



Ensolum

December 27, 2024

Jeremy Espinoza

11049 W 44th Avenue, Suite 103

Wheat Ridge CO 80033

Project Name - KMG - Pioneer 4-12

Project Number - 09A1417854

Attached are your analytical results for KMG - Pioneer 4-12 received by Origins Laboratory November 19, 2024. This project is associated with Origins project number E4K0577-01.

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

Ensolum  
 11049 W 44th Avenue, Suite 103  
 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NATIVE-BG01@3'	E4K0577-01	Soil	November 19, 2024 13:31	11/19/2024 17:00
NATIVE-BG01@6'	E4K0577-02	Soil	November 19, 2024 13:32	11/19/2024 17:00
NATIVE-BG02@3'	E4K0577-03	Soil	November 19, 2024 13:35	11/19/2024 17:00
NATIVE-BG02@6'	E4K0577-04	Soil	November 19, 2024 13:36	11/19/2024 17:00
NATIVE-BG03@3'	E4K0577-05	Soil	November 19, 2024 13:37	11/19/2024 17:00
NATIVE-BG03@6'	E4K0577-06	Soil	November 19, 2024 13:39	11/19/2024 17:00
NATIVE-BG04@3'	E4K0577-07	Soil	November 19, 2024 13:41	11/19/2024 17:00
NATIVE-BG04@6'	E4K0577-08	Soil	November 19, 2024 13:43	11/19/2024 17:00
NATIVE-BG05@3'	E4K0577-09	Soil	November 19, 2024 13:44	11/19/2024 17:00
NATIVE-BG05@6'	E4K0577-10	Soil	November 19, 2024 13:47	11/19/2024 17:00
NATIVE-BG06@3'	E4K0577-11	Soil	November 19, 2024 13:51	11/19/2024 17:00
NATIVE-BG06@6'	E4K0577-12	Soil	November 19, 2024 13:53	11/19/2024 17:00
B01(4-12)@6'	E4K0577-13	Soil	November 19, 2024 13:59	11/19/2024 17:00
WH01-RISER(4-12)@3'	E4K0577-14	Soil	November 19, 2024 16:02	11/19/2024 17:00

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01(4-12)@6'-V	E4K0577-15	Soil	November 19, 2024 16:00	11/19/2024 17:00
WH01-RISER(4-12)@3'-V	E4K0577-16	Soil	November 19, 2024 16:03	11/19/2024 17:00

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**ORIGINS LABORATORY**

Client: Ensolium

Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Email Address: KMGTEAM

Project Manager: J. Espinoza

Project Name: Pioneer 4-12 Wellhead

Project Number: 09A1417854

Collected By: JK

Invoice/Billing info: INITIAL

S=Soil | SO=Solid | O=Oil | A=Air | G=Gas | UNP=Unpres | HCl= Hydrochloric | HNO3=Nitric | H2SO4=Sulfuric | NaOH=Sodium Hydroxide

#	Sample ID	Date Sampled	Time Sampled	# of Containers	Matrix	Preservative	Analysis		Comments
							g/L	mg/L	
1	NATIVE-BE01e3'	11/9/24	1331	2	S	UNP.			
2	NATIVE-BE01e6'		1332						
3	NATIVE-BE02e3'		1335						
4	NATIVE-BE02e6'		1336						
5	NATIVE-BE03e3'		1337						
6	NATIVE-BE03e6'		1339						
7	NATIVE-BE04e3'		1341						
8	NATIVE-BE04e6'		1343						
9	NATIVE-BE05e3'		1344						
10	NATIVE-BE05e6'		1347						

Relinquished By: [Signature]

Date: 11/9/24

Time: 1701

Received By: WS

Date: 11/19/24

Time: 1700

Turnaround Time:  SAME DAY  24 Hr  48 Hr  72  Standard

1725 Ely Drive Denver, CO 80231 | 303.432.1222 | info@originslab.com | Received On Ice?  Yes  No

Origins Laboratory

*[Signature]*

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Ensolium  
 11049 W 44th Avenue, Suite 103  
 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

Page 2 of 2

ORIGINS WORK ORDER # **EUKOS77**

Client: Ensolium  
 Address: \_\_\_\_\_  
 Telephone Number: \_\_\_\_\_  
 Email Address: KING@ENSO

Project Manager: J. Espinoza  
 Project Name: Pioneer 4-12 Wellhead  
 Project Number: 09A1417854

Key: W=Water  
 GW=Groundwater  
 SW=Surface Water  
 WW=Waste Water  
 L=Liquid

Collected By: HK  
 Invoice/Billing Info: M. H. G.

S=Soil | SO=Solid | O=Oil | A=Air | G=Gas | UNP=Unpres | HCL=Hydrochloric | HNO3=Nitric | H2SO4=Sulfuric | NaOH=Sodium Hydroxide

#	Sample ID	Date Sampled	Time Sampled	# of Containers	Matrix	Preservative	Analysis		Comments
							Lead	Cadmium	
1	NATIVE-BE06-3'	11/19/24	1351	2	S	UNP	X		Lead added to BO(4-12)-V per Jeremy's email on 11/19/24 JB
2	NATIVE-BE06-6'		1353	2	S	UNP	X		
3	BO(4-12)-6'		1359	3	S	UNP	X		
4	WHOLE-RISER(4-12)2'		1602	1	S	UNP	X		
5	BO(4-12)-6'-V		1600	1	S	UNP	X		
6	WHOLE-RISER(4-12)-3'-V		1603	1	S	UNP	X		
7									
8									
9									
10									

Remunished By: [Signature] Date: 11/19/24 Time: 1701

Received By: WS Date: 11/19/24 Time: 1700

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_


Received By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Turnaround Time:  SAME DAY  24 Hr  48 Hr  72

Standard

Temp Received: 5.1 Received On Ice?  Yes  No

1725 Elk Place Denver, Co. 80211 | # 303.433.1322 | originslab.com | For Lab Sample Receiving Only

Origins Laboratory  


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Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: E4K0577

Client: Ensolum

Client Project ID: Pioneer 4-12 44

Checklist Completed by: JK/Coar

Shipped Via: HD

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

Date/time completed: 11/19/24

Airbill #: N/A

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

Cooler Number/Temperature: 1 5.1 °C / °C / °C (Describe) °C

Thermometer ID: T007

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"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH < 2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

