



Absaroka  
Joel Mason  
112 High St.

November 11, 2024

Buffalo WY 82834

**Project Name - FEO Spicer Annex Confirmation Samples**      **Project Number - FEO.CO.0701.29**

Attached are your analytical results for FEO Spicer Annex Confirmation Samples received by Origins Laboratory October 15, 2024. This project is associated with Origins project number E410440-09.

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  
303.433.1322  
projectmanager@originslab.com



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

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Buffalo WY 82834

Joel Mason  
Project Number: FEO.CO.0701.29  
Project: FEO Spicer Annex Confirmation Samples

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS_S32_34_@9FT	E410440-09	Soil	October 14, 2024 11:50	10/15/2024 13:42

Origins Laboratory



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E110440

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page 1 of 1

Client: Absaroka Energy and Environmental Solutions  
Address: 112 High St. Buffalo, WY 82834  
Telephone Number: 307-262-8975  
Email Address: joel.mason@absarokasolutions.com

Project Manager: Joel Mason  
Project Name: FEO Spicer Annex Confirmation Samples  
Project Number: FEO.CO.0701.29  
Samples Collected By: joel.mason@absarokasolutions.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative			Matrix			Analysis Table 915.1 Parameters (Rush SAR EC, pH to quickest TAT)	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil		
SS_S32_15_@5ft	10/14/2024	10:30	3	X						X	
SS_S32_15_@6ft	10/14/2024	10:40	3	X						X	
SS_S32_15_@7ft	10/14/2024	10:50	3	X						X	
SS_S32_16_@5ft	10/14/2024	11:00	3	X						X	
SS_S32_16_@6ft	10/14/2024	11:10	3	X						X	
SS_S32_16_@7ft	10/14/2024	11:20	3	X						X	
SS_S32_34_@7ft	10/14/2024	11:30	3	X						X	
SS_S32_34_@8ft	10/14/2024	11:40	3	X						X	
SS_S32_34_@9ft	10/14/2024	11:50	3	X						X	

Relinquished By: [Signature] Date: 10/15/24 Time: 8:42  
Received By: [Signature] Date: 10/15/24 Time: 13:47  
Date Results Needed: 6

Turnaround Time:  
 Same Day  
 24 Hr  
 48 Hr  
 72 Hr  
 Standard  
 10

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[Signature]

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Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: E410440

Client: Absaroka

Client Project ID: Spicer Annex

Checklist Completed by: JAY KK

Shipped Via: HO

Date/time completed: 10/15/12

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

Airbill #: N/A

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

Cooler Number/Temperature: 116 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C (Describe)

Thermometer ID: 7004

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	/			SD
Is there ice present (document if blue ice is used)	/			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		/		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		/		
Were all samples received intact <sup>(1)</sup> ?	/			
Was adequate sample volume provided <sup>(1)</sup> ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		/		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	/			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	/			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	/			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	/			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			/	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH ~2 for samples preserved with HNO <sub>3</sub> , HCl, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)			/	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) JAY

Date/Time Reviewed 10/15/12

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*J. Bynon*

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 Project: FEO Spicer Annex Confirmation Samples

**SS S32 34 @9FT**  
**10/14/2024 11:50:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E410440-09 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	ND		0.0987	mg/L	1	B4J1618	10/16/2024	10/17/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1701	10/17/2024	10/18/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: o-Terphenyl	71.8 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1850	10/18/2024	10/23/2024	Ua
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	Ua
Benzene	ND		0.00200	"	"	"	"	"	Ua
Ethylbenzene	ND		0.00200	"	"	"	"	"	Ua
Toluene	ND		0.00200	"	"	"	"	"	Ua
Xylenes, total	ND		0.00200	"	"	"	"	"	Ua
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	Ua

Surrogate: 1,2-Dichloroethane-d4	110 %		70-130			"	"	"	
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**Origins Laboratory**  
**E410440-09 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: Toluene-d8	95.1 %		70-130			B4J18 50	10/18/2024	10/23/2024	
Surrogate: 4-Bromofluorobenzene	110 %		70-130			"	"	"	

