



Absaroka
Joel Mason
112 High St.

November 05, 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 11, 2024. This project is associated with Origins project number E410395-01.

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
303.433.1322
projectmanager@originslab.com



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

Absaroka
 112 High St.
 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_39@12FT	E410395-01	Soil	October 7, 2024 10:00	10/11/2024 17:27
SS_S32_40@9FT	E410395-02	Soil	October 7, 2024 10:05	10/11/2024 17:27
SS_S32_41@12FT	E410395-03	Soil	October 7, 2024 10:10	10/11/2024 17:27
SS_S32_42@9FT	E410395-04	Soil	October 7, 2024 10:15	10/11/2024 17:27
SS_S32_43@9FT	E410395-05	Soil	October 7, 2024 10:20	10/11/2024 17:27
SS_S32_44@9FT	E410395-06	Soil	October 7, 2024 10:25	10/11/2024 17:27
SS_S32_45@9FT	E410395-07	Soil	October 7, 2024 10:30	10/11/2024 17:27
SS_S32_46@6FT	E410395-08	Soil	October 7, 2024 10:35	10/11/2024 17:27
SS_S32_47@6FT	E410395-09	Soil	October 7, 2024 10:40	10/11/2024 17:27
SS_S32_48@4FT	E410395-10	Soil	October 7, 2024 10:45	10/11/2024 17:27

Origins Laboratory



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ORIGINS
LABORATORY, INC

E410395

www.originslaboratory.com

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	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil		
SS_S32_39@12h	10/7/2024	10:00	3	X						X	1
SS_S32_40@9h	10/7/2024	10:05	3	X						X	2
SS_S32_41@12h	10/7/2024	10:10	3	X						X	3
SS_S32_42@9h	10/7/2024	10:15	3	X						X	4
SS_S32_43@9h	10/7/2024	10:20	3	X						X	5
SS_S32_44@9h	10/7/2024	10:25	3	X						X	6
SS_S32_45@9h	10/7/2024	10:30	3	X						X	7
SS_S32_46@6h	10/7/2024	10:35	3	X						X	8
SS_S32_47@6h	10/7/2024	10:40	3	X						X	9
SS_S32_48@4h	10/7/2024	10:45	3	X						X	10

Relinquished By: *Joel Mason*

Date: 10/11/24

Time: 17:00

Received By: *JM*

Date: 10/11/24

Time: 17:23

Turnaround Time: 48 Hr 24 Hr Same Day

Standard:

Date Results Needed:

Origins Laboratory

J. Bynon

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112 High St.
Buffalo

WY 82834

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

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: E4103915

Client: Absaroka

Client Project ID: Spicev

Checklist Completed by: ZHD/WS

Shipped Via: HO

Date/time completed: 10/11/24

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

Airbill #: N/A

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

Cooler Number/Temperature: 1155 °C / _____ °C / _____ °C (Describe) _____ °C

Thermometer ID: 1004

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	/			
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 ⁽¹⁾ ?	/			
Was adequate sample volume provided ⁽¹⁾ ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	/	/		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	/			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	/			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	/			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	/			
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 ⁽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)			/	
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) AM

10/15/24
Date/Time Reviewed

Origins Laboratory



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

SS S32 39@12FT
10/7/2024 10:00:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-01 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.0991	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: o-Terphenyl	76.5 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/15/2024	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	113 %		70-130			"	"	"	
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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-01 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.7 %	70-130	B4J15 31	10/15/2024	10/15/2024
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	1.29	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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10/7/2024 10:00:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-01 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND		0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND		0.020	"	"	"	"	"	Ua
Naphthalene	ND		0.002	"	"	"	"	"	Ua
Pyrene	ND		0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	102 %		60-130			"	"	"	
Surrogate: Anthracene-d10	79.1 %		60-130			"	"	"	
Surrogate: Pyrene-d10	113 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	98.0 %		60-130			"	"	"	

pH in Soil by 9045D

pH	8.18			pH Units	1	B4J1518	10/15/2024	10/16/2024	
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SAR by 20B Saturated Paste

SAR	0.148		0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024	
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.192		0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024	
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Table 915 metals by EPA 6020B

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Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-01 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.57		0.260	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	157		8.96	"	"	"	"	"	
Cadmium	0.248		0.0896	"	"	"	"	"	
Copper	15.7		8.96	"	"	"	"	"	
Lead	8.99		0.896	"	"	"	"	"	
Nickel	16.0		0.896	"	"	"	"	"	
Selenium	ND		0.233	"	"	"	"	"	
Silver	ND		0.0896	"	"	"	"	"	
Zinc	51.9		33.2	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.149	0.372	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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SS S32 40@9FT
10/7/2024 10:05:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-02 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.0994	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: o-Terphenyl	71.2 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/15/2024	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	115 %		70-130			"	"	"	
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SS S32 40@9FT
10/7/2024 10:05:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-02 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.8 %	70-130	B4J15 31	10/15/2024	10/15/2024
Surrogate: 4-Bromofluorobenzene	99.8 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	1.13	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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SS S32 40@9FT
10/7/2024 10:05:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-02 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	102 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	78.4 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	111 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	96.5 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	8.20	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.194	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.172	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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