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

Reviewed by (Project Manager): JK

Date/Time Reviewed: 11/19/24

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG01@3'**  
**11/19/2024 1:31:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-01 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.319		0.101	mg/L	1	B4K2013	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	20.2		0.499	meq/L	10	[CALC]	11/20/2024	11/22/2024	
Magnesium	6.11		0.823	"	"	"	"	"	
Sodium	15.3		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.75			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	4.21		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	3.56		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.64		0.272	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	49.9		9.39	"	"	"	"	"	
Cadmium	ND		0.0939	"	"	"	"	"	
Copper	ND		9.39	"	"	"	"	"	

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**NATIVE-BG01@3'**  
**11/19/2024 1:31:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-01 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.79		0.939	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	4.65		0.939	"	"	"	"	"	
Selenium	ND		0.244	"	"	"	"	"	
Silver	ND		0.0939	"	"	"	"	"	
Zinc	ND		34.7	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.138	0.344	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Origins Laboratory



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**NATIVE-BG01@6'**  
**11/19/2024 1:32:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-02 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.349		0.101	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	6.52		0.499	meq/L	10	[CALC]	11/20/2024	11/22/2024	
Magnesium	2.71		0.823	"	"	"	"	"	
Sodium	11.0		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.89			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	5.13		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	2.13		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.53		0.246	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	52.1		8.47	"	"	"	"	"	
Cadmium	ND		0.0847	"	"	"	"	"	
Copper	ND		8.47	"	"	"	"	"	

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**NATIVE-BG01@6'**  
**11/19/2024 1:32:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-02 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.41		0.847	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	4.05		0.847	"	"	"	"	"	
Selenium	ND		0.220	"	"	"	"	"	
Silver	ND		0.0847	"	"	"	"	"	
Zinc	ND		31.3	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.148	0.371	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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**NATIVE-BG02@3'**  
**11/19/2024 1:35:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-03 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.237		0.102	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	21.9		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	7.96		0.823	"	"	"	"	"	
Sodium	11.8		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.71			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	3.06		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	3.58		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.21		0.261	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	44.8		9.00	"	"	"	"	"	
Cadmium	ND		0.0900	"	"	"	"	"	
Copper	ND		9.00	"	"	"	"	"	

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**NATIVE-BG02@3'**  
**11/19/2024 1:35:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-03 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.23		0.900	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.57		0.900	"	"	"	"	"	
Selenium	ND		0.234	"	"	"	"	"	
Silver	ND		0.0900	"	"	"	"	"	
Zinc	ND		33.3	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.133	0.332	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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**NATIVE-BG02@6'**  
**11/19/2024 1:36:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-04 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.476		0.0999	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	6.90		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	4.31		0.823	"	"	"	"	"	
Sodium	13.7		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.86			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	5.81		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	2.60		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.80		0.281	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	53.5		9.70	"	"	"	"	"	
Cadmium	ND		0.0970	"	"	"	"	"	
Copper	ND		9.70	"	"	"	"	"	

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**NATIVE-BG02@6'**  
**11/19/2024 1:36:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-04 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	5.57		0.970	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	5.91		0.970	"	"	"	"	"	
Selenium	ND		0.252	"	"	"	"	"	
Silver	ND		0.0970	"	"	"	"	"	
Zinc	ND		35.9	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.113	0.283	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG03@3'**  
**11/19/2024 1:37:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-05 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.413		0.100	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	21.4		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	7.82		0.823	"	"	"	"	"	
Sodium	17.7		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.79			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	4.62		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	4.09		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.38		0.277	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	45.7		9.55	"	"	"	"	"	
Cadmium	ND		0.0955	"	"	"	"	"	
Copper	ND		9.55	"	"	"	"	"	

Origins Laboratory



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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG03@3'**  
**11/19/2024 1:37:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-05 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.37		0.955	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	4.06		0.955	"	"	"	"	"	
Selenium	ND		0.248	"	"	"	"	"	
Silver	ND		0.0955	"	"	"	"	"	
Zinc	ND		35.3	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.101	0.252	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG03@6'**  
**11/19/2024 1:39:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-06 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.774		0.0987	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	16.4		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	9.51		0.823	"	"	"	"	"	
Sodium	24.2		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.72			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	6.73		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	4.72		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	2.41		0.279	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	72.5		9.61	"	"	"	"	"	
Cadmium	0.0980		0.0961	"	"	"	"	"	
Copper	ND		9.61	"	"	"	"	"	

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG03@6'**  
**11/19/2024 1:39:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-06 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	7.36		0.961	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	7.87		0.961	"	"	"	"	"	
Selenium	ND		0.250	"	"	"	"	"	
Silver	ND		0.0961	"	"	"	"	"	
Zinc	37.3		35.6	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.119	0.298	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Project: KMG - Pioneer 4-12

**NATIVE-BG04@3'**  
**11/19/2024 1:41:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-07 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.194		0.100	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	5.87		0.499	meq/L	10	[CALC]	11/20/2024	11/22/2024	
Magnesium	1.81		0.823	"	"	"	"	"	
Sodium	12.0		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.95			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	6.11		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	1.97		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.10		0.275	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	28.2		9.48	"	"	"	"	"	
Cadmium	ND		0.0948	"	"	"	"	"	
Copper	ND		9.48	"	"	"	"	"	

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Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG04@3'**

**11/19/2024 1:41:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory  
E4K0577-07 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	3.73		0.948	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.25		0.948	"	"	"	"	"	
Selenium	ND		0.246	"	"	"	"	"	
Silver	ND		0.0948	"	"	"	"	"	
Zinc	ND		35.1	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.113	0.284	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Project: KMG - Pioneer 4-12

**NATIVE-BG04@6'**  
**11/19/2024 1:43:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-08 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.255		0.0999	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	9.63		0.499	meq/L	10	[CALC]	11/20/2024	11/22/2024	
Magnesium	3.38		0.823	"	"	"	"	"	
Sodium	11.3		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.59			pH Units	1	B4K2026	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	4.43		0.0100	SAR	1	B4K2020	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	2.23		0.00500	mmhos/cm	1	B4K2026	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.55		0.277	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	30.8		9.57	"	"	"	"	"	
Cadmium	ND		0.0957	"	"	"	"	"	
Copper	ND		9.57	"	"	"	"	"	