**Metals by Saturated Paste by EPA 6010**

Calcium	0.963		0.499	meq/L	10	[CALC]	10/16/2024	10/18/2024	
Magnesium	ND		0.823	"	"	"	"	"	
Sodium	3.67		0.435	"	"	"	"	"	

**PAH by EPA 8270E extracted via 3580A**

1-Methylnaphthalene	ND		0.002	mg/kg	1	B4J2141	10/21/2024	10/24/2024	Ua
2-Methylnaphthalene	ND		0.002	"	"	"	"	"	Ua
Acenaphthene	ND		0.020	"	"	"	"	"	Ua
Anthracene	ND		0.020	"	"	"	"	"	Ua
Benzo (a) anthracene	ND		0.005	"	"	"	"	"	Ua
Benzo (a) pyrene	ND		0.020	"	"	"	"	"	Ua
Benzo (b) fluoranthene	ND		0.020	"	"	"	"	"	Ua
Benzo (k) fluoranthene	ND		0.020	"	"	"	"	"	Ua
Chrysene	ND		0.020	"	"	"	"	"	Ua
Dibenz (a,h) anthracene	ND		0.020	"	"	"	"	"	Ua
Fluoranthene	ND		0.020	"	"	"	"	"	Ua

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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E410440-09 (Soil)**

**PAH by EPA 8270E extracted via 3580A**

Fluorene	ND	0.020	mg/kg	1	B4J2141	10/21/2024	10/24/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	98.3 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	96.3 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	95.8 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	106 %	60-130	"	"	"	"	"

**pH in Soil by 9045D**

pH	8.34	pH Units	1	B4J1620	10/16/2024	10/18/2024
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**SAR by 20B Saturated Paste**

SAR	4.21	0.0100	SAR	1	B4J1610	10/16/2024	10/18/2024
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	0.562	0.00500	mmhos/cm	1	B4J1620	10/16/2024	10/18/2024
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**Table 915 metals by EPA 6020B**

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**10/14/2024 11:50:00AM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E410440-09 (Soil)**

**Table 915 metals by EPA 6020B**

Arsenic	0.993		0.276	mg/kg	10	B4J1642	10/16/2024	10/17/2024	
Barium	141		9.53	"	"	"	"	"	
Cadmium	0.171		0.0953	"	"	"	"	"	
Copper	30.9		9.53	"	"	"	"	"	
Lead	10.5		0.953	"	"	"	"	"	
Nickel	32.5		0.953	"	"	"	"	"	
Selenium	ND		0.248	"	"	"	"	"	
Silver	ND		0.0953	"	"	"	"	"	
Zinc	95.5		35.3	"	"	"	"	"	

**Total Metals 7196A**

Hexavalent Chromium	ND	0.135	0.336	mg/kg dry	1	2689108	11/05/2024	11/06/2024	U
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**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B4J1701 - EPA 3550B</b>										
<b>Blank (B4J1701-BLK1)</b>										
					Prepared: 10/17/2024 Analyzed: 10/18/2024					
Diesel (C10-C28)	ND	25.0	mg/kg							Ua
Residual Range Organics (C28-C40)	ND	100	"							Ua
Surrogate: o-Terphenyl	21		"	24.9		84.9	50-150			

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**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1701 - EPA 3550B**

**LCS (B4J1701-BS1)**

Prepared: 10/17/2024 Analyzed: 10/18/2024

Diesel (C10-C28)	762	50.0	mg/kg	1000		76.2	70-130			
Residual Range Organics (C28-C40)	866	200	"	1000		86.6	70-130			
Surrogate: o-Terphenyl	39		"	49.8		78.6	50-150			

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Jordan A. Bynon, Project Manager