SS S32 40@9FT
10/7/2024 10:05:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-02 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.40		0.287	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	160		9.88	"	"	"	"	"	
Cadmium	0.255		0.0988	"	"	"	"	"	
Copper	14.0		9.88	"	"	"	"	"	
Lead	8.19		0.988	"	"	"	"	"	
Nickel	14.6		0.988	"	"	"	"	"	
Selenium	ND		0.257	"	"	"	"	"	
Silver	ND		0.0988	"	"	"	"	"	
Zinc	49.8		36.6	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.142	0.356	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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Project Number: FEO.CO.0701.29
Project: FEO Spicer Annex Confirmation Samples

SS S32 41@12FT
10/7/2024 10:10:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-03 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.0997	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	71.6 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/15/2024	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	115 %		70-130			"	"	"	
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 Project Number: FEO.CO.0701.29
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SS S32 41@12FT
10/7/2024 10:10:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-03 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.2 %	70-130	B4J15 31	10/15/2024	10/15/2024
Surrogate: 4-Bromofluorobenzene	100 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	5.23	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	1.54	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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

Origins Laboratory



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Absaroka
 112 High St.
 Buffalo WY 82834

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

SS S32 41@12FT
10/7/2024 10:10:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-03 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	94.1 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	80.2 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	106 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	96.8 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	7.89	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.105	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.875	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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Project: FEO Spicer Annex Confirmation Samples

SS S32 41@12FT
10/7/2024 10:10:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-03 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.53		0.250	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	142		8.61	"	"	"	"	"	
Cadmium	0.294		0.0861	"	"	"	"	"	
Copper	16.7		8.61	"	"	"	"	"	
Lead	8.27		0.861	"	"	"	"	"	
Nickel	17.3		0.861	"	"	"	"	"	
Selenium	ND		0.224	"	"	"	"	"	
Silver	ND		0.0861	"	"	"	"	"	
Zinc	52.2		31.9	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.140	0.351	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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10/7/2024 10:15:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-04 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.100	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	67.6 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	116 %		70-130			"	"	"	
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10/7/2024 10:15:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-04 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.4 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	100 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	3.97	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	1.08	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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10/7/2024 10:15:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-04 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	99.4 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	82.2 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	102 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	97.9 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	8.02	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.0892	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.648	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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SS S32 42@9FT
10/7/2024 10:15:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-04 (Soil)

Table 915 metals by EPA 6020B

Arsenic	4.01		0.272	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	179		9.39	"	"	"	"	"	
Cadmium	0.264		0.0939	"	"	"	"	"	
Copper	18.2		9.39	"	"	"	"	"	
Lead	9.88		0.939	"	"	"	"	"	
Nickel	17.7		0.939	"	"	"	"	"	
Selenium	ND		0.244	"	"	"	"	"	
Silver	ND		0.0939	"	"	"	"	"	
Zinc	59.2		34.7	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.176	0.440	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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10/7/2024 10:20:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-05 (Soil)

Boron (DTPA Sorbitol)

Boron	ND	0.100	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND	25.0	mg/kg	1	B4J1501	10/15/2024	10/16/2024	Ua
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	88.5 %	50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND	0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	117 %	70-130			"	"	"	
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 Project: FEO Spicer Annex Confirmation Samples

SS S32 43@9FT
10/7/2024 10:20:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-05 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	97.6 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	4.02	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	1.71	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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10/7/2024 10:20:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-05 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	99.9 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	81.1 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	106 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	98.7 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	7.98	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.206	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.763	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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10/7/2024 10:20:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-05 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.69		0.272	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	140		9.38	"	"	"	"	"	
Cadmium	0.175		0.0938	"	"	"	"	"	
Copper	16.6		9.38	"	"	"	"	"	
Lead	9.06		0.938	"	"	"	"	"	
Nickel	14.4		0.938	"	"	"	"	"	
Selenium	ND		0.244	"	"	"	"	"	
Silver	ND		0.0938	"	"	"	"	"	
Zinc	58.5		34.7	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.148	0.371	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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 Project: FEO Spicer Annex Confirmation Samples

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10/7/2024 10:25:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-06 (Soil)

Boron (DTPA Sorbitol)

