

# **FREMONT ENVIRONMENTAL INC.**

August 30, 2021

Mr. Mike Bohler  
Bohler Well Services Inc.  
2116 US Hwy 6  
Sterling, CO 80751

Subject:       **Wellhead Closure Data Submittal**  
Logan J Sand Unit (OWP) #4-24  
API # 05-075-60014  
SESE Section 1, 8N 54W, Meridian 6  
Logan County, Colorado  
Facility #221213, Remediation #18166

Dear Mr. Bohler:

As you requested, Fremont Environmental Inc. (Fremont) personnel conducted wellhead closure sampling tasks for the Logan J Sand Unit (OWP) #4-24 wellhead. Total petroleum hydrocarbons (TPH), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, TPH-DRO, TPH-ORO, Benzo (a) Anthracene, Benzo (a) Pyrene, Fluorene, 1-Methylnaphthalene, 2-Methylnaphthalene, Arsenic, Barium and Hexavalent Chromium were all observed in excess of the COGCC Table 915-1 Protection of Groundwater standards for soil; these soil impacts were left in place. The attached Closure Report details the abandonment work.

Please contact me at (303) 956-8714 if you require any additional information. Fremont appreciates the opportunity to provide this service.

Sincerely,

**FREMONT ENVIRONMENTAL INC.**



Paul V. Henehan, P.E.  
Senior Consultant

Attachments:

- Facility Closure Checklist
- Tables
- Figures
- Photos
- Laboratory Reports

**1759 REDWING LANE, BROOMFIELD, CO 80020**  
**(303) 956-8714 (DIRECT)**

Wellhead Closure Checklist						
COGCC Rule 911.a.(4) Environmental Site Closure Assessment Field Form						
Additional attachments (optional): <b>Photo Doc</b>		Pit Closure		Tank Battery Closure		Flowline Closure
Site Name & COGCC Facility Number: <b>Logan J Sand Unit (OWP)#4-24, 221213</b>		Date: <b>August 5, 2021</b>				Remediation Project #: <b>18166</b>
Associated Wells: <b>05-075-60014</b>		Age of Site: <b>Spud date- 1953</b>				Number of Photos Attached: <b>5</b>
Location: (GPS coordinates of wellhead or southeastern most wellhead for multiple) <b>(40.682788, -103.356853)</b>					Estimated Facility Size (acres):	
General Condition of Site: (General observations regarding housekeeping, corrosion, waste management, etc.) <b>Equipment remains on site, flow lines remain in site, visible staining and odor present.</b>						
USCS Soil Type: <b>SW</b>				Estimated Depth to Groundwater: <b>Not Encountered &gt;9'</b>		
Hydrocarbon Impacted Soils / Spills: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) <b>Heavy staining present in excavation walls on North, South and East sides. extends to &gt;9' bgs</b>						
Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) <b>None Observed</b>						
Wellhead(s)						
Well API	<b>05-075-60014</b>					
Age	<b>Spud date 1953</b>					
Condition of surface around wellhead	<b>excavated prior to arrival</b>					
PID Readings	<b>NM</b>					
Condition of subsurface (staining present)	<b>Staining/Odor</b>					
PID Readings	<b>530.2, 472.8, 506.7, 203.6, 143.6, 12.3</b>					
Sample taken? Location/Sample ID#	<b>yes /y108124-1 through y108124-4</b>					
Photo Number(s)	<b>1-5</b>					
Other observations regarding wellheads: <b>Equipment remains on site, heavy staining observed in subsurface, oily substance observed in soils. Extends to a depth greater than 9' bgs.</b>						
Summary						
Was impacted soil identified? No      Yes - less than 10 cubic yards <b>X</b> Yes - more than 10 cubic yards						
Total number of samples field screened: <b>6</b>				Total number of samples collected: <b>4</b>		
Highest PID Reading: <b>530.2 -Floor-9, 506.7 E-wall-3, 472.8 Floor-8</b>				Total number of samples submitted to lab for analysis: <b>4</b>		
If more than 10 cubic yards of impacted soil were observed:						
Vertical extent: <b>Extends &gt;9' bgs</b>				Estimated spill volume: <b>Unknown, historical</b>		
Lateral extent: <b>unknown, extends to north, south and east walls</b>				Volume of soil removed: <b>Left in place</b>		
Is additional investigation required? <b>Yes, vertical and lateral extent undefined</b>						
Was groundwater encountered during the investigation? <b>x</b> No      Yes - not impacted or in contact with impacted soils      Yes - groundwater impacted and/or in contact with impacted soils						
Measured depth to groundwater: <b>Not Encountered &gt;9'</b>				Was remedial groundwater removal conducted?      Yes <b>X</b> No		
Date Groundwater was encountered: <b>Not Encountered</b>				Commencement date of removal: <b>NA</b>		
Sheen on groundwater?      Yes <b>X</b> No				Volume of groundwater removed prior to sampling: <b>NA</b>		
Free product observed?      Yes <b>X</b> No				Volume of groundwater removed post sampling: <b>NA</b>		
Total number of samples collected: <b>NA</b>				Total Volume of groundwater removed: <b>NA</b>		
Total number of samples submitted to lab for analysis: <b>NA</b>						