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG04@6'**  
**11/19/2024 1:43:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-08 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	3.99		0.957	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.57		0.957	"	"	"	"	"	
Selenium	ND		0.249	"	"	"	"	"	
Silver	ND		0.0957	"	"	"	"	"	
Zinc	ND		35.4	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.133	0.332	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Project: KMG - Pioneer 4-12

**NATIVE-BG05@3'**  
**11/19/2024 1:44:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-09 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.348		0.100	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	23.8		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	8.24		0.823	"	"	"	"	"	
Sodium	12.1		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.71			pH Units	1	B4K2028	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	3.01		0.0100	SAR	1	B4K2021	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	3.56		0.00500	mmhos/cm	1	B4K2028	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.30		0.256	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	40.7		8.83	"	"	"	"	"	
Cadmium	ND		0.0883	"	"	"	"	"	
Copper	ND		8.83	"	"	"	"	"	

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG05@3'**  
**11/19/2024 1:44:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-09 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.05		0.883	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.65		0.883	"	"	"	"	"	
Selenium	ND		0.230	"	"	"	"	"	
Silver	ND		0.0883	"	"	"	"	"	
Zinc	ND		32.7	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.156	0.391	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Jeremy Espinoza  
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Project: KMG - Pioneer 4-12

**NATIVE-BG05@6'**  
**11/19/2024 1:47:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-10 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.614		0.0984	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	24.0		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	9.21		0.823	"	"	"	"	"	
Sodium	15.5		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.86			pH Units	1	B4K2028	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	3.81		0.0100	SAR	1	B4K2021	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	4.12		0.00500	mmhos/cm	1	B4K2028	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.59		0.253	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	64.5		8.73	"	"	"	"	"	
Cadmium	ND		0.0873	"	"	"	"	"	
Copper	ND		8.73	"	"	"	"	"	

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Jeremy Espinoza  
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Project: KMG - Pioneer 4-12

**NATIVE-BG05@6'**  
**11/19/2024 1:47:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-10 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	4.87		0.873	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	4.94		0.873	"	"	"	"	"	
Selenium	ND		0.227	"	"	"	"	"	
Silver	ND		0.0873	"	"	"	"	"	
Zinc	ND		32.3	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.142	0.354	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Project: KMG - Pioneer 4-12

**NATIVE-BG06@3'**  
**11/19/2024 1:51:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-11 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.203		0.0998	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	12.8		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	3.51		0.823	"	"	"	"	"	
Sodium	9.99		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.94			pH Units	1	B4K2028	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	3.50		0.0100	SAR	1	B4K2021	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	2.39		0.00500	mmhos/cm	1	B4K2028	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.04		0.281	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	43.9		9.69	"	"	"	"	"	
Cadmium	ND		0.0969	"	"	"	"	"	
Copper	ND		9.69	"	"	"	"	"	

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG06@3'**  
**11/19/2024 1:51:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-11 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	3.80		0.969	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.19		0.969	"	"	"	"	"	
Selenium	ND		0.252	"	"	"	"	"	
Silver	ND		0.0969	"	"	"	"	"	
Zinc	ND		35.9	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.140	0.351	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Project: KMG - Pioneer 4-12

**NATIVE-BG06@6'**  
**11/19/2024 1:53:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-12 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.259		0.101	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**Metals by Saturated Paste by EPA 6010**

Calcium	11.7		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	5.14		0.823	"	"	"	"	"	
Sodium	12.7		0.435	"	"	"	"	"	

**pH in Soil by 9045D**

pH	7.95			pH Units	1	B4K2028	11/20/2024	11/21/2024	
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**SAR by 20B Saturated Paste**

SAR	4.36		0.0100	SAR	1	B4K2021	11/20/2024	11/21/2024	
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**Specific Conductance Mod. 9050A**

Specific Conductance (EC)	2.64		0.00500	mmhos/cm	1	B4K2028	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Arsenic	1.12		0.287	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	38.2		9.91	"	"	"	"	"	
Cadmium	ND		0.0991	"	"	"	"	"	
Copper	ND		9.91	"	"	"	"	"	

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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**NATIVE-BG06@6'**  
**11/19/2024 1:53:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-12 (Soil)**

**Table 915 metals by EPA 6020B**

Lead	3.35		0.991	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Nickel	3.12		0.991	"	"	"	"	"	
Selenium	ND		0.258	"	"	"	"	"	
Silver	ND		0.0991	"	"	"	"	"	
Zinc	ND		36.7	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.103	0.257	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**B01(4-12)@6'**

**11/19/2024 1:59:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory  
E4K0577-13 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.457		0.101	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4K1948	11/19/2024	11/20/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: o-Terphenyl	68.6 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4K1947	11/19/2024	11/20/2024	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	108 %		70-130			"	"	"	
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Ensolum  
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 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**B01(4-12)@6'**

**11/19/2024 1:59:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-13 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: Toluene-d8	99.7 %		70-130			B4K19 47	11/19/2024	11/20/2024	
Surrogate: 4-Bromofluorobenzene	121 %		70-130			"	"	"	

**Metals by Saturated Paste by EPA 6010**

Calcium	7.71		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	3.77		0.823	"	"	"	"	"	
Sodium	11.5		0.435	"	"	"	"	"	

**PAH by 8270E SIM**

1-Methylnaphthalene	ND	0.00121	0.00368	mg/kg dry	1	2712801	11/29/2024	11/29/2024	U
2-Methylnaphthalene	ND	0.00121	0.00368	"	"	"	"	"	U
Acenaphthene	ND	0.00121	0.00368	"	"	"	"	"	U
Acenaphthylene	ND	0.00121	0.00368	"	"	"	"	"	U
Anthracene	ND	0.00121	0.00368	"	"	"	"	"	U
Benzo(a)anthracene	0.0195	0.00121	0.00368	"	"	"	"	"	
Benzo(a)pyrene	0.0136	0.00121	0.00368	"	"	"	"	"	
Benzo(b)fluoranthene	0.0202	0.00121	0.00368	"	"	"	"	"	
Benzo(ghi)perylene	0.00773	0.00121	0.00368	"	"	"	"	"	
Benzo(k)fluoranthene	0.0125	0.00121	0.00368	"	"	"	"	"	
Chrysene	0.00478	0.00121	0.00368	"	"	"	"	"	
Dibenzo(a,h)anthracene	0.00478	0.00121	0.00368	"	"	"	"	"	

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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**B01(4-12)@6'**

