

# ORIGINS LABORATORY

Absaroka  
Joel Mason  
112 High St.

Buffalo WY 82834

February 14, 2025

**Project Name - Citation Firr**

**Project Number - CIT.CO.1055**

Attached are your analytical results for Citation Firr received by Origins Laboratory January 17, 2025. This project is associated with Origins project number E5A0391-01.

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



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112 High St.  
Buffalo WY 82834

Joel Mason  
Project Number: CIT.CO.1055  
Project: Citation Firr

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MCC24_3_SS01@4'	E5A0391-01	Soil	January 14, 2025 12:05	01/17/2025 15:00

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**LSJFV011**

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#	Sample ID	Date Sampled	Time Sampled	# of Containers	Matrix Preservative	Analysis		Comments
						UVP	X	
1	MCC243-S0104*	11/4/2025	1205	3	S	UVP	X	
2								
3								
4								
5								
6								
7								
8								
9								
10								

Client: Citation/ Absaroka  
 Address: \_\_\_\_\_  
 Telephone Number: 307-262-9375  
 Email Address: joel.mason@astrosolutions.com  
 Project Manager: Joel Mason  
 Project Name: Citation Firr  
 Project Number: CIT.CO.1055  
 Collected By: Joel Mason  
 Invoice/Billing Info: On File - Citation  
 Key: W=Water  
GM=Groundwater  
SW=Surface Water  
WW=Waste Water

Requisitioned By: [Signature]  
 Date: 11/17/25  
 Time: 1:06  
 Received By: [Signature]  
 Date: 11/17/25  
 Time: 1:00

Temp Receiver: 63C Received on Ice?  Yes  No

For Lab Sample Receiving Only:  
 Standard  
 48 Hr  72  
 SAME DAY  24

Origins Laboratory  
[Signature]

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Project: Citation Firr

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

**Sample Receipt Checklist**

Origins Work Order: ESA0391 Client: Absaroka  
 Checklist Completed by: EH/JSKM Client Project ID: Firr  
 Date/time completed: 1/17/25 Shipped Via: HO  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: N/A

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
 Cooler Number/Temperature: 1163 c (Describe)  
 Thermometer ID: 7007

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> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTS due within 48 hours present <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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 HNO3, HCL, H2SO4) / (pH > 10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Additional Comments (if any): <u>OK to proceed out of temp per clients email on 1/21/25 EHO</u>				

<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) AS Date/Time Reviewed 1/21/25

Origins Laboratory

*EHO*

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Project: Citation Firr

MCC24-3 SS01@4'  
1/14/2025 12:05:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
E5A0391-01 (Soil)

**Boron (DTPA Sorbitol)**

Boron	0.430		0.0993	mg/L	1	B5A2015	01/20/2025	01/21/2025	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B5A2001	01/20/2025	01/20/2025	U
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	U

Surrogate: o-Terphenyl	88.9 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B5A2111	01/21/2025	01/21/2025	U
1,3,5-Trimethylbenzene	ND		0.00200	"	"	"	"	"	U
Benzene	ND		0.00200	"	"	"	"	"	U
Ethylbenzene	ND		0.00200	"	"	"	"	"	U
Toluene	ND		0.00200	"	"	"	"	"	U
Xylenes, total	ND		0.00200	"	"	"	"	"	U
Gasoline Range Hydrocarbons	ND		0.200	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4	110 %		70-130			"	"	"	
Surrogate: Toluene-d8	96.9 %		70-130			"	"	"	

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MCC24-3 SS01@4'  
1/14/2025 12:05:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
E5A0391-01 (Soil)

**GBTEX+TMBs by 8260D**

Surrogate: 4-Bromofluorobenzene	109 %	70-130	B5A21 11	01/21/2025	01/21/2025
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**Metals by Saturated Paste by EPA 6010**

Calcium	ND	0.499	meq/L	10	[CALC]	01/20/2025	01/22/2025
Magnesium	ND	0.823	"	"	"	"	"
Sodium	11.7	0.435	"	"	"	"	"