Boron	ND	0.0997	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND	25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	57.1 %	50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND	0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	117 %	70-130			"	"	"	
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10/7/2024 10:25:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-06 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.5 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	1.94	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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SS S32 44@9FT
10/7/2024 10:25:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-06 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	108 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	78.0 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	105 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	96.5 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	8.03	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.0973	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.300	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

Origins Laboratory



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112 High St.
Buffalo WY 82834

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

SS S32 44@9FT
10/7/2024 10:25:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-06 (Soil)

Table 915 metals by EPA 6020B

Arsenic	4.16		0.286	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	177		9.85	"	"	"	"	"	
Cadmium	0.299		0.0985	"	"	"	"	"	
Copper	15.4		9.85	"	"	"	"	"	
Lead	8.80		0.985	"	"	"	"	"	
Nickel	16.6		0.985	"	"	"	"	"	
Selenium	ND		0.256	"	"	"	"	"	
Silver	ND		0.0985	"	"	"	"	"	
Zinc	55.4		36.4	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.135	0.338	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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SS S32 45@9FT
10/7/2024 10:30:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-07 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.101	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	66.2 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	119 %		70-130			"	"	"	
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SS S32 45@9FT
10/7/2024 10:30:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-07 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	98.7 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	2.42	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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SS S32 45@9FT
10/7/2024 10:30:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-07 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	98.6 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	79.0 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	111 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	92.8 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	8.07	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.182	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.384	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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SS S32 45@9FT
10/7/2024 10:30:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-07 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.95		0.261	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	195		9.02	"	"	"	"	"	
Cadmium	0.391		0.0902	"	"	"	"	"	
Copper	15.7		9.02	"	"	"	"	"	
Lead	8.27		0.902	"	"	"	"	"	
Nickel	16.7		0.902	"	"	"	"	"	
Selenium	ND		0.234	"	"	"	"	"	
Silver	ND		0.0902	"	"	"	"	"	
Zinc	54.2		33.4	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.168	0.420	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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SS S32 46@6FT
10/7/2024 10:35:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-08 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.0992	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	70.6 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	116 %		70-130			"	"	"	
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SS S32 46@6FT
10/7/2024 10:35:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-08 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	100 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	102 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	1.89	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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10/7/2024 10:35:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-08 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND	0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND	0.020	"	"	"	"	"	Ua
Naphthalene	ND	0.002	"	"	"	"	"	Ua
Pyrene	ND	0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	102 %	60-130	"	"	"	"	"
Surrogate: Anthracene-d10	77.3 %	60-130	"	"	"	"	"
Surrogate: Pyrene-d10	104 %	60-130	"	"	"	"	"
Surrogate: Benzo (a) pyrene-d12	97.8 %	60-130	"	"	"	"	"

pH in Soil by 9045D

pH	8.06	pH Units	1	B4J1518	10/15/2024	10/16/2024
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SAR by 20B Saturated Paste

SAR	0.107	0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.264	0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024
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Table 915 metals by EPA 6020B

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SS S32 46@6FT
10/7/2024 10:35:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-08 (Soil)

Table 915 metals by EPA 6020B

Arsenic	4.25		0.276	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Barium	189		9.50	"	"	"	"	"	
Cadmium	0.447		0.0950	"	"	"	"	"	
Copper	13.5		9.50	"	"	"	"	"	
Lead	3.66		0.950	"	"	"	"	"	
Nickel	16.1		0.950	"	"	"	"	"	
Selenium	ND		0.247	"	"	"	"	"	
Silver	ND		0.0950	"	"	"	"	"	
Zinc	41.2		35.2	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.155	0.388	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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Project: FEO Spicer Annex Confirmation Samples

SS S32 47@6FT
10/7/2024 10:40:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-09 (Soil)

Boron (DTPA Sorbitol)

Boron	ND		0.0999	mg/L	1	B4J1506	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/15/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: *o*-Terphenyl 73.3 % 50-150 " " "

GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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 118 % 70-130 " " "

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 Project: FEO Spicer Annex Confirmation Samples

SS S32 47@6FT
10/7/2024 10:40:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-09 (Soil)

GBTEX+TMBs by 8260D

Surrogate: Toluene-d8	99.0 %	70-130	B4J15 31	10/15/2024	10/16/2024
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Metals by Saturated Paste by EPA 6010

Calcium	1.21	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	ND	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	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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Joel Mason
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Project: FEO Spicer Annex Confirmation Samples

SS S32 47@6FT
10/7/2024 10:40:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-09 (Soil)

PAH by EPA 8270E extracted via 3580A

Fluorene	ND		0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Indeno (1,2,3-cd) pyrene	ND		0.020	"	"	"	"	"	Ua
Naphthalene	ND		0.002	"	"	"	"	"	Ua
Pyrene	ND		0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	106 %		60-130			"	"	"	
Surrogate: Anthracene-d10	78.7 %		60-130			"	"	"	
Surrogate: Pyrene-d10	106 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	98.5 %		60-130			"	"	"	

pH in Soil by 9045D

pH	8.24			pH Units	1	B4J1518	10/15/2024	10/16/2024	
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SAR by 20B Saturated Paste