**11/19/2024 1:59:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**GEL Laboratories, LLC**

**E4K0577-13 (Soil)**

**PAH by 8270E SIM**

Fluoranthene	0.0232	0.00121	0.00368	mg/kg dry	1	2712801	11/29/2024	11/29/2024	
Fluorene	ND	0.00121	0.00368	"	"	"	"	"	U
Indeno(1,2,3-cd)pyrene	0.0118	0.00121	0.00368	"	"	"	"	"	
Naphthalene	ND	0.00121	0.00368	"	"	"	"	"	U
Phenanthrene	0.00294	0.00121	0.00368	"	"	"	"	"	
Pyrene	0.0236	0.00121	0.00368	"	"	"	"	"	

Surrogate: 5-alpha-Androstane 88 % 22-135 " " "

**pH in Soil by 9045D**

pH 8.08 pH Units 1 B4K2028 11/20/2024 11/21/2024

**SAR by 20B Saturated Paste**

SAR 4.81 0.0100 SAR 1 B4K2021 11/20/2024 11/21/2024

**Specific Conductance Mod. 9050A**

Specific Conductance (EC) 2.60 0.00500 mmhos/cm 1 B4K2028 11/20/2024 11/21/2024

**Table 915 metals by EPA 6020B**

Arsenic 1.93 0.251 mg/kg 10 B4K1951 11/19/2024 11/20/2024

Origins Laboratory



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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**B01(4-12)@6'**

**11/19/2024 1:59:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-13 (Soil)**

**Table 915 metals by EPA 6020B**

Barium	71.3		8.64	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Cadmium	0.115		0.0864	"	"	"	"	"	
Copper	ND		8.64	"	"	"	"	"	
Lead	20.9		0.864	"	"	"	"	"	
Nickel	5.87		0.864	"	"	"	"	"	
Selenium	ND		0.225	"	"	"	"	"	
Silver	ND		0.0864	"	"	"	"	"	
Zinc	ND		32.0	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.132	0.330	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**WH01-RISER(4-12)@3'**  
**11/19/2024 4:02:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-14 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.131		0.0986	mg/L	1	B4K2014	11/20/2024	11/21/2024	
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**DRO/ORO by EPA 8015D**

Diesel (C10-C28)	ND		25.0	mg/kg	1	B4K1948	11/19/2024	11/20/2024	Ua
Residual Range Organics (C28-C40)	ND		100	"	"	"	"	"	Ua

Surrogate: <i>o</i> -Terphenyl	76.3 %		50-150			"	"	"	
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**GBTEX+TMBs by 8260D**

1,2,4-Trimethylbenzene	ND		0.00200	mg/kg	1	B4K1947	11/19/2024	11/20/2024	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	105 %		70-130			"	"	"	
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 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**WH01-RISER(4-12)@3'**

**11/19/2024 4:02:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-14 (Soil)**

**GBTEX+TMBs by 8260D**

Surrogate: Toluene-d8	98.8 %		70-130			B4K19 47	11/19/2024	11/20/2024	
Surrogate: 4-Bromofluorobenzene	121 %		70-130			"	"	"	

**Metals by Saturated Paste by EPA 6010**

Calcium	1.90		0.499	meq/L	10	[CALC]	11/20/2024	11/21/2024	
Magnesium	0.895		0.823	"	"	"	"	"	
Sodium	5.32		0.435	"	"	"	"	"	

**PAH by 8270E SIM**

1-Methylnaphthalene	ND	0.00116	0.00352	mg/kg dry	1	2712801	11/29/2024	11/29/2024	U
2-Methylnaphthalene	ND	0.00116	0.00352	"	"	"	"	"	U
Acenaphthene	ND	0.00116	0.00352	"	"	"	"	"	U
Acenaphthylene	ND	0.00116	0.00352	"	"	"	"	"	U
Anthracene	ND	0.00116	0.00352	"	"	"	"	"	U
Benzo(a)anthracene	ND	0.00116	0.00352	"	"	"	"	"	U
Benzo(a)pyrene	ND	0.00116	0.00352	"	"	"	"	"	U
Benzo(b)fluoranthene	ND	0.00116	0.00352	"	"	"	"	"	U
Benzo(ghi)perylene	ND	0.00116	0.00352	"	"	"	"	"	U
Benzo(k)fluoranthene	ND	0.00116	0.00352	"	"	"	"	"	U
Chrysene	ND	0.00116	0.00352	"	"	"	"	"	U

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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**WH01-RISER(4-12)@3'**

**11/19/2024 4:02:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**GEL Laboratories, LLC**

**E4K0577-14 (Soil)**

**PAH by 8270E SIM**

Dibenzo(a,h)anthracene	ND	0.00116	0.00352	mg/kg dry	1	2712801	11/29/2024	11/29/2024	U
Fluoranthene	ND	0.00116	0.00352	"	"	"	"	"	U
Fluorene	ND	0.00116	0.00352	"	"	"	"	"	U
Indeno(1,2,3-cd)pyrene	ND	0.00116	0.00352	"	"	"	"	"	U
Naphthalene	ND	0.00116	0.00352	"	"	"	"	"	U
Phenanthrene	ND	0.00116	0.00352	"	"	"	"	"	U
Pyrene	ND	0.00116	0.00352	"	"	"	"	"	U

Surrogate: 5-alpha-Androstane 87 % 22-135 " " "

**pH in Soil by 9045D**

pH 8.05 pH Units 1 B4K2028 11/20/2024 11/21/2024

**SAR by 20B Saturated Paste**

SAR 4.50 0.0100 SAR 1 B4K2021 11/20/2024 11/21/2024

**Specific Conductance Mod. 9050A**

Specific Conductance (EC) 0.976 0.00500 mmhos/cm 1 B4K2028 11/20/2024 11/21/2024

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11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**WH01-RISER(4-12)@3'**

**11/19/2024 4:02:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**

**E4K0577-14 (Soil)**

**Table 915 metals by EPA 6020B**

Arsenic	1.15		0.274	mg/kg	10	B4K1951	11/19/2024	11/20/2024	
Barium	29.7		9.45	"	"	"	"	"	
Cadmium	ND		0.0945	"	"	"	"	"	
Copper	ND		9.45	"	"	"	"	"	
Lead	3.59		0.945	"	"	"	"	"	
Nickel	2.91		0.945	"	"	"	"	"	
Selenium	ND		0.246	"	"	"	"	"	
Silver	ND		0.0945	"	"	"	"	"	
Zinc	ND		35.0	"	"	"	"	"	