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**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B4J1701 - EPA 3550B</b>										
<b>Matrix Spike (B4J1701-MS1)</b>		<b>Source: E410404-01</b>			Prepared: 10/17/2024 Analyzed: 10/18/2024					
Diesel (C10-C28)	786	50.0	mg/kg	1000	ND	78.6	70-130			
Residual Range Organics (C28-C40)	902	200	"	1000	ND	90.2	70-130			
Surrogate: o-Terphenyl	45		"	49.8		91.4	50-150			

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**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1701 - EPA 3550B**

<b>Matrix Spike Dup (B4J1701-MSD1)</b>	<b>Source: E410404-01</b>			<b>Prepared: 10/17/2024 Analyzed: 10/18/2024</b>						
Diesel (C10-C28)	768	50.0	mg/kg	1000	ND	76.8	70-130	2.34	35	
Residual Range Organics (C28-C40)	894	200	"	1000	ND	89.4	70-130	0.890	35	
Surrogate: o-Terphenyl	44		"	49.8		88.5	50-150			

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**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B4J1850 - EPA 5030 (soil)</b>										
<b>Blank (B4J1850-BLK1)</b>										
					Prepared: 10/18/2024 Analyzed: 10/22/2024					
1,2,4-Trimethylbenzene	ND	0.00200	mg/kg							Ua
1,3,5-Trimethylbenzene	ND	0.00200	"							Ua
Benzene	ND	0.00200	"							Ua
Ethylbenzene	ND	0.00200	"							Ua
Naphthalene	ND	0.00380	"							Ua
Toluene	ND	0.00200	"							Ua
Xylenes, total	ND	0.00200	"							Ua
Gasoline Range Hydrocarbons	ND	0.200	"							Ua
Surrogate: 1,2-Dichloroethane-d4	0.10		"	0.125		80.9	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	70-130			

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**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1850 - EPA 5030 (soil)**

**LCS (B4J1850-BS1)**

Prepared: 10/18/2024 Analyzed: 10/22/2024

1,2,4-Trimethylbenzene	0.0856	0.00200	mg/kg	0.100		85.6	70-130			
1,3,5-Trimethylbenzene	0.0906	0.00200	"	0.100		90.6	70-130			
Benzene	0.0865	0.00200	"	0.100		86.5	70-130			
Ethylbenzene	0.0887	0.00200	"	0.100		88.7	70-130			
Naphthalene	0.0919	0.00380	"	0.100		91.9	70-130			
Toluene	0.0849	0.00200	"	0.100		84.9	70-130			
o-Xylene	0.0838	0.00200	"	0.100		83.8	70-130			
m,p-Xylene	0.171	0.00400	"	0.200		85.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		107	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		97.8	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 B4J1850 - EPA 5030 (soil)**

<b>Matrix Spike (B4J1850-MS1)</b>	<b>Source: E410440-01</b>			<b>Prepared: 10/18/2024 Analyzed: 10/22/2024</b>						
1,2,4-Trimethylbenzene	0.0847	0.00200	mg/kg	0.100	ND	84.7	70-130			
1,3,5-Trimethylbenzene	0.0850	0.00200	"	0.100	ND	85.0	70-130			
Benzene	0.0785	0.00200	"	0.100	ND	78.5	70-130			
Ethylbenzene	0.0873	0.00200	"	0.100	ND	87.3	70-130			
Naphthalene	0.0658	0.00380	"	0.100	ND	65.8	70-130			QM-07
Toluene	0.0806	0.00200	"	0.100	ND	80.6	70-130			
o-Xylene	0.0849	0.00200	"	0.100	ND	84.9	70-130			
m,p-Xylene	0.171	0.00400	"	0.200	ND	85.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.097		"	0.125		77.5	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	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 B4J1850 - EPA 5030 (soil)**