**PAH by SW8270**

1-Methylnaphthalene	ND	0.00296	0.00600	mg/kg	1	BIA0797	01/22/2025	01/22/2025
2-Methylnaphthalene	ND	0.00740	0.0150	"	"	"	"	"
Acenaphthene	ND	0.0411	0.0833	"	"	"	"	"
Anthracene	ND	0.0411	0.0833	"	"	"	"	"
Benzo (a) anthracene	ND	0.00543	0.0110	"	"	"	"	"
Benzo (a) pyrene	ND	0.0411	0.0833	"	"	"	"	"
Benzo (b) fluoranthene	ND	0.0411	0.0833	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.0411	0.0833	"	"	"	"	"
Chrysene	ND	0.0411	0.0833	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.0411	0.0833	"	"	"	"	"
Fluoranthene	ND	0.0411	0.0833	"	"	"	"	"
Fluorene	ND	0.0411	0.0833	"	"	"	"	"

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**MCC24-3 SS01@4'**  
**1/14/2025 12:05:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Enthalpy Analytical**  
**E5A0391-01 (Soil)**

**PAH by SW8270**

Indeno (1,2,3-cd) pyrene	ND	0.0411	0.0833	mg/kg	1	BIA0797	01/22/2025	01/22/2025	
Naphthalene	ND	0.00188	0.00380	"	"	"	"	"	"
Pyrene	ND	0.0411	0.0833	"	"	"	"	"	"

Surrogate: 2,4,6-Tribromophenol (Surr)	56.8 %		15-96			"	"	"	
Surrogate: 2-Fluorobiphenyl (Surr)	32.4 %		19-105			"	"	"	
Surrogate: 2-Fluorophenol (Surr)	22.9 %		12-95			"	"	"	
Surrogate: Nitrobenzene-d5 (Surr)	43.0 %		21-100			"	"	"	
Surrogate: Phenol-d5 (Surr)	47.4 %		13-100			"	"	"	
Surrogate: p-Terphenyl-d14 (Surr)	40.0 %		25-125			"	"	"	

**pH in Soil by 9045D**

pH	<b>8.48</b>			pH Units	1	B5A2025	01/20/2025	01/22/2025	
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**SAR by 20B Saturated Paste**

SAR	<b>28.5</b>		0.0100	SAR	1	B5A2021	01/20/2025	01/22/2025	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	<b>1.10</b>		0.00500	mmhos/cm	1	B5A2025	01/20/2025	01/22/2025	
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**Table 915 metals by EPA 6020B**

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1/14/2025 12:05:00PM

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
E5A0391-01 (Soil)

**Table 915 metals by EPA 6020B**

Arsenic	5.34		0.262	mg/kg	10	B5A2003	01/20/2025	01/21/2025	
Barium	236		9.04	"	"	"	"	"	"
Cadmium	0.158		0.0904	"	"	"	"	"	"
Copper	12.0		9.04	"	"	"	"	"	"
Lead	11.1		0.904	"	"	"	"	"	"
Nickel	12.6		0.904	"	"	"	"	"	"
Selenium	ND		0.235	"	"	"	"	"	"
Silver	ND		0.0904	"	"	"	"	"	"
Zinc	48.0		33.4	"	"	"	"	"	"

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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 B5A2001 - EPA 3550B</b>										
<b>Blank (B5A2001-BLK1)</b>										
					Prepared: 01/20/2025 Analyzed: 01/20/2025					
Diesel (C10-C28)	ND	25.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	100	"							U
Surrogate: o-Terphenyl	23		"	24.9		93.8	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 B5A2001 - EPA 3550B**

**LCS (B5A2001-BS1)**

Prepared: 01/20/2025 Analyzed: 01/20/2025

Diesel (C10-C28)	1020	50.0	mg/kg	1000		102	70-130			
Residual Range Organics (C28-C40)	1040	200	"	1000		104	70-130			
Surrogate: o-Terphenyl	43		"	49.8		87.3	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 B5A2001 - EPA 3550B</b>										
<b>Matrix Spike (B5A2001-MS1)</b>			<b>Source: E5A0349-01</b>			Prepared: 01/20/2025 Analyzed: 01/20/2025				
Diesel (C10-C28)	992	50.0	mg/kg	1000	ND	99.2	70-130			
Residual Range Organics (C28-C40)	1050	200	"	1000	ND	105	70-130			
Surrogate: o-Terphenyl	52		"	49.8		105	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 B5A2001 - EPA 3550B**