**Total Metals by 7196A**

Hexavalent Chromium	ND	0.119	0.298	mg/kg dry	1	2722446	12/18/2024	12/23/2024	U
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Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**B01(4-12)@6'-V**

**11/19/2024 4:00:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-15 (Soil)**

**pH in Soil by 9045D**

pH	8.38			pH Units	1	B4K2031	11/20/2024	11/21/2024	
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**Table 915 metals by EPA 6020B**

Lead	34.8		0.858	mg/kg	10	B4L0244	12/02/2024	12/03/2024	
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Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**WH01-RISER(4-12)@3'-V**

**11/19/2024 4:03:00PM**

Analyte	Result	Min Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory**  
**E4K0577-16 (Soil)**

**pH in Soil by 9045D**

pH	7.89			pH Units	1	B4K2031	11/20/2024	11/21/2024	
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 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**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 B4K1947 - EPA 5030 (soil)

Blank (B4K1947-BLK1)

Prepared: 11/19/2024 Analyzed: 11/20/2024

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		96.3	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		107	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		94.3	70-130			

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**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 B4K1947 - EPA 5030 (soil)

**LCS (B4K1947-BS1)**

Prepared: 11/19/2024 Analyzed: 11/20/2024

1,2,4-Trimethylbenzene	0.112	0.00200	mg/kg	0.100		112	70-130			
1,3,5-Trimethylbenzene	0.116	0.00200	"	0.100		116	70-130			
Benzene	0.103	0.00200	"	0.100		103	70-130			
Ethylbenzene	0.118	0.00200	"	0.100		118	70-130			
Naphthalene	0.0998	0.00380	"	0.100		99.8	70-130			
Toluene	0.104	0.00200	"	0.100		104	70-130			
o-Xylene	0.115	0.00200	"	0.100		115	70-130			
m,p-Xylene	0.235	0.00400	"	0.200		117	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		92.4	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		105	70-130			

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Ensolum  
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 Wheat Ridge CO 80033

Jeremy Espinoza  
 Project Number: 09A1417854  
 Project: KMG - Pioneer 4-12

**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 B4K1947 - EPA 5030 (soil)

Matrix Spike (B4K1947-MS1)	Source: E4K0573-01			Prepared: 11/19/2024 Analyzed: 11/20/2024						
1,2,4-Trimethylbenzene	0.0935	0.00200	mg/kg	0.100	ND	93.5	70-130			
1,3,5-Trimethylbenzene	0.0960	0.00200	"	0.100	ND	96.0	70-130			
Benzene	0.0911	0.00200	"	0.100	ND	91.1	70-130			
Ethylbenzene	0.100	0.00200	"	0.100	ND	100	70-130			
Naphthalene	0.0868	0.00380	"	0.100	ND	86.8	70-130			
Toluene	0.0877	0.00200	"	0.100	ND	87.7	70-130			
o-Xylene	0.0993	0.00200	"	0.100	ND	99.3	70-130			
m,p-Xylene	0.199	0.00400	"	0.200	ND	99.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		97.4	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		106	70-130			

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Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**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 B4K1947 - EPA 5030 (soil)

Matrix Spike Dup (B4K1947-MSD1)	Source: E4K0573-01			Prepared: 11/19/2024 Analyzed: 11/20/2024						
1,2,4-Trimethylbenzene	0.0972	0.00200	mg/kg	0.100	ND	97.2	70-130	3.88	20	
1,3,5-Trimethylbenzene	0.0988	0.00200	"	0.100	ND	98.8	70-130	2.88	20	
Benzene	0.0926	0.00200	"	0.100	ND	92.6	70-130	1.63	20	
Ethylbenzene	0.102	0.00200	"	0.100	ND	102	70-130	2.33	20	
Naphthalene	ND	0.00380	"	0.100	ND		70-130		20	QM-07, Ua
Toluene	0.0903	0.00200	"	0.100	ND	90.3	70-130	2.90	20	
o-Xylene	0.102	0.00200	"	0.100	ND	102	70-130	2.51	20	
m,p-Xylene	0.205	0.00400	"	0.200	ND	102	70-130	2.80	20	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		100	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		106	70-130			

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 Project: KMG - Pioneer 4-12

**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
<b>Batch B4K1948 - EPA 3550B</b>										
<b>Blank (B4K1948-BLK1)</b>										
					Prepared: 11/19/2024 Analyzed: 11/19/2024					
Diesel (C10-C28)	ND	25.0	mg/kg							Ua
Residual Range Organics (C28-C40)	ND	100	"							Ua
Surrogate: o-Terphenyl	23		"	24.9		92.3	50-150			

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 Project: KMG - Pioneer 4-12

**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 B4K1948 - EPA 3550B</b>										
<b>LCS (B4K1948-BS1)</b>										
					Prepared: 11/19/2024 Analyzed: 11/19/2024					
Diesel (C10-C28)	986	50.0	mg/kg	1000		98.6	70-130			
Residual Range Organics (C28-C40)	1040	200	"	1000		104	70-130			
Surrogate: o-Terphenyl	50		"	49.8		100	50-150			

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Project: KMG - Pioneer 4-12

**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 B4K1948 - EPA 3550B**

<b>Matrix Spike (B4K1948-MS1)</b>	<b>Source: E4K0573-01</b>			<b>Prepared: 11/19/2024 Analyzed: 11/19/2024</b>						
Diesel (C10-C28)	907	50.0	mg/kg	1000	ND	90.7	70-130			
Residual Range Organics (C28-C40)	964	200	"	1000	ND	96.4	70-130			
<i>Surrogate: o-Terphenyl</i>	39		"	49.8		79.4	50-150			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B4K1948 - EPA 3550B

Matrix Spike Dup (B4K1948-MSD1)	Source: E4K0573-01			Prepared: 11/19/2024 Analyzed: 11/19/2024						
Diesel (C10-C28)	972	50.0	mg/kg	1000	ND	97.2	70-130	7.01	35	
Residual Range Organics (C28-C40)	1030	200	"	1000	ND	103	70-130	6.35	35	
Surrogate: o-Terphenyl	41		"	49.8		81.5	50-150			

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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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 B4K1951 - EPA 3050B**