Matrix Spike Dup (B4J1850-MSD1)	Source: E410440-01			Prepared: 10/18/2024 Analyzed: 10/22/2024						
1,2,4-Trimethylbenzene	0.0828	0.00200	mg/kg	0.100	ND	82.8	70-130	2.24	20	
1,3,5-Trimethylbenzene	0.0818	0.00200	"	0.100	ND	81.8	70-130	3.77	20	
Benzene	0.0782	0.00200	"	0.100	ND	78.2	70-130	0.383	20	
Ethylbenzene	0.0822	0.00200	"	0.100	ND	82.2	70-130	6.04	20	
Naphthalene	0.0805	0.00380	"	0.100	ND	80.5	70-130	20.0	20	
Toluene	0.0773	0.00200	"	0.100	ND	77.3	70-130	4.18	20	
o-Xylene	0.0826	0.00200	"	0.100	ND	82.6	70-130	2.72	20	
m,p-Xylene	0.164	0.00400	"	0.200	ND	82.2	70-130	4.12	20	
Surrogate: 1,2-Dichloroethane-d4	0.11		"	0.125		92.0	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		93.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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 Buffalo WY 82834

Joel Mason  
 Project Number: FEO.CO.0701.29  
 Project: FEO Spicer Annex Confirmation Samples

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Metals by EPA 6000/7000 Series Methods - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1642 - EPA 3050B**

**Blank (B4J1642-BLK1)**

Prepared: 10/16/2024 Analyzed: 10/17/2024

Arsenic	ND	0.290	mg/kg							
Barium	ND	10.0	"							
Cadmium	ND	0.100	"							
Copper	ND	10.0	"							
Lead	ND	1.00	"							
Nickel	ND	1.00	"							
Selenium	ND	0.260	"							
Silver	ND	0.100	"							
Zinc	ND	37.0	"							

**LCS (B4J1642-BS1)**

Prepared: 10/16/2024 Analyzed: 10/17/2024

Arsenic	4.90	0.290	mg/kg	5.00		98.0	80-120			
Barium	517	10.0	"	500		103	80-120			
Cadmium	5.19	0.100	"	5.00		104	80-120			
Copper	52.2	10.0	"	50.0		104	80-120			
Lead	5.07	1.00	"	5.00		101	80-120			
Nickel	5.26	1.00	"	5.00		105	80-120			
Selenium	5.04	0.260	"	5.00		101	80-120			
Silver	5.27	0.100	"	5.00		105	80-120			
Zinc	51.9	37.0	"	50.0		104	80-120			

**Matrix Spike (B4J1642-MS1)**

**Source: E410440-01**

Prepared: 10/16/2024 Analyzed: 10/17/2024

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**Metals by EPA 6000/7000 Series Methods - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1642 - EPA 3050B**

<b>Matrix Spike (B4J1642-MS1)</b>	<b>Source: E410440-01</b>			<b>Prepared: 10/16/2024 Analyzed: 10/17/2024</b>						
Arsenic	6.64	0.283	mg/kg	4.88	1.74	101	75-125			
Barium	760	9.75	"	488	177	119	75-125			
Cadmium	5.19	0.0975	"	4.88	0.122	104	75-125			
Copper	70.3	9.75	"	48.8	20.9	101	75-125			
Lead	13.3	0.975	"	4.88	8.78	92.5	75-125			
Nickel	28.0	0.975	"	4.88	23.1	100	75-125			
Selenium	4.97	0.254	"	4.88	0.121	99.5	75-125			
Silver	5.08	0.0975	"	4.88	0.0395	103	75-125			
Zinc	114	36.1	"	48.8	63.7	103	75-125			

<b>Matrix Spike Dup (B4J1642-MSD1)</b>	<b>Source: E410440-01</b>			<b>Prepared: 10/16/2024 Analyzed: 10/17/2024</b>						
Arsenic	6.26	0.269	mg/kg	4.64	1.74	97.5	75-125	5.88	20	
Barium	694	9.28	"	464	177	111	75-125	9.07	20	
Cadmium	5.00	0.0928	"	4.64	0.122	105	75-125	3.77	20	
Copper	68.8	9.28	"	46.4	20.9	103	75-125	2.11	20	
Lead	13.9	0.928	"	4.64	8.78	110	75-125	4.42	20	
Nickel	29.4	0.928	"	4.64	23.1	136	75-125	4.85	20	QM-07
Selenium	4.64	0.241	"	4.64	0.121	97.4	75-125	6.88	20	
Silver	4.96	0.0928	"	4.64	0.0395	106	75-125	2.43	20	
Zinc	112	34.3	"	46.4	63.7	105	75-125	1.56	20	