TABLE 1  
SUMMARY OF ORGANIC (VOC AND TPH) SOIL CHEMISTRY DATA  
COLORADO OIL AND GAS CONSERVATION COMMISSION  
Logan J Sands Unit 4-24 (WELLHEAD), LOGAN COUNTY, COLORADO  
FREMONT PROJECT NO. C021-069

Sample	Depth (ft)	Date Sampled	Location	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- Benzene (mg/kg)	Xylenes (mg/kg)	1,2,4-Trimethyl- Benzene (mg/kg)	1,3,5-Trimethyl- Benzene (mg/kg)	Naphth- alene (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH ORO (mg/kg)
Floor-9	9	08/05/21	Floor	<0.002	<0.002	0.281	0.123	<b>0.0472</b>	<b>1.16</b>	<b>2.11</b>	309	<b>3250</b>	<b>2120</b>
Floor-8	8	08/05/21	Floor	<0.002	<0.002	0.588	0.34	<b>0.782</b>	<b>1.57</b>	<b>3.22</b>	281	<b>3860</b>	<b>2360</b>
E-Wall-3	3	08/05/21	East Wall	<0.002	<0.002	<0.002	<0.002	<0.002	0.00256	<b>2.24</b>	285	<b>6460</b>	<b>4200</b>
COGCC Table 915-1 Limits (Residential SSL)				1.2	490	5.8	58	30	27	2	500	500	500
COGCC Table 915-1 Limits (Protection of Groundwater SSL)				0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500	500	500

Bold faced values exceed the COGCC Table 915-1 concentrations

**TABLE 2**  
**SUMMARY OF INORGANIC SOIL CHEMISTRY DATA**  
**COLORADO OIL AND GAS CONSERVATION COMMISSION**  
**LOGAN J SAND UNIT 4-24 (WELLHEAD), LOGAN COUNTY, COLORADO**  
**FREMONT PROJECT NO. C021-069**

<b>SAMPLE LOCATION</b>	<b>DATE SAMPLED</b>	<b>DEPTH ft</b>	<b>EC mmhos/cm</b>	<b>pH pH units</b>	<b>SAR units</b>	<b>BORON mg/L</b>
BG-1	08/05/21	1	NA	NA	NA	0.623
E-Wall-3	08/05/21	3	0.89	7.61	2.45	0.3
Table 915-1 Limits			<4	6-8.3	<6	2

Bold face values exceed the COGCC Limits

TABLE 3  
SUMMARY OF POLYCYCLIC AROMATIC HYDROCARBONS (PAH) SOIL CHEMISTRY DATA  
COLORADO OIL AND GAS CONSERVATION COMMISSION  
LOGAN J SAND UNIT 4-24 (WELLHEAD), LOGAN COUNTY, COLORADO  
FREMONT PROJECT NO. C021-069