**Blank (B4K1951-BLK1)**

Prepared: 11/19/2024 Analyzed: 11/20/2024

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

**LCS (B4K1951-BS1)**

Prepared: 11/19/2024 Analyzed: 11/20/2024

Arsenic	4.69	0.290	mg/kg	5.00		93.8	80-120			
Barium	538	10.0	"	500		108	80-120			
Cadmium	5.02	0.100	"	5.00		100	80-120			
Copper	46.1	10.0	"	50.0		92.2	80-120			
Lead	4.84	1.00	"	5.00		96.7	80-120			
Nickel	4.84	1.00	"	5.00		96.7	80-120			
Selenium	5.42	0.260	"	5.00		108	80-120			
Silver	5.38	0.100	"	5.00		108	80-120			
Zinc	47.0	37.0	"	50.0		94.0	80-120			

**Matrix Spike (B4K1951-MS1)**

Source: E4K0577-01

Prepared: 11/19/2024 Analyzed: 11/20/2024

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 Project: KMG - Pioneer 4-12

**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 B4K1951 - EPA 3050B**

Matrix Spike (B4K1951-MS1)	Source: E4K0577-01			Prepared: 11/19/2024 Analyzed: 11/20/2024						
Arsenic	6.81	0.253	mg/kg	4.36	1.64	119	75-125			
Barium	564	8.72	"	436	49.9	118	75-125			
Cadmium	4.76	0.0872	"	4.36	0.0789	107	75-125			
Copper	47.3	8.72	"	43.6	4.38	98.4	75-125			
Lead	9.28	0.872	"	4.36	4.79	103	75-125			
Nickel	8.51	0.872	"	4.36	4.65	88.7	75-125			
Selenium	4.86	0.227	"	4.36	0.0854	110	75-125			
Silver	4.97	0.0872	"	4.36	0.0160	114	75-125			
Zinc	62.2	32.3	"	43.6	22.0	92.2	75-125			

Matrix Spike Dup (B4K1951-MSD1)	Source: E4K0577-01			Prepared: 11/19/2024 Analyzed: 11/20/2024						
Arsenic	5.85	0.271	mg/kg	4.68	1.64	90.1	75-125	15.1	20	
Barium	562	9.36	"	468	49.9	109	75-125	0.332	20	
Cadmium	4.81	0.0936	"	4.68	0.0789	101	75-125	1.07	20	
Copper	48.8	9.36	"	46.8	4.38	94.8	75-125	3.05	20	
Lead	8.93	0.936	"	4.68	4.79	88.6	75-125	3.85	20	
Nickel	8.57	0.936	"	4.68	4.65	83.8	75-125	0.661	20	
Selenium	5.15	0.243	"	4.68	0.0854	108	75-125	5.81	20	
Silver	5.10	0.0936	"	4.68	0.0160	109	75-125	2.58	20	
Zinc	62.6	34.6	"	46.8	22.0	86.9	75-125	0.741	20	

**Batch B4L0244 - EPA 3050B**

Blank (B4L0244-BLK1)	Prepared: 12/02/2024 Analyzed: 12/03/2024									
Arsenic	ND	0.290	mg/kg							
Barium	ND	10.0	"							
Cadmium	ND	0.100	"							

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Jeremy Espinoza  
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 Project: KMG - Pioneer 4-12

**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 B4L0244 - EPA 3050B**

**Blank (B4L0244-BLK1)**

Prepared: 12/02/2024 Analyzed: 12/03/2024

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

**LCS (B4L0244-BS1)**

Prepared: 12/02/2024 Analyzed: 12/03/2024

Arsenic	5.22	0.290	mg/kg	5.00		104	80-120			
Barium	554	10.0	"	500		111	80-120			
Cadmium	5.53	0.100	"	5.00		111	80-120			
Copper	53.4	10.0	"	50.0		107	80-120			
Lead	5.56	1.00	"	5.00		111	80-120			
Nickel	5.36	1.00	"	5.00		107	80-120			
Selenium	5.43	0.260	"	5.00		109	80-120			
Silver	5.67	0.100	"	5.00		113	80-120			
Zinc	53.0	37.0	"	50.0		106	80-120			

**Matrix Spike (B4L0244-MS1)**

**Source: E4L0017-01**

Prepared: 12/02/2024 Analyzed: 12/03/2024

Arsenic	8.99	0.242	mg/kg	4.18	4.90	98.0	75-125			
Barium	634	8.35	"	418	186	107	75-125			
Cadmium	4.60	0.0835	"	4.18	0.200	105	75-125			
Copper	60.9	8.35	"	41.8	14.5	111	75-125			
Lead	14.0	0.835	"	4.18	10.6	82.7	75-125			
Nickel	15.7	0.835	"	4.18	13.1	62.2	75-125			QM-07
Selenium	4.65	0.217	"	4.18	0.209	106	75-125			
Silver	4.51	0.0835	"	4.18	0.0475	107	75-125			

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 Project: KMG - Pioneer 4-12

**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
<b>Batch B4L0244 - EPA 3050B</b>										
<b>Matrix Spike (B4L0244-MS1)</b>			<b>Source: E4L0017-01</b>			Prepared: 12/02/2024 Analyzed: 12/03/2024				
Zinc	94.7	30.9	mg/kg	41.8	54.8	95.4	75-125			
<b>Matrix Spike Dup (B4L0244-MSD1)</b>			<b>Source: E4L0017-01</b>			Prepared: 12/02/2024 Analyzed: 12/03/2024				
Arsenic	8.46	0.247	mg/kg	4.26	4.90	83.6	75-125	6.06	20	
Barium	652	8.52	"	426	186	109	75-125	2.80	20	
Cadmium	4.90	0.0852	"	4.26	0.200	110	75-125	6.36	20	
Copper	58.4	8.52	"	42.6	14.5	103	75-125	4.10	20	
Lead	13.6	0.852	"	4.26	10.6	70.5	75-125	3.26	20	QM-07
Nickel	15.0	0.852	"	4.26	13.1	45.7	75-125	4.23	20	QM-07
Selenium	4.55	0.222	"	4.26	0.209	102	75-125	2.10	20	
Silver	4.79	0.0852	"	4.26	0.0475	111	75-125	6.22	20	
Zinc	109	31.5	"	42.6	54.8	128	75-125	14.5	20	QM-07

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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 B4K2013 - DTPA Sorbitol Preparation**