SAR	0.231		0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024	
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.197		0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024	
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Table 915 metals by EPA 6020B

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Project: FEO Spicer Annex Confirmation Samples

SS S32 47@6FT
10/7/2024 10:40:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-09 (Soil)

Table 915 metals by EPA 6020B

Arsenic	3.76		0.267	mg/kg	10	B4J1435	10/14/2024	10/16/2024	
Barium	151		9.20	"	"	"	"	"	
Cadmium	0.340		0.0920	"	"	"	"	"	
Copper	16.8		9.20	"	"	"	"	"	
Lead	9.31		0.920	"	"	"	"	"	
Nickel	17.7		0.920	"	"	"	"	"	
Selenium	ND		0.239	"	"	"	"	"	
Silver	ND		0.0920	"	"	"	"	"	
Zinc	56.3		34.0	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.163	0.408	mg/kg dry	1	2689017	10/25/2024	10/30/2024	U
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Absaroka
 112 High St.
 Buffalo WY 82834

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

SS S32 48@4FT
10/7/2024 10:45:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-10 (Soil)

Boron (DTPA Sorbitol)

Boron	0.103		0.0998	mg/L	1	B4J1507	10/15/2024	10/17/2024	
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DRO/ORO by EPA 8015D

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4J1501	10/15/2024	10/16/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	80.0 %		50-150			"	"	"	
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GBTEX+TMBs by 8260D

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4J1531	10/15/2024	10/16/2024	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	125 %		70-130			"	"	"	
Surrogate: Toluene-d8	97.8 %		70-130			"	"	"	

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SS S32 48@4FT
10/7/2024 10:45:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-10 (Soil)

GBTEX+TMBs by 8260D

Surrogate: 4-Bromofluorobenzene	99.1 %	70-130			B4J15 31	10/15/2024	10/16/2024
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Metals by Saturated Paste by EPA 6010

Calcium	ND	0.499	meq/L	10	[CALC]	10/15/2024	10/17/2024
Magnesium	ND	0.823	"	"	"	"	"
Sodium	ND	0.435	"	"	"	"	"

PAH by EPA 8270E extracted via 3580A

1-Methylnaphthalene	0.005	0.002	mg/kg	1	B4J1632	10/16/2024	10/19/2024	
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
Fluorene	ND	0.020	"	"	"	"	"	Ua

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SS S32 48@4FT
10/7/2024 10:45:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory
E410395-10 (Soil)

PAH by EPA 8270E extracted via 3580A

Indeno (1,2,3-cd) pyrene	ND		0.020	mg/kg	1	B4J1632	10/16/2024	10/19/2024	Ua
Naphthalene	ND		0.002	"	"	"	"	"	Ua
Pyrene	ND		0.020	"	"	"	"	"	Ua

Surrogate: Fluorene-d10	103 %		60-130			"	"	"	
Surrogate: Anthracene-d10	83.5 %		60-130			"	"	"	
Surrogate: Pyrene-d10	110 %		60-130			"	"	"	
Surrogate: Benzo (a) pyrene-d12	101 %		60-130			"	"	"	

pH in Soil by 9045D

pH	7.68			pH Units	1	B4J1518	10/15/2024	10/16/2024	
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SAR by 20B Saturated Paste

SAR	0.309		0.0100	SAR	1	B4J1510	10/15/2024	10/17/2024	
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Specific Conductance Mod. 9050A

Specific Conductance (EC)	0.104		0.00500	mmhos/cm	1	B4J1518	10/15/2024	10/16/2024	
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Table 915 metals by EPA 6020B

Arsenic	3.47		0.266	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
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SS S32 48@4FT
10/7/2024 10:45:00AM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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E410395-10 (Soil)

Table 915 metals by EPA 6020B

Barium	154		9.18	mg/kg	10	B4J1439	10/14/2024	10/16/2024	
Cadmium	0.207		0.0918	"	"	"	"	"	
Copper	15.4		9.18	"	"	"	"	"	
Lead	8.28		0.918	"	"	"	"	"	
Nickel	16.2		0.918	"	"	"	"	"	
Selenium	0.248		0.239	"	"	"	"	"	
Silver	ND		0.0918	"	"	"	"	"	
Zinc	47.0		34.0	"	"	"	"	"	