**Matrix Spike Dup (B5A2001-MSD1)**

**Source: E5A0349-01**

Prepared: 01/20/2025 Analyzed: 01/20/2025

Diesel (C10-C28)	976	50.0	mg/kg	1000	ND	97.6	70-130	1.59	35	
Residual Range Organics (C28-C40)	1030	200	"	1000	ND	103	70-130	2.68	35	
Surrogate: o-Terphenyl	53		"	49.8		107	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 B5A2111 - EPA 5030 (soil)**

**Blank (B5A2111-BLK1)**

Prepared: 01/21/2025 Analyzed: 01/21/2025

1,2,4-Trimethylbenzene	ND	0.00200	mg/kg							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
Benzene	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Toluene	ND	0.00200	"							U
Xylenes, total	ND	0.00200	"							U
Gasoline Range Hydrocarbons	ND	0.200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125	107		70-130			
Surrogate: Toluene-d8	0.12		"	0.125	99.8		70-130			
Surrogate: 4-Bromofluorobenzene	0.14		"	0.125	108		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 B5A2111 - EPA 5030 (soil)

LCS (B5A2111-BS1)

Prepared: 01/21/2025 Analyzed: 01/21/2025

1,2,4-Trimethylbenzene	0.0892	0.00200	mg/kg	0.100		89.2	70-130			
1,3,5-Trimethylbenzene	0.0902	0.00200	"	0.100		90.2	70-130			
Benzene	0.0934	0.00200	"	0.100		93.4	70-130			
Ethylbenzene	0.0842	0.00200	"	0.100		84.2	70-130			
Toluene	0.0907	0.00200	"	0.100		90.7	70-130			
o-Xylene	0.0875	0.00200	"	0.100		87.5	70-130			
m,p-Xylene	0.170	0.00400	"	0.200		85.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		107	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.3	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 B5A2111 - EPA 5030 (soil)**

**Matrix Spike (B5A2111-MS1)**

**Source: E5A0387-01**

Prepared: 01/21/2025 Analyzed: 01/21/2025

1,2,4-Trimethylbenzene	0.0783	0.00200	mg/kg	0.100	0.00124	77.1	70-130			
1,3,5-Trimethylbenzene	0.0781	0.00200	"	0.100	0.000500	77.6	70-130			
Benzene	0.0752	0.00200	"	0.100	ND	75.2	70-130			
Ethylbenzene	0.0761	0.00200	"	0.100	ND	76.1	70-130			
Toluene	0.0761	0.00200	"	0.100	ND	76.1	70-130			
o-Xylene	0.0773	0.00200	"	0.100	ND	77.3	70-130			
m,p-Xylene	0.153	0.00400	"	0.200	ND	76.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		98.3	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		100	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 B5A2111 - EPA 5030 (soil)

Matrix Spike Dup (B5A2111-MSD1)

Source: E5A0387-01

Prepared: 01/21/2025 Analyzed: 01/21/2025

1,2,4-Trimethylbenzene	0.0733	0.00200	mg/kg	0.100	0.00124	72.1	70-130	6.62	20	
1,3,5-Trimethylbenzene	0.0717	0.00200	"	0.100	0.000500	71.2	70-130	8.52	20	
Benzene	0.0753	0.00200	"	0.100	ND	75.3	70-130	0.106	20	
Ethylbenzene	0.0696	0.00200	"	0.100	ND	69.6	70-130	9.03	20	QM-07
Toluene	0.0733	0.00200	"	0.100	ND	73.3	70-130	3.72	20	
o-Xylene	0.0740	0.00200	"	0.100	ND	74.0	70-130	4.39	20	
m,p-Xylene	0.138	0.00400	"	0.200	ND	69.2	70-130	9.72	20	QM-07
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		107	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		99.3	70-130			

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Project: Citation Firr

**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 B5A2003 - EPA 3050B**

**Blank (B5A2003-BLK1)**

Prepared: 01/20/2025 Analyzed: 01/21/2025

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 (B5A2003-BS1)**

Prepared: 01/20/2025 Analyzed: 01/21/2025

Arsenic	5.16	0.290	mg/kg	5.00		103	80-120			
Barium	507	10.0	"	500		101	80-120			
Cadmium	5.31	0.100	"	5.00		106	80-120			
Copper	52.5	10.0	"	50.0		105	80-120			
Lead	5.14	1.00	"	5.00		103	80-120			
Nickel	5.14	1.00	"	5.00		103	80-120			
Selenium	5.50	0.260	"	5.00		110	80-120			
Silver	5.30	0.100	"	5.00		106	80-120			
Zinc	49.1	37.0	"	50.0		98.1	80-120			