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**EPA 8270E (SW846) - Semivolatile Organic Compounds - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J2141 - EPA 3580**

**Blank (B4J2141-BLK1)**

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	ND	0.002	mg/kg							Ua
2-Methylnaphthalene	ND	0.002	"							Ua
Acenaphthene	ND	0.020	"							Ua
Anthracene	ND	0.020	"							Ua
Benzo (a) anthracene	ND	0.005	"							Ua
Benzo (a) pyrene	ND	0.020	"							Ua
Benzo (b) fluoranthene	ND	0.020	"							Ua
Benzo (g,h,i) perylene	ND	0.020	"							Ua
Benzo (k) fluoranthene	ND	0.020	"							Ua
Chrysene	ND	0.020	"							Ua
Dibenz (a,h) anthracene	ND	0.020	"							Ua
Fluoranthene	ND	0.020	"							Ua
Fluorene	ND	0.020	"							Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"							Ua
Naphthalene	ND	0.002	"							Ua
Phenanthrene	ND	0.020	"							Ua
Pyrene	ND	0.020	"							Ua
<hr/>										
Surrogate: Fluorene-d10	190		ug/kg	200		94.5	60-130			
Surrogate: Anthracene-d10	200		"	200		99.7	60-130			
Surrogate: Pyrene-d10	220		"	200		109	60-130			
Surrogate: Benzo (a) pyrene-d12	210		"	200		106	60-130			

**LCS (B4J2141-BS1)**

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	0.190	0.002	mg/kg	0.200		95.2	70-130			
2-Methylnaphthalene	0.191	0.002	"	0.200		95.3	70-130			
Acenaphthene	0.188	0.020	"	0.200		94.2	70-130			
Anthracene	0.197	0.020	"	0.200		98.4	70-130			

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## EPA 8270E (SW846) - Semivolatile Organic Compounds - Quality Control Origins Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J2141 - EPA 3580**

**LCS (B4J2141-BS1)**

Prepared: 10/21/2024 Analyzed: 10/23/2024

Benzo (a) anthracene	0.194	0.005	mg/kg	0.200		96.9	70-130			
Benzo (a) pyrene	0.200	0.020	"	0.200		100	70-130			
Benzo (b) fluoranthene	0.189	0.020	"	0.200		94.4	70-130			
Benzo (g,h,i) perylene	0.189	0.020	"	0.200		94.4	70-130			
Benzo (k) fluoranthene	0.201	0.020	"	0.200		101	70-130			
Chrysene	0.188	0.020	"	0.200		94.1	70-130			
Dibenz (a,h) anthracene	0.186	0.020	"	0.200		93.1	70-130			
Fluoranthene	0.155	0.020	"	0.200		77.5	70-130			
Fluorene	0.178	0.020	"	0.200		88.8	70-130			
Indeno (1,2,3-cd) pyrene	0.222	0.020	"	0.200		111	70-130			
Naphthalene	0.193	0.002	"	0.200		96.3	70-130			
Phenanthrene	0.194	0.020	"	0.200		97.1	70-130			
Pyrene	0.221	0.020	"	0.200		110	70-130			
Surrogate: Fluorene-d10	190		ug/kg	200		94.4	60-130			
Surrogate: Anthracene-d10	200		"	200		99.4	60-130			
Surrogate: Pyrene-d10	230		"	200		116	60-130			
Surrogate: Benzo (a) pyrene-d12	220		"	200		108	60-130			