Total Metals 7196A

Hexavalent Chromium	ND	0.172	0.429	mg/kg dry	1	2689017	10/25/2024	10/30/2024	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
Batch B4J1501 - EPA 3550B										
Blank (B4J1501-BLK1)										
					Prepared: 10/15/2024 Analyzed: 10/15/2024					
Diesel (C10-C28)	ND	25.0	mg/kg							Ua
Residual Range Organics (C28-C40)	ND	100	"							Ua
Surrogate: o-Terphenyl	18		"	24.9		72.0	50-150			

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 Jordan A. Bynon, Project Manager



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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 B4J1501 - EPA 3550B

LCS (B4J1501-BS1)

Prepared: 10/15/2024 Analyzed: 10/16/2024

Diesel (C10-C28)	942	50.0	mg/kg	1000		94.2	70-130			
Residual Range Organics (C28-C40)	976	200	"	1000		97.6	70-130			
Surrogate: o-Terphenyl	45		"	49.8		89.6	50-150			

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Jordan A. Bynon, Project Manager



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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 B4J1501 - EPA 3550B

Matrix Spike (B4J1501-MS1)	Source: E410395-01			Prepared: 10/15/2024 Analyzed: 10/16/2024						
Diesel (C10-C28)	938	50.0	mg/kg	1000	ND	93.8	70-130			
Residual Range Organics (C28-C40)	963	200	"	1000	ND	96.3	70-130			
Surrogate: o-Terphenyl	42		"	49.8		85.3	50-150			

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Jordan A. Bynon, Project Manager

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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
Batch B4J1501 - EPA 3550B										
Matrix Spike Dup (B4J1501-MSD1)					Source: E410395-01					Prepared: 10/15/2024 Analyzed: 10/16/2024
Diesel (C10-C28)	883	50.0	mg/kg	1000	ND	88.3	70-130	6.10	35	
Residual Range Organics (C28-C40)	901	200	"	1000	ND	90.1	70-130	6.65	35	
Surrogate: o-Terphenyl	39		"	49.8		78.6	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
Batch B4J1531 - EPA 5030 (soil)										
Blank (B4J1531-BLK1)										
					Prepared: 10/15/2024 Analyzed: 10/15/2024					
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	0.12		"	0.125		97.8	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.7	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 B4J1531 - EPA 5030 (soil)

LCS (B4J1531-BS1)

Prepared: 10/15/2024 Analyzed: 10/15/2024

1,2,4-Trimethylbenzene	0.116	0.00200	mg/kg	0.100		116	70-130			
1,3,5-Trimethylbenzene	0.117	0.00200	"	0.100		117	70-130			
Benzene	0.0993	0.00200	"	0.100		99.3	70-130			
Ethylbenzene	0.110	0.00200	"	0.100		110	70-130			
Naphthalene	0.107	0.00380	"	0.100		107	70-130			
Toluene	0.0999	0.00200	"	0.100		99.9	70-130			
o-Xylene	0.115	0.00200	"	0.100		115	70-130			
m,p-Xylene	0.229	0.00400	"	0.200		115	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		92.7	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	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 B4J1531 - EPA 5030 (soil)

Matrix Spike (B4J1531-MS1)	Source: E410391-01			Prepared: 10/15/2024 Analyzed: 10/15/2024						
1,2,4-Trimethylbenzene	0.107	0.00200	mg/kg	0.100	ND	107	70-130			
1,3,5-Trimethylbenzene	0.108	0.00200	"	0.100	ND	108	70-130			
Benzene	0.0902	0.00200	"	0.100	ND	90.2	70-130			
Ethylbenzene	0.103	0.00200	"	0.100	ND	103	70-130			
Naphthalene	0.0894	0.00380	"	0.100	ND	89.4	70-130			
Toluene	0.0932	0.00200	"	0.100	ND	93.2	70-130			
o-Xylene	0.106	0.00200	"	0.100	ND	106	70-130			
m,p-Xylene	0.217	0.00400	"	0.200	ND	109	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.11		"	0.125		91.7	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	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 B4J1531 - EPA 5030 (soil)

Matrix Spike Dup (B4J1531-MSD1)	Source: E410391-01			Prepared: 10/15/2024 Analyzed: 10/15/2024						
1,2,4-Trimethylbenzene	0.102	0.00200	mg/kg	0.100	ND	102	70-130	4.33	20	
1,3,5-Trimethylbenzene	0.102	0.00200	"	0.100	ND	102	70-130	5.39	20	
Benzene	0.0881	0.00200	"	0.100	ND	88.1	70-130	2.33	20	
Ethylbenzene	0.0979	0.00200	"	0.100	ND	97.9	70-130	4.90	20	
Naphthalene	0.0932	0.00380	"	0.100	ND	93.2	70-130	4.25	20	
Toluene	0.0898	0.00200	"	0.100	ND	89.8	70-130	3.65	20	
o-Xylene	0.102	0.00200	"	0.100	ND	102	70-130	4.73	20	
m,p-Xylene	0.207	0.00400	"	0.200	ND	104	70-130	4.72	20	
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		96.6	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	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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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 B4J1435 - EPA 3050B