Sample	Depth (ft)	Date Sampled	Location	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo (a) anthracene (mg/kg)	Benzo (b) fluoranthene (mg/kg)	Benzo (k) fluoranthene (mg/kg)	Benzo (a) pyrene (mg/kg)	Chrysene (mg/kg)	Dibenz (a,h) anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	1-Methyl - naphthalene (mg/kg)	2-Methyl- naphthalene (mg/kg)	Pyrene (mg/kg)
E-Wall-3	3	08/05/21	East Wall	0.334	0.0516	<b>0.308</b>	0.201	0.0162	<b>0.308</b>	1.52	0.0648	0.136	<b>1.79</b>	0.0326	<b>8.61</b>	<b>7.66</b>	0.617
COGCC Table 915-1 Limits (Residential SSL)				360	1800	1.1	1.1	11	0.11	110	0.11	240	240	1.1	18	24	180
COGCC Table 915-1 Limits (Protection of Groundwater SSL)				0.55	5.8	0.011	0.3	2.9	0.24	9	0.096	8.9	0.54	0.98	0.006	0.019	1.3

Bold faced values exceed the COGCC Table 915-1 concentrations

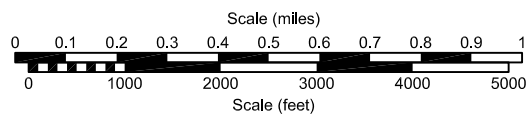
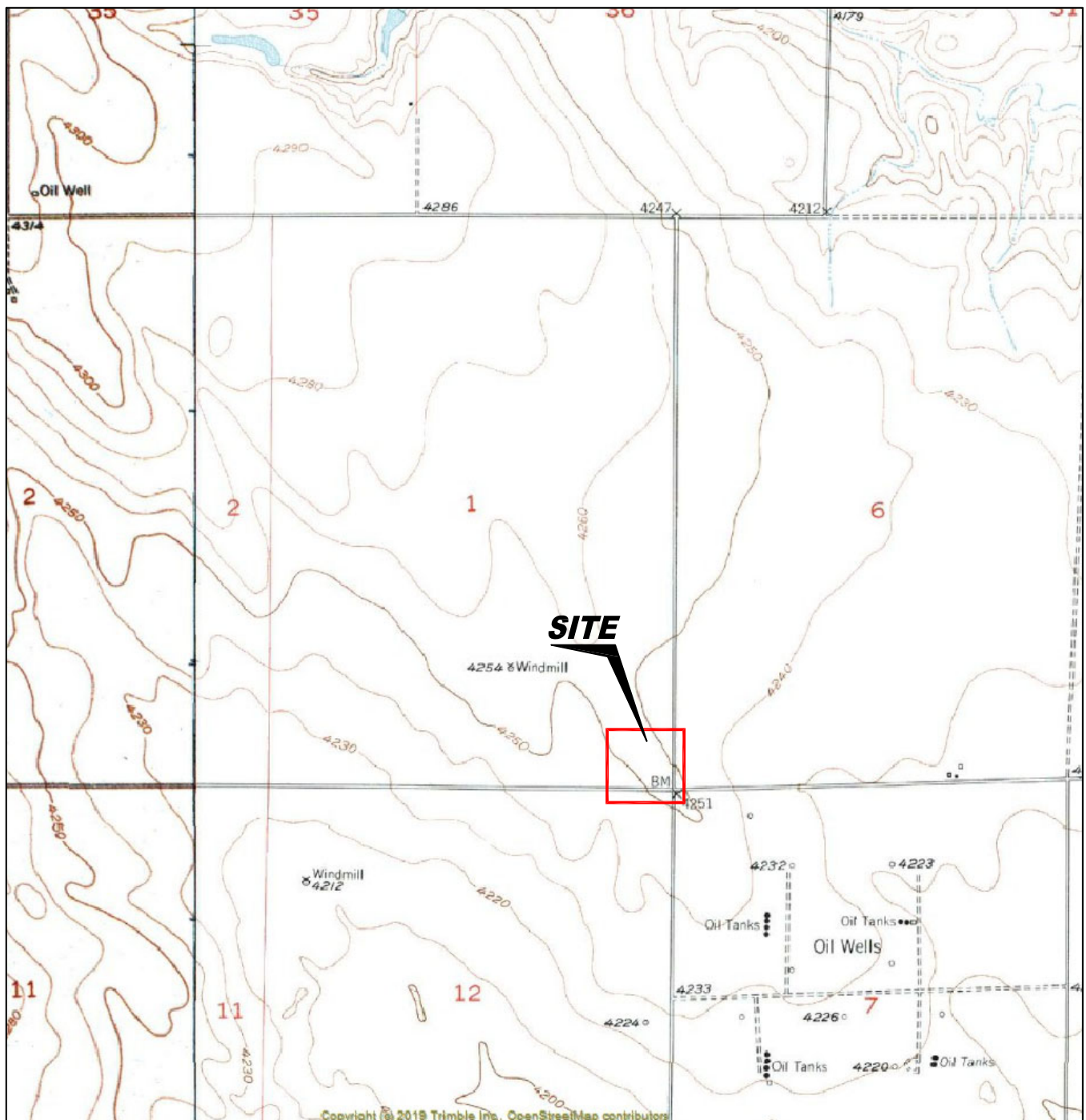
Blue highlighted 915-1 Limits indicate the referenced soil screening level (SSL)