**Matrix Spike (B4J2141-MS1)**

**Source: E410404-01**

Prepared: 10/21/2024 Analyzed: 10/23/2024

1-Methylnaphthalene	0.227	0.002	mg/kg	0.200	ND	114	70-130			
2-Methylnaphthalene	0.227	0.002	"	0.200	ND	113	70-130			
Acenaphthene	0.223	0.020	"	0.200	ND	111	70-130			
Anthracene	0.229	0.020	"	0.200	ND	114	70-130			
Benzo (a) anthracene	0.231	0.005	"	0.200	ND	116	70-130			
Benzo (a) pyrene	0.232	0.020	"	0.200	0.002	115	70-130			
Benzo (b) fluoranthene	0.223	0.020	"	0.200	ND	112	70-130			
Benzo (g,h,i) perylene	0.213	0.020	"	0.200	0.0003	107	70-130			

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**EPA 8270E (SW846) - Semivolatile Organic Compounds - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J2141 - EPA 3580**

<b>Matrix Spike (B4J2141-MS1)</b>	<b>Source: E410404-01</b>			<b>Prepared: 10/21/2024 Analyzed: 10/23/2024</b>						
Benzo (k) fluoranthene	0.233	0.020	mg/kg	0.200	ND	116	70-130			
Chrysene	0.222	0.020	"	0.200	0.0004	111	70-130			
Dibenz (a,h) anthracene	0.229	0.020	"	0.200	ND	114	70-130			
Fluoranthene	0.224	0.020	"	0.200	ND	112	70-130			
Fluorene	0.222	0.020	"	0.200	0.001	110	70-130			
Indeno (1,2,3-cd) pyrene	0.219	0.020	"	0.200	ND	110	70-130			
Naphthalene	0.226	0.002	"	0.200	ND	113	70-130			
Phenanthrene	0.226	0.020	"	0.200	ND	113	70-130			
Pyrene	0.223	0.020	"	0.200	0.0006	111	70-130			
Surrogate: Fluorene-d10	200		ug/kg	200		98.7	60-130			
Surrogate: Anthracene-d10	200		"	200		98.9	60-130			
Surrogate: Pyrene-d10	200		"	200		99.5	60-130			
Surrogate: Benzo (a) pyrene-d12	200		"	200		101	60-130			

<b>Matrix Spike Dup (B4J2141-MSD1)</b>	<b>Source: E410404-01</b>			<b>Prepared: 10/21/2024 Analyzed: 10/23/2024</b>						
1-Methylnaphthalene	0.219	0.002	mg/kg	0.200	ND	109	70-130	3.86	20	
2-Methylnaphthalene	0.218	0.002	"	0.200	ND	109	70-130	3.86	20	
Acenaphthene	0.214	0.020	"	0.200	ND	107	70-130	3.74	20	
Anthracene	0.220	0.020	"	0.200	ND	110	70-130	3.78	20	
Benzo (a) anthracene	0.216	0.005	"	0.200	ND	108	70-130	6.59	20	
Benzo (a) pyrene	0.218	0.020	"	0.200	0.002	108	70-130	5.93	20	
Benzo (b) fluoranthene	0.223	0.020	"	0.200	ND	112	70-130	0.155	20	
Benzo (g,h,i) perylene	0.211	0.020	"	0.200	0.0003	105	70-130	1.34	20	
Benzo (k) fluoranthene	0.234	0.020	"	0.200	ND	117	70-130	0.437	20	
Chrysene	0.210	0.020	"	0.200	0.0004	105	70-130	5.73	20	
Dibenz (a,h) anthracene	0.221	0.020	"	0.200	ND	110	70-130	3.70	20	
Fluoranthene	0.216	0.020	"	0.200	ND	108	70-130	3.34	20	

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**EPA 8270E (SW846) - Semivolatile Organic Compounds - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J2141 - EPA 3580**