Blank (B4J1435-BLK1)

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic ND 0.290 mg/kg

LCS (B4J1435-BS1)

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic 5.60 0.290 mg/kg 5.00 112 80-120

Matrix Spike (B4J1435-MS1)

Source: E409011-01

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic 24.0 0.264 mg/kg 4.54 20.3 81.1 75-125

Matrix Spike Dup (B4J1435-MSD1)

Source: E409011-01

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic 23.3 0.243 mg/kg 4.18 20.3 73.3 75-125 2.61 20 QM-07

Batch B4J1439 - EPA 3050B

Blank (B4J1439-BLK1)

Prepared: 10/14/2024 Analyzed: 10/16/2024

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 "

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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 B4J1439 - EPA 3050B

LCS (B4J1439-BS1)

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic	5.47	0.290	mg/kg	5.00		109	80-120			
Barium	528	10.0	"	500		106	80-120			
Cadmium	5.81	0.100	"	5.00		116	80-120			
Copper	57.6	10.0	"	50.0		115	80-120			
Lead	5.65	1.00	"	5.00		113	80-120			
Nickel	5.69	1.00	"	5.00		114	80-120			
Selenium	5.39	0.260	"	5.00		108	80-120			
Silver	5.86	0.100	"	5.00		117	80-120			
Zinc	54.1	37.0	"	50.0		108	80-120			

Matrix Spike (B4J1439-MS1)

Source: E410398-01

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic	6.94	0.262	mg/kg	4.51	2.25	104	75-125			
Barium	558	9.03	"	451	53.4	112	75-125			
Cadmium	5.16	0.0903	"	4.51	0.0826	113	75-125			
Copper	56.0	9.03	"	45.1	5.00	113	75-125			
Lead	10.2	0.903	"	4.51	5.10	113	75-125			
Nickel	11.5	0.903	"	4.51	6.71	106	75-125			
Selenium	4.94	0.235	"	4.51	0.0654	108	75-125			
Silver	5.16	0.0903	"	4.51	0.0191	114	75-125			
Zinc	73.4	33.4	"	45.1	26.2	105	75-125			

Matrix Spike Dup (B4J1439-MSD1)

Source: E410398-01

Prepared: 10/14/2024 Analyzed: 10/16/2024

Arsenic	6.97	0.260	mg/kg	4.49	2.25	105	75-125	0.424	20	
Barium	558	8.97	"	449	53.4	112	75-125	0.0277	20	
Cadmium	5.24	0.0897	"	4.49	0.0826	115	75-125	1.45	20	
Copper	56.3	8.97	"	44.9	5.00	114	75-125	0.387	20	
Lead	10.9	0.897	"	4.49	5.10	129	75-125	6.73	20	QM-07

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

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 B4J1439 - EPA 3050B

Matrix Spike Dup (B4J1439-MSD1)	Source: E410398-01			Prepared: 10/14/2024 Analyzed: 10/16/2024						
Nickel	11.5	0.897	mg/kg	4.49	6.71	106	75-125	0.236	20	
Selenium	5.08	0.233	"	4.49	0.0654	112	75-125	2.68	20	
Silver	5.31	0.0897	"	4.49	0.0191	118	75-125	2.95	20	
Zinc	72.6	33.2	"	44.9	26.2	103	75-125	1.09	20	

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 Jordan A. Bynon, Project Manager

Absaroka
112 High St.
Buffalo WY 82834

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

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 B4J1632 - EPA 3580

Blank (B4J1632-BLK1)

Prepared: 10/16/2024 Analyzed: 10/19/2024

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

Surrogate: Fluorene-d10	210		ug/kg	200	104	60-130
Surrogate: Anthracene-d10	170		"	200	85.5	60-130
Surrogate: Pyrene-d10	210		"	200	106	60-130
Surrogate: Benzo (a) pyrene-d12	190		"	200	97.1	60-130

LCS (B4J1632-BS1)

Prepared: 10/16/2024 Analyzed: 10/19/2024

1-Methylnaphthalene	0.173	0.002	mg/kg	0.200	86.3	70-130
2-Methylnaphthalene	0.181	0.002	"	0.200	90.6	70-130
Acenaphthene	0.210	0.020	"	0.200	105	70-130
Anthracene	0.161	0.020	"	0.200	80.7	70-130

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Project: FEO Spicer Annex Confirmation Samples

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 B4J1632 - EPA 3580

LCS (B4J1632-BS1)