TABLE 4  
SUMMARY OF METALS SOIL CHEMISTRY DATA  
COLORADO OIL AND GAS CONSERVATION COMMISSION  
LOGAN J SAND UNIT 4-24 (WELLHEAD), LOGAN COUNTY, COLORADO  
FREMONT PROJECT NO. C021-069

Sample	Depth (ft)	Date Sampled	Location	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)	Hexavalent Chromium (mg/kg)
BG-1	1	08/05/21	Background	<b>1.43</b>	NA	NA	NA	NA	NA	NA	NA	NA	NA
E-Wall-3	3	08/05/21	East Wall	<b>2.67</b>	<b>201</b>	0.126	8.83	10.4	10.5	0.24	0.0425	41	<b>&lt;2.50</b>
COGCC Table 915-1 Limits (Residential SSL)				0.68	15000	71	3100	400	1500	390	390	23000	0.3
COGCC Table 915-1 Limits (Protection of Groundwater SSL)				0.29	82	0.38	46	14	26	0.26	0.8	370	0.00067

Bold faced values exceed the COGCC Table 915-1 concentrations

Blue highlighted 915-1 Limits indicate the referenced soil screening level (SSL)



USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

**BOHLER WELL SERVICES**  
**Logan J Sand Unit 4-24**  
SESE Sec. 1, T8N, R54W, 6th PM  
Logan County, Colorado

Project # <b>C021-069</b>	API # <b>05-075-60014</b>	Facility # <b>221213</b>
Date <b>9/1/21</b>	Reviewed By <b>NL</b>	Filename <b>21069T</b>







#### LEGEND

●	WELLHEAD LOCATION
<span style="border: 1px solid green; padding: 2px;">BUILDING</span>	BUILDING
<span style="border: 1px dashed blue; padding: 2px;">FORMER</span>	FORMER FACILITY
—●—●—●—●—●—	FENCE LINE

Figure 2  
**SITE MAP**

**BOHLER WELL SERVICES**  
**Logan J Sand Unit 4-24**  
 SESE Sec. 1, T8N, R54W, 6th PM  
 Logan County, Colorado

Project No. <b>C021-069</b>	API # <b>05-075-60014</b>	Facility # <b>221213</b>
Date <b>9/1/21</b>	Reviewed By <b>NL</b>	Filename <b>21069Q</b>







# LEGEND

- WELLHEAD LOCATION
- SOIL SAMPLE LOCATION
- BUILDING
- BUILDING
- FORMER FACILITY
- FENCE LINE

08/05/2021	DATE SAMPLED	08/05/2021	DATE SAMPLED
E WALL ~ 3'	SAMPLE ID and DEPTH (ft)	FLOOR ~ 9'	SAMPLE ID and DEPTH (ft)
ACE	ACENAPHTHENE (mg/kg)	B	BENZENE (mg/kg)
Ant	ANTHRACENE (mg/kg)	T	TOLUENE (mg/kg)
BaA	BENZO (A) ANTHRACENE (mg/kg)	E	ETHYLBENZENE (mg/kg)
BaP	BENZO (B) FLUORANTHENE (mg/kg)	X	TOTAL XYLENES (mg/kg)
BaP	BENZO (K) FLUORANTHENE (mg/kg)	1,2,4-TB	1,2,4-TRIMETHYLBENZENE (mg/kg)
Chr	BENZO (A) PYRENE (mg/kg)	1,3,5-TB	1,3,5-TRIMETHYLBENZENE (mg/kg)
DBaHAnt	DIBENZ (A,H) ANTHRACENE (mg/kg)	N	NAPHTHALENE (mg/kg)
FLU	FLUORANTHENE (mg/kg)	G	TPH-GRO (mg/kg)
FL	FLUORENE (mg/kg)	D	TPH-ORO (mg/kg)
1,1,2,3,4-PY	INDENO (1,2,3-CD) PYRENE (mg/kg)	O	TPH-ORO (mg/kg)
1,4-IN	1-METHYLNAPHTHALENE (mg/kg)		
2,4-IN	2-METHYLNAPHTHALENE (mg/kg)		
PY	PYRENE (mg/kg)		