**Matrix Spike (B5A2003-MS1)**

Source: E5A0388-01

Prepared: 01/20/2025 Analyzed: 01/21/2025

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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 B5A2003 - EPA 3050B**

**Matrix Spike (B5A2003-MS1)**

**Source: E5A0388-01**

Prepared: 01/20/2025 Analyzed: 01/21/2025

Arsenic	7.25	0.258	mg/kg	4.46	3.41	86.2	75-125			
Barium	618	8.91	"	446	132	109	75-125			
Cadmium	4.80	0.0891	"	4.46	0.0469	107	75-125			
Copper	53.9	8.91	"	44.6	4.40	111	75-125			
Lead	8.80	0.891	"	4.46	5.70	69.7	75-125			QM-07
Nickel	10.3	0.891	"	4.46	4.20	137	75-125			QM-07
Selenium	4.61	0.232	"	4.46	0.154	100	75-125			
Silver	4.82	0.0891	"	4.46	ND	108	75-125			
Zinc	70.7	33.0	"	44.6	22.2	109	75-125			

**Matrix Spike Dup (B5A2003-MSD1)**

**Source: E5A0388-01**

Prepared: 01/20/2025 Analyzed: 01/21/2025

Arsenic	6.42	0.247	mg/kg	4.26	3.41	70.9	75-125	12.1	20	QM-07
Barium	501	8.51	"	426	132	86.8	75-125	20.8	20	QM-07, QR-DUP
Cadmium	4.58	0.0851	"	4.26	0.0469	107	75-125	4.65	20	
Copper	51.3	8.51	"	42.6	4.40	110	75-125	4.84	20	
Lead	7.80	0.851	"	4.26	5.70	49.3	75-125	12.1	20	QM-07
Nickel	8.61	0.851	"	4.26	4.20	104	75-125	18.0	20	
Selenium	4.64	0.221	"	4.26	0.154	105	75-125	0.562	20	
Silver	4.64	0.0851	"	4.26	ND	109	75-125	3.75	20	
Zinc	60.3	31.5	"	42.6	22.2	89.6	75-125	15.9	20	

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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 B5A2015 - DTPA Sorbitol Preparation**

**Blank (B5A2015-BLK1)**

Prepared: 01/20/2025 Analyzed: 01/21/2025

Boron ND 0.100 mg/L

**Duplicate (B5A2015-DUP1)**

**Source: E5A0330-01**

Prepared: 01/20/2025 Analyzed: 01/21/2025

Boron 0.197 0.101 mg/L 0.187 5.37 50

**Batch B5A2021 - Saturated Paste Metals**

**Blank (B5A2021-BLK1)**

Prepared: 01/20/2025 Analyzed: 01/22/2025

SAR ND 0.0100 SAR

Calcium PPM ND 10.0 mg/L

Magnesium PPM ND 10.0 "

Sodium PPM ND 10.0 "

**Duplicate (B5A2021-DUP1)**

**Source: E5A0387-01**

Prepared: 01/20/2025 Analyzed: 01/22/2025

Calcium PPM 547 10.0 mg/L 548 0.148 50

SAR ND 0.0100 SAR 4.61 200

Magnesium PPM 143 10.0 mg/L 141 1.48 50

Sodium PPM 473 10.0 " 467 1.29 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 B5A2025 - Saturated Paste pH/EC**

**Blank (B5A2025-BLK1)**

Prepared: 01/20/2025 Analyzed: 01/22/2025

Specific Conductance (EC) ND 0.00500 mmhos/cm

**Duplicate (B5A2025-DUP1)**

**Source: E5A0387-01**

Prepared: 01/20/2025 Analyzed: 01/22/2025

pH	7.85		pH Units	7.89		0.508	25
Specific Conductance (EC)	4.11	0.00500	mmhos/cm	4.15		0.946	25

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**PAH by SW8270 - Quality Control  
Enthalpy Analytical**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BIA0797 - SW3550C/EPA600-MS**