**Blank (B4K2013-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Boron ND 0.100 mg/L

**Duplicate (B4K2013-DUP1)**

**Source: E4K0575-04**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Boron 0.194 0.0981 mg/L 0.190 2.01 50

**Batch B4K2014 - DTPA Sorbitol Preparation**

**Blank (B4K2014-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Boron ND 0.100 mg/L

**Duplicate (B4K2014-DUP1)**

**Source: E4K0536-01**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Boron 0.373 0.0987 mg/L 0.275 30.4 50

**Batch B4K2020 - Saturated Paste Metals**

**Blank (B4K2020-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Calcium PPM ND 10.0 mg/L

SAR ND 0.0100 SAR

Magnesium PPM ND 10.0 mg/L

Sodium PPM ND 10.0 "

**Duplicate (B4K2020-DUP1)**

**Source: E4K0575-11**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Calcium PPM 29.0 10.0 mg/L 30.9 6.30 50

SAR ND 0.0100 SAR 5.02 200

Magnesium PPM 3.98 10.0 mg/L 3.46 14.0 50

Sodium PPM 118 10.0 " 110 6.44 50

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Project: KMG - Pioneer 4-12

**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 B4K2021 - Saturated Paste Metals**

**Blank (B4K2021-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/22/2024

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

**Duplicate (B4K2021-DUP1)**

**Source: E4K0543-01**

Prepared: 11/20/2024 Analyzed: 11/21/2024

SAR	ND	0.0100	SAR		6.31				200	
Calcium PPM	64.7	10.0	mg/L		44.9			36.0	50	
Magnesium PPM	19.7	10.0	"		18.7			5.42	50	
Sodium PPM	183	10.0	"		199			8.60	50	

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 Project: KMG - Pioneer 4-12

**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 B4K2026 - Saturated Paste pH/EC**

**Blank (B4K2026-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/21/2024

pH	0.00		pH Units							
Specific Conductance (EC)	ND	0.00500	mmhos/cm							

**Duplicate (B4K2026-DUP1)**

**Source: E4K0575-11**

Prepared: 11/20/2024 Analyzed: 11/21/2024

pH	9.73		pH Units		9.80			0.717	25	
Specific Conductance (EC)	0.919	0.00500	mmhos/cm		0.903			1.77	25	

**Batch B4K2028 - Saturated Paste pH/EC**

**Blank (B4K2028-BLK1)**

Prepared: 11/20/2024 Analyzed: 11/21/2024

Specific Conductance (EC)	ND	0.00500	mmhos/cm							
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**Duplicate (B4K2028-DUP1)**

**Source: E4K0543-01**

Prepared: 11/20/2024 Analyzed: 11/21/2024

pH	8.32		pH Units		8.35			0.360	25	
Specific Conductance (EC)	1.62	0.00500	mmhos/cm		1.58			2.42	25	

**Batch B4K2031 - Saturated Paste pH/EC**

**Duplicate (B4K2031-DUP1)**

**Source: E4K0556-01**

Prepared: 11/20/2024 Analyzed: 11/21/2024

pH	7.54		pH Units		7.47			0.933	25	
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 Project: KMG - Pioneer 4-12

**PAH by 8270E SIM - Quality Control**  
**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2712801 - SW846 3541**

**BLANK (1205933463-BLK)**

Prepared: 11/29/2024 Analyzed: 11/29/2024

Naphthalene	ND	0.00332	mg/kg				-			U
Benzo(k)fluoranthene	ND	0.00332	"				-			U
Pyrene	ND	0.00332	"				-			U
Indeno(1,2,3-cd)pyrene	ND	0.00332	"				-			U
Fluorene	ND	0.00332	"				-			U
Fluoranthene	ND	0.00332	"				-			U
Dibenzo(a,h)anthracene	ND	0.00332	"				-			U
Chrysene	ND	0.00332	"				-			U
1-Methylnaphthalene	ND	0.00332	"				-			U
Benzo(b)fluoranthene	ND	0.00332	"				-			U
2-Methylnaphthalene	ND	0.00332	"				-			U
Acenaphthene	ND	0.00332	"				-			U
Anthracene	ND	0.00332	"				-			U
Benzo(a)anthracene	ND	0.00332	"				-			U
Benzo(a)pyrene	ND	0.00332	"				-			U

*Surrogate: 5-alpha-Androstane*

0.144

"

0.166

86

22-135

**LCS (1205933464-BKS)**

Prepared: 11/29/2024 Analyzed: 11/29/2024

Benzo(b)fluoranthene	0.299	0.00329	mg/kg	0.329		91	39-123			
Benzo(k)fluoranthene	0.285	0.00329	"	0.329		87	40-122			
Naphthalene	0.261	0.00329	"	0.329		79	38-109			
Indeno(1,2,3-cd)pyrene	0.298	0.00329	"	0.329		90	38-133			
Fluorene	0.287	0.00329	"	0.329		87	37-115			
Fluoranthene	0.302	0.00329	"	0.329		92	39-119			
Dibenzo(a,h)anthracene	0.301	0.00329	"	0.329		91	38-132			
Pyrene	0.300	0.00329	"	0.329		91	38-117			
2-Methylnaphthalene	0.271	0.00329	"	0.329		82	39-110			

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Ensolum  
11049 W 44th Avenue, Suite 103  
Wheat Ridge CO 80033

Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

**PAH by 8270E SIM - Quality Control**  
**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2712801 - SW846 3541**

**LCS (1205933464-BKS)**

Prepared: 11/29/2024 Analyzed: 11/29/2024

Chrysene	0.281	0.00329	mg/kg	0.329		85	42-117			
1-Methylnaphthalene	0.266	0.00329	"	0.329		81	39-109			
Acenaphthene	0.276	0.00329	"	0.329		84	41-112			
Anthracene	0.297	0.00329	"	0.329		90	41-117			
Benzo(a)anthracene	0.305	0.00329	"	0.329		93	42-120			
Benzo(a)pyrene	0.309	0.00329	"	0.329		94	39-127			
Surrogate: 5-alpha-Androstane	0.150		"	0.165		91	22-135			

