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	910	50.0	mg/kg	1000	ND	91.0	53-125	3.95	20	
Residual Range Organics (C28-C40)	964	200	"	1000	13.4	95.1	47-133	3.37	20	
<i>Surrogate: o-Terphenyl</i>	43		"	50.0		86.2	59-131			
Matrix Spike Dup (B8K1603-MSD3)		Source: Y811267-01			Prepared: 11/16/2018 Analyzed: 11/16/2018					
Diesel (C10-C28)	948	50.0	mg/kg	1000	ND	94.8	53-125	0.989	20	
Residual Range Organics (C28-C40)	998	200	"	1000	9.23	98.8	47-133	0.203	20	
<i>Surrogate: o-Terphenyl</i>	44		"	50.0		88.3	59-131			

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Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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Jen Pellegrini, Project Manager