**Blank (BIA0797-BLK1)**

Prepared: 01/22/2025 Analyzed: 01/22/2025

1-Methylnaphthalene	ND	0.00600	mg/kg				-			
2-Methylnaphthalene	ND	0.0150	"				-			
Acenaphthene	ND	0.0833	"				-			
Anthracene	ND	0.0833	"				-			
Benzo (a) anthracene	ND	0.0110	"				-			
Benzo (a) pyrene	ND	0.0833	"				-			
Benzo (b) fluoranthene	ND	0.0833	"				-			
Benzo (k) fluoranthene	ND	0.0833	"				-			
Chrysene	ND	0.0833	"				-			
Dibenz (a,h) anthracene	ND	0.0833	"				-			
Fluoranthene	ND	0.0833	"				-			
Fluorene	ND	0.0833	"				-			
Indeno (1,2,3-cd) pyrene	ND	0.0833	"				-			
Naphthalene	ND	0.00380	"				-			
Pyrene	ND	0.0833	"				-			

Surrogate: 2,4,6-Tribromophenol (Surr)	1.86		"	3.33		55.9	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.835		"	1.67		50.1	19-105			
Surrogate: 2-Fluorophenol (Surr)	0.863		"	3.33		25.9	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.851		"	1.67		51.1	21-100			
Surrogate: Phenol-d5 (Surr)	1.89		"	3.33		56.8	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.821		"	1.67		49.2	25-125			

**LCS (BIA0797-BS1)**

Prepared: 01/22/2025 Analyzed: 01/22/2025

1-Methylnaphthalene	ND	0.0833	mg/kg				0-200			
2-Methylnaphthalene	ND	0.0833	"				70-130			
Acenaphthene	1.30	0.0833	"	1.67		78.2	24-110			
Anthracene	1.29	0.0833	"	1.67		77.7	25-117			

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**PAH by SW8270 - Quality Control  
Enthalpy Analytical**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BIA0797 - SW3550C/EPA600-MS**

**LCS (BIA0797-BS1)**

Prepared: 01/22/2025 Analyzed: 01/22/2025

Benzo (a) anthracene	1.28	0.0833	mg/kg	1.67		76.9	25-127			
Benzo (a) pyrene	1.30	0.0833	"	1.67		78.1	18-127			
Benzo (b) fluoranthene	1.40	0.0833	"	1.67		84.3	20-132			
Benzo (k) fluoranthene	1.17	0.0833	"	1.67		70.4	14-136			
Chrysene	1.34	0.0833	"	1.67		80.4	21-141			
Dibenz (a,h) anthracene	1.37	0.0833	"	1.67		82.2	10-142			
Fluoranthene	1.33	0.0833	"	1.67		79.9	19-138			
Fluorene	1.27	0.0833	"	1.67		76.2	25-114			
Indeno (1,2,3-cd) pyrene	1.25	0.0833	"	1.67		75.1	10-136			
Naphthalene	1.14	0.0833	"	1.67		68.4	18-109			
Pyrene	1.12	0.0833	"	1.67		67.1	17-159			
Surrogate: 2,4,6-Tribromophenol (Surr)	2.82		"	3.33		84.7	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	1.20		"	1.67		72.3	19-105			
Surrogate: 2-Fluorophenol (Surr)	1.17		"	3.33		35.2	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	1.12		"	1.67		67.5	21-100			
Surrogate: Phenol-d5 (Surr)	2.50		"	3.33		75.0	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	1.15		"	1.67		69.1	25-125			

**Matrix Spike (BIA0797-MS1)**

**Source: 25A1124-10**

Prepared: 01/22/2025 Analyzed: 01/22/2025

1-Methylnaphthalene	ND	0.0833	mg/kg		ND		0-200			
2-Methylnaphthalene	ND	0.0833	"		ND		70-130			
Acenaphthene	1.01	0.0833	"	1.66	ND	60.9	10-124			
Anthracene	1.13	0.0833	"	1.66	ND	67.9	10-143			
Benzo (a) anthracene	0.996	0.0833	"	1.66	ND	59.9	10-169			
Benzo (a) pyrene	1.08	0.0833	"	1.66	ND	65.1	10-149			
Benzo (b) fluoranthene	1.10	0.0833	"	1.66	ND	66.2	10-150			
Benzo (k) fluoranthene	1.02	0.0833	"	1.66	ND	61.2	10-211			