**LCSD (1205933465-BKSD)**

Prepared: 11/29/2024 Analyzed: 11/29/2024

Naphthalene	0.277	0.00329	mg/kg	0.329		84	38-109	6	30	
Benzo(k)fluoranthene	0.311	0.00329	"	0.329		94	40-122	9	30	
Indeno(1,2,3-cd)pyrene	0.320	0.00329	"	0.329		97	38-133	7	30	
Fluorene	0.306	0.00329	"	0.329		93	37-115	6	30	
Fluoranthene	0.318	0.00329	"	0.329		97	39-119	5	30	
Dibenzo(a,h)anthracene	0.321	0.00329	"	0.329		97	38-132	6	30	
Chrysene	0.297	0.00329	"	0.329		90	42-117	6	30	
Pyrene	0.316	0.00329	"	0.329		96	38-117	5	30	
1-Methylnaphthalene	0.285	0.00329	"	0.329		86	39-109	7	30	
Benzo(a)pyrene	0.330	0.00329	"	0.329		100	39-127	7	30	
Benzo(a)anthracene	0.322	0.00329	"	0.329		98	42-120	5	30	
Anthracene	0.313	0.00329	"	0.329		95	41-117	5	30	
Acenaphthene	0.295	0.00329	"	0.329		90	41-112	7	30	
2-Methylnaphthalene	0.290	0.00329	"	0.329		88	39-110	7	30	
Benzo(b)fluoranthene	0.323	0.00329	"	0.329		98	39-123	8	30	
Surrogate: 5-alpha-Androstane	0.177		"	0.165		108	22-135			

**MS (1205933466 S)**

Source: 696946001

Prepared: 11/29/2024 Analyzed: 11/29/2024

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**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2712801 - SW846 3541**

MS (1205933466 S)	Source: 696946001			Prepared: 11/29/2024 Analyzed: 11/29/2024						
Dibenzo(a,h)anthracene	0.117	0.00369	mg/kg dry	0.369	<0.00122	32	11-134			
Fluoranthene	0.120	0.00369	"	0.369	<0.00122	32	14-136			
Fluorene	0.109	0.00369	"	0.369	<0.00122	30	16-134			
Indeno(1,2,3-cd)pyrene	0.115	0.00369	"	0.369	<0.00122	31	13-134			
Chrysene	0.113	0.00369	"	0.369	<0.00122	31	19-129			
1-Methylnaphthalene	0.107	0.00369	"	0.369	0.00442	28	15-129			
Naphthalene	0.105	0.00369	"	0.369	<0.00122	29	16-126			
Pyrene	0.118	0.00369	"	0.369	0.00331	31	12-139			
2-Methylnaphthalene	0.110	0.00369	"	0.369	0.00699	28	15-132			
Benzo(b)fluoranthene	0.117	0.00369	"	0.369	<0.00122	32	14-136			
Benzo(a)pyrene	0.122	0.00369	"	0.369	<0.00122	33	16-133			
Benzo(a)anthracene	0.122	0.00369	"	0.369	<0.00122	33	20-132			
Anthracene	0.114	0.00369	"	0.369	<0.00122	31	18-136			
Acenaphthene	0.106	0.00369	"	0.369	<0.00122	29	17-129			
Benzo(k)fluoranthene	0.114	0.00369	"	0.369	<0.00122	31	18-138			

Surrogate: 5-alpha-Androstane      0.0646      "      0.185      0.113      35      22-135

MSD (1205933467 SD)	Source: 696946001			Prepared: 11/29/2024 Analyzed: 11/29/2024						
Dibenzo(a,h)anthracene	0.132	0.00362	mg/kg dry	0.362	<0.00119	37	11-134	12	30	
Fluoranthene	0.129	0.00362	"	0.362	<0.00119	36	14-136	8	30	
Fluorene	0.124	0.00362	"	0.362	<0.00119	34	16-134	13	30	
Indeno(1,2,3-cd)pyrene	0.129	0.00362	"	0.362	<0.00119	36	13-134	12	30	
Chrysene	0.123	0.00362	"	0.362	<0.00119	34	19-129	8	30	
Pyrene	0.129	0.00362	"	0.362	0.00331	35	12-139	9	30	
Benzo(a)pyrene	0.137	0.00362	"	0.362	<0.00119	38	16-133	11	30	
Naphthalene	0.116	0.00362	"	0.362	<0.00119	32	16-126	9	30	
1-Methylnaphthalene	0.118	0.00362	"	0.362	0.00442	31	15-129	10	30	

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**PAH by 8270E SIM - Quality Control**  
**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2712801 - SW846 3541

MSD (1205933467 SD)	Source: 696946001			Prepared: 11/29/2024 Analyzed: 11/29/2024						
Benzo(b)fluoranthene	0.131	0.00362	mg/kg dry	0.362	<0.00119	36	14-136	11	30	
Benzo(a)anthracene	0.131	0.00362	"	0.362	<0.00119	36	20-132	8	30	
Anthracene	0.128	0.00362	"	0.362	<0.00119	35	18-136	11	30	
Acenaphthene	0.120	0.00362	"	0.362	<0.00119	33	17-129	12	30	
2-Methylnaphthalene	0.120	0.00362	"	0.362	0.00699	31	15-132	9	30	
Benzo(k)fluoranthene	0.127	0.00362	"	0.362	<0.00119	35	18-138	11	30	
Surrogate: 5-alpha-Androstane	0.0705		"	0.181	0.113	39	22-135			

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Jeremy Espinoza  
Project Number: 09A1417854  
Project: KMG - Pioneer 4-12

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2722446 - SW846 3060A</b>										
<b>BLANK (1205953165-BLK)</b>					Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	ND	0.392	mg/kg				-			U
<b>LCS (1205953166-BKS)</b>					Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	4.02	0.400	mg/kg	4.00		101	80-120			
<b>DUP (1205953167 D)</b>					Source: E4K0577-01 Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	ND	0.331	mg/kg dry		<0.132		0-50	N/A	50	U
<b>MS (1205953168 S)</b>					Source: E4K0577-01 Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	3.25	0.398	mg/kg dry	3.98	<0.159	81.3	75-125			
<b>DUP (1205953169 D)</b>					Source: E4K0577-02 Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	ND	0.401	mg/kg dry		<0.160		0-50	N/A	50	U
<b>MS (1205953170 S)</b>					Source: E4K0577-02 Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	2.34	0.279	mg/kg dry	2.79	<0.112	83.3	75-125			
<b>ILCS (1205953171-ILCS)</b>					Prepared: 12/18/2024 Analyzed: 12/23/2024					
Hexavalent Chromium	8.30	0.396	mg/kg	8.03		103	80-120			

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**Notes and Definitions**

Ua Sample is Non-Detect.

U Result not detected above the detection limit

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

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported on a wet weight basis.

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