Matrix Spike Dup (B4J2141-MSD1)	Source: E410404-01			Prepared: 10/21/2024 Analyzed: 10/23/2024						
Fluorene	0.212	0.020	mg/kg	0.200	0.001	106	70-130	4.33	20	
Indeno (1,2,3-cd) pyrene	0.217	0.020	"	0.200	ND	108	70-130	1.08	20	
Naphthalene	0.216	0.002	"	0.200	ND	108	70-130	4.75	20	
Phenanthrene	0.217	0.020	"	0.200	ND	109	70-130	3.81	20	
Pyrene	0.213	0.020	"	0.200	0.0006	106	70-130	4.73	20	
Surrogate: Fluorene-d10	200		ug/kg	200		99.0	60-130			
Surrogate: Anthracene-d10	200		"	200		99.0	60-130			
Surrogate: Pyrene-d10	200		"	200		99.0	60-130			
Surrogate: Benzo (a) pyrene-d12	210		"	200		104	60-130			

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**Classical Chemistry Parameters - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1610 - Saturated Paste Metals**

**Blank (B4J1610-BLK1)**

Prepared: 10/16/2024 Analyzed: 10/18/2024

Calcium PPM	ND	10.0	mg/L						
SAR	ND	0.0100	SAR						
Magnesium PPM	ND	10.0	mg/L						
Sodium PPM	ND	10.0	"						

**Duplicate (B4J1610-DUP1)**

**Source: E410440-09**

Prepared: 10/16/2024 Analyzed: 10/18/2024

SAR	ND	0.0100	SAR	4.21				200	
Calcium PPM	19.8	10.0	mg/L	19.3			2.61	50	
Magnesium PPM	6.13	10.0	"	6.76			9.78	50	
Sodium PPM	87.1	10.0	"	84.3			3.27	50	

**Batch B4J1618 - DTPA Sorbitol Preparation**

**Blank (B4J1618-BLK1)**

Prepared: 10/16/2024 Analyzed: 10/17/2024

Boron	ND	0.100	mg/L						
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**Duplicate (B4J1618-DUP1)**

**Source: E410433-01**

Prepared: 10/16/2024 Analyzed: 10/17/2024

Boron	0.143	0.101	mg/L	0.136			5.06	50	
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**Saturated Paste - Quality Control**  
**Origins Laboratory**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B4J1620 - Saturated Paste pH/EC**

**Blank (B4J1620-BLK1)**

Prepared: 10/16/2024 Analyzed: 10/18/2024

Specific Conductance (EC) ND 0.00500 mmhos/cm

**Duplicate (B4J1620-DUP1)**

**Source: E410440-09**

Prepared: 10/16/2024 Analyzed: 10/18/2024

pH	8.38		pH Units	8.34			0.478	25	
Specific Conductance (EC)	0.544	0.00500	mmhos/cm	0.562			3.07	25	

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**Total Metals 7196A - Quality Control**  
**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2689108 - SW846 3060A</b>										
<b>BLANK (1205888911-BLK)</b>					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.376	mg/kg				-			U
<b>LCS (1205888912-BKS)</b>					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	3.95	0.397	mg/kg	3.97		99.3	80-120			
<b>DUP (1205888913 D)</b>					Source: 690226001 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.244	mg/kg dry		<0.0978		0-50	N/A	50	U
<b>MS (1205888914 S)</b>					Source: 690226001 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	2.18	0.244	mg/kg dry	2.44	<0.0978	87.3	75-125			
<b>DUP (1205888915 D)</b>					Source: 690226002 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	ND	0.312	mg/kg dry		<0.125		0-50	N/A	50	U
<b>MS (1205888916 S)</b>					Source: 690226002 Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	2.02	0.312	mg/kg dry	3.12	<0.125	64.6	75-125			
<b>ILCS (1205888917-ILCS)</b>					Prepared: 11/05/2024 Analyzed: 11/06/2024					
Hexavalent Chromium	7.53	0.364	mg/kg	7.33		103	80-120			

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**Notes and Definitions**

Ua Sample is Non-Detect.

U Result not detected above the detection limit

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

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported on a wet weight basis.

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Jordan A. Bynon, Project Manager