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**PAH by SW8270 - 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 BIA0797 - SW3550C/EPA600-MS**

**Matrix Spike (BIA0797-MS1)**

**Source: 25A1124-10**

Prepared: 01/22/2025 Analyzed: 01/22/2025

Chrysene	0.890	0.0833	mg/kg	1.66	ND	53.5	10-172			
Dibenz (a,h) anthracene	1.15	0.0833	"	1.66	ND	69.5	10-128			
Fluoranthene	1.03	0.0833	"	1.66	ND	62.0	10-271			
Fluorene	0.971	0.0833	"	1.66	ND	58.4	10-124			
Indeno (1,2,3-cd) pyrene	1.05	0.0833	"	1.66	ND	63.0	10-127			
Naphthalene	0.867	0.0833	"	1.66	ND	52.2	10-118			
Pyrene	0.824	0.0833	"	1.66	ND	49.6	10-212			
Surrogate: 2,4,6-Tribromophenol (Surr)	2.15		"	3.32		64.8	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.921		"	1.66		55.5	19-105			
Surrogate: 2-Fluorophenol (Surr)	0.842		"	3.32		25.3	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.899		"	1.66		54.1	21-100			
Surrogate: Phenol-d5 (Surr)	2.03		"	3.32		61.0	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.850		"	1.66		51.2	25-125			

**Matrix Spike Dup (BIA0797-MSD1)**

**Source: 25A1124-10**

Prepared: 01/22/2025 Analyzed: 01/22/2025

1-Methylnaphthalene	ND	0.0833	mg/kg		ND		0-200		20	
2-Methylnaphthalene	ND	0.0833	"		ND		70-130		20	
Acenaphthene	1.00	0.0833	"	1.66	ND	60.5	10-124	0.941	20	
Anthracene	1.05	0.0833	"	1.66	ND	63.3	10-143	7.36	20	
Benzo (a) anthracene	0.959	0.0833	"	1.66	ND	57.9	10-169	3.72	20	
Benzo (a) pyrene	1.02	0.0833	"	1.66	ND	61.9	10-149	5.39	20	
Benzo (b) fluoranthene	1.03	0.0833	"	1.66	ND	62.5	10-150	6.08	20	
Benzo (k) fluoranthene	0.973	0.0833	"	1.66	ND	58.8	10-211	4.42	20	
Chrysene	0.929	0.0833	"	1.66	ND	56.1	10-172	4.32	20	
Dibenz (a,h) anthracene	1.07	0.0833	"	1.66	ND	64.6	10-128	7.54	20	
Fluoranthene	0.984	0.0833	"	1.66	ND	59.5	10-271	4.47	20	
Fluorene	0.950	0.0833	"	1.66	ND	57.4	10-124	2.09	20	

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**PAH by SW8270 - Quality Control  
Enthalpy Analytical**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BIA0797 - SW3550C/EPA600-MS**

**Matrix Spike Dup (BIA0797-MSD1)**

**Source: 25A1124-10**

Prepared: 01/22/2025 Analyzed: 01/22/2025

Indeno (1,2,3-cd) pyrene	0.979	0.0833	mg/kg	1.66	ND	59.1	10-127	6.75	20	
Naphthalene	0.870	0.0833	"	1.66	ND	52.6	10-118	0.432	20	
Pyrene	0.905	0.0833	"	1.66	ND	54.6	10-212	9.34	20	
Surrogate: 2,4,6-Tribromophenol (Surr)	2.18		"	3.31		65.7	15-96			
Surrogate: 2-Fluorobiphenyl (Surr)	0.909		"	1.66		54.9	19-105			
Surrogate: 2-Fluorophenol (Surr)	0.942		"	3.31		28.5	12-95			
Surrogate: Nitrobenzene-d5 (Surr)	0.872		"	1.66		52.6	21-100			
Surrogate: Phenol-d5 (Surr)	1.96		"	3.31		59.3	13-100			
Surrogate: p-Terphenyl-d14 (Surr)	0.906		"	1.66		54.8	25-125			

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### Notes and Definitions

U Sample is Non-Detect.

QR-DUP RPD exceeds QC acceptance criteria, this indicates source sample is not homogenous.

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

P Duplicate analysis does not meet the acceptance criteria for precision

M Matrix spike recovery is outside established acceptance limits

L LCS recovery is outside of established acceptance limits

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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