Prepared: 10/16/2024 Analyzed: 10/19/2024

Benzo (a) anthracene	0.201	0.005	mg/kg	0.200		101	70-130			
Benzo (a) pyrene	0.189	0.020	"	0.200		94.3	70-130			
Benzo (b) fluoranthene	0.198	0.020	"	0.200		99.1	70-130			
Benzo (g,h,i) perylene	0.197	0.020	"	0.200		98.3	70-130			
Benzo (k) fluoranthene	0.194	0.020	"	0.200		97.2	70-130			
Chrysene	0.208	0.020	"	0.200		104	70-130			
Dibenz (a,h) anthracene	0.201	0.020	"	0.200		100	70-130			
Fluoranthene	0.211	0.020	"	0.200		105	70-130			
Fluorene	0.216	0.020	"	0.200		108	70-130			
Indeno (1,2,3-cd) pyrene	0.237	0.020	"	0.200		119	70-130			
Naphthalene	0.187	0.002	"	0.200		93.6	70-130			
Phenanthrene	0.184	0.020	"	0.200		92.1	70-130			
Pyrene	0.219	0.020	"	0.200		110	70-130			
Surrogate: Fluorene-d10	220		ug/kg	200		110	60-130			
Surrogate: Anthracene-d10	170		"	200		84.4	60-130			
Surrogate: Pyrene-d10	200		"	200		100	60-130			
Surrogate: Benzo (a) pyrene-d12	190		"	200		95.5	60-130			

Matrix Spike (B4J1632-MS1)

Source: E410380-01

Prepared: 10/16/2024 Analyzed: 10/19/2024

1-Methylnaphthalene	0.181	0.002	mg/kg	0.200	0.020	80.6	70-130			
2-Methylnaphthalene	0.181	0.002	"	0.200	0.009	86.2	70-130			
Acenaphthene	0.213	0.020	"	0.200	0.011	101	70-130			
Anthracene	0.173	0.020	"	0.200	0.007	83.0	70-130			
Benzo (a) anthracene	0.183	0.005	"	0.200	0.0003	91.1	70-130			
Benzo (a) pyrene	0.184	0.020	"	0.200	0.001	91.3	70-130			
Benzo (b) fluoranthene	0.196	0.020	"	0.200	0.003	96.7	70-130			
Benzo (g,h,i) perylene	0.195	0.020	"	0.200	0.002	96.3	70-130			

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Buffalo WY 82834

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

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 B4J1632 - EPA 3580

Matrix Spike (B4J1632-MS1)	Source: E410380-01			Prepared: 10/16/2024 Analyzed: 10/19/2024						
Benzo (k) fluoranthene	0.188	0.020	mg/kg	0.200	0.003	92.5	70-130			
Chrysene	0.185	0.020	"	0.200	0.007	89.0	70-130			
Dibenz (a,h) anthracene	0.196	0.020	"	0.200	ND	97.8	70-130			
Fluoranthene	0.211	0.020	"	0.200	0.001	105	70-130			
Fluorene	0.220	0.020	"	0.200	0.014	103	70-130			
Indeno (1,2,3-cd) pyrene	0.235	0.020	"	0.200	0.004	116	70-130			
Naphthalene	0.182	0.002	"	0.200	0.002	90.0	70-130			
Phenanthrene	0.189	0.020	"	0.200	0.014	87.5	70-130			
Pyrene	0.233	0.020	"	0.200	0.002	115	70-130			
Surrogate: Fluorene-d10	220		ug/kg	200		111	60-130			
Surrogate: Anthracene-d10	160		"	200		81.8	60-130			
Surrogate: Pyrene-d10	220		"	200		110	60-130			
Surrogate: Benzo (a) pyrene-d12	190		"	200		96.3	60-130			

Matrix Spike Dup (B4J1632-MSD1)	Source: E410380-01			Prepared: 10/16/2024 Analyzed: 10/19/2024						
1-Methylnaphthalene	0.250	0.002	mg/kg	0.200	0.020	115	70-130	31.8	20	QR-02
2-Methylnaphthalene	0.239	0.002	"	0.200	0.009	115	70-130	27.7	20	QR-02
Acenaphthene	0.246	0.020	"	0.200	0.011	117	70-130	14.5	20	
Anthracene	0.211	0.020	"	0.200	0.007	102	70-130	20.1	20	QR-02
Benzo (a) anthracene	0.225	0.005	"	0.200	0.0003	112	70-130	20.9	20	QR-02
Benzo (a) pyrene	0.230	0.020	"	0.200	0.001	114	70-130	22.4	20	QR-02
Benzo (b) fluoranthene	0.251	0.020	"	0.200	0.003	124	70-130	24.6	20	QR-02
Benzo (g,h,i) perylene	0.242	0.020	"	0.200	0.002	120	70-130	21.5	20	QR-02
Benzo (k) fluoranthene	0.231	0.020	"	0.200	0.003	114	70-130	20.7	20	QR-02
Chrysene	0.231	0.020	"	0.200	0.007	112	70-130	22.2	20	QR-02
Dibenz (a,h) anthracene	0.239	0.020	"	0.200	ND	120	70-130	20.0	20	
Fluoranthene	0.244	0.020	"	0.200	0.001	121	70-130	14.7	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 B4J1632 - EPA 3580

Matrix Spike Dup (B4J1632-MSD1)	Source: E410380-01			Prepared: 10/16/2024 Analyzed: 10/19/2024						
Fluorene	0.258	0.020	mg/kg	0.200	0.014	122	70-130	15.9	20	
Indeno (1,2,3-cd) pyrene	0.234	0.020	"	0.200	0.004	115	70-130	0.628	20	
Naphthalene	0.226	0.002	"	0.200	0.002	112	70-130	21.5	20	QR-02
Phenanthrene	0.233	0.020	"	0.200	0.014	109	70-130	20.8	20	QR-02
Pyrene	0.257	0.020	"	0.200	0.002	127	70-130	9.87	20	
Surrogate: Fluorene-d10	210		ug/kg	200		106	60-130			
Surrogate: Anthracene-d10	160		"	200		82.2	60-130			
Surrogate: Pyrene-d10	210		"	200		106	60-130			
Surrogate: Benzo (a) pyrene-d12	200		"	200		99.7	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
Batch B4J1506 - DTPA Sorbitol Preparation										
Blank (B4J1506-BLK1)					Prepared: 10/15/2024 Analyzed: 10/17/2024					
Boron	ND	0.100	mg/L							
Duplicate (B4J1506-DUP1)		Source: E410380-01			Prepared: 10/15/2024 Analyzed: 10/17/2024					
Boron	0.408	0.0984	mg/L		0.417			2.22	50	
Batch B4J1507 - DTPA Sorbitol Preparation										
Blank (B4J1507-BLK1)					Prepared: 10/15/2024 Analyzed: 10/17/2024					
Boron	ND	0.100	mg/L							
Duplicate (B4J1507-DUP1)		Source: E410395-10			Prepared: 10/15/2024 Analyzed: 10/17/2024					
Boron	0.0933	0.101	mg/L		0.103			10.0	50	
Batch B4J1510 - Saturated Paste Metals										
Blank (B4J1510-BLK1)					Prepared: 10/15/2024 Analyzed: 10/17/2024					
SAR	ND	0.0100	SAR							
Calcium PPM	ND	10.0	mg/L							
Magnesium PPM	ND	10.0	"							
Sodium PPM	ND	10.0	"							
Duplicate (B4J1510-DUP1)		Source: E410355-01			Prepared: 10/15/2024 Analyzed: 10/17/2024					
Calcium PPM	38.1	10.0	mg/L		31.8			18.1	50	
SAR	ND	0.0100	SAR		1.36				200	
Magnesium PPM	9.54	10.0	mg/L		8.03			17.2	50	
Sodium PPM	38.2	10.0	"		33.1			14.3	50	

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Saturated Paste - 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 B4J1518 - Saturated Paste pH/EC

Blank (B4J1518-BLK1)

Prepared: 10/15/2024 Analyzed: 10/16/2024

Specific Conductance (EC) ND 0.00500 mmhos/cm

Duplicate (B4J1518-DUP1)

Source: E410355-01

Prepared: 10/15/2024 Analyzed: 10/16/2024

pH	8.16		pH Units	8.16			0.00	25	
Specific Conductance (EC)	0.532	0.00500	mmhos/cm	0.429			21.4	25	

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Jordan A. Bynon, Project Manager

Absaroka
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Buffalo WY 82834

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

Total Metals 7196A - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2689017 - SW846 3060A										
BLANK (1205888675-BLK)					Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	ND	0.315	mg/kg				-			U
LCS (1205888676-BKS)					Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	3.33	0.331	mg/kg	3.31		101	80-120			
DUP (1205888677 D)					Source: 689449001 Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	ND	0.430	mg/kg dry		<0.172		0-50	N/A	50	U
MS (1205888678 S)					Source: 689449001 Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	2.91	0.377	mg/kg dry	3.77	<0.151	77.1	75-125			
DUP (1205888679 D)					Source: 689449002 Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	ND	0.314	mg/kg dry		<0.126		0-50	N/A	50	U
MS (1205888680 S)					Source: 689449002 Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	2.79	0.384	mg/kg dry	3.84	<0.153	72.7	75-125			
ILCS (1205888681-ILCS)					Prepared: 10/25/2024 Analyzed: 10/30/2024					
Hexavalent Chromium	7.22	0.351	mg/kg	7.08		102	80-120			

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Notes and Definitions

Ua Sample is Non-Detect.

U Result not detected above the detection limit

QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

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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