08/05/2021	DATE SAMPLED	08/05/2021	DATE SAMPLED
E WALL ~ 3'	SAMPLE ID and DEPTH (ft)	E WALL ~ 3'	SAMPLE ID and DEPTH (ft)
SAR	SAR (units)	As	ARSENIC (mg/kg)
pH	pH (pH units)	Ba	BARIUM (mg/kg)
EC	EC (mmhos/cm)	Co	CADMIUM (mg/kg)
B	BORON (mg/L)	Cu	COPPER (mg/kg)
		Ni	NICKEL (mg/kg)
		Se	SELENIUM (mg/kg)
		Ag	SILVER (mg/kg)
		Zn	ZINC (mg/kg)
		Cr(VI)	HEXAVALENT CHROMIUM (mg/kg)

Figure 3  
**SOIL CHEMISTRY MAP**  
August 5, 2021  
**BOHLER WELL SERVICES**  
Logan J Sand Unit 4-24  
SESE Sec. 1, T8N, R54W, 6th PM  
Logan County, Colorado

Project No. <b>C021-069</b>	API # <b>05-075-60014</b>	Facility # <b>221213</b>	
Date <b>9/2/21</b>	Reviewed By <b>NL</b>	Filename <b>21069QQ</b>	

1) Background sample location- Facing North



2) Wellhead -Facing East





3) Floor test pit- Floor-8 and Floor-9



4) Wellhead sample locations- Facing East



August 20, 2021

Fremont Environmental

Paul Henehan

8305 6th St, PO Box 1289

Wellington CO 80549

**Project Name - Logan J Sand Unit 4-24****Project Number - C021-069**

Attached are your analytical results for Logan J Sand Unit 4-24 received by Origins Laboratory, Inc. August 06, 2021. This project is associated with Origins project number Y108124-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



Fremont Environmental

8305 6th St, PO Box 1289

Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG-1	Y108124-01	Soil	August 5, 2021 12:35	08/06/2021 09:25
Floor-9	Y108124-02	Soil	August 5, 2021 12:55	08/06/2021 09:25
Floor-8	Y108124-03	Soil	August 5, 2021 12:45	08/06/2021 09:25
E-Wall-3	Y108124-04	Soil	August 5, 2021 13:05	08/06/2021 09:25

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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Fremont Environmental  
8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 1108124 Client: Fremont  
Client Project ID: Logan J Sand 4-24

Checklist Completed by: JS Shipped Via: MS  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)  
Date/time completed: 8/6/21 Airbill #: N/A

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: \_\_\_\_\_  
Cooler Number/Temperature: 1 14.0 °C 1 °C 1 °C (Describe) \_\_\_\_\_ °C  
Thermometer ID: 7003

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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input type="checkbox"/>	<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 type="checkbox"/>	<input type="checkbox"/>	<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: JS (Project Manager) Date/Time Reviewed: 8-4-21

Origins Laboratory, Inc.

*Jordan A. Merrill*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Fremont Environmental  
8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

**BG-1**

**8/5/2021 12:35:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y108124-01 (Soil)**

**Boron (DTPA Sorbitol)**

Boron	0.623	0.201	mg/L	1	B1H0909	JMA	08/09/2021	08/12/2021	
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**Total Metals by 6020B**

Arsenic	1.43	0.25	mg/Kg	5	L568078		08/09/2021	08/19/2021	
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Origins Laboratory, Inc.



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Fremont Environmental

8305 6th St, PO Box 1289

Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## Floor-9

8/5/2021 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y108124-02 (Soil)

### DRO/ORO by EPA 8015D

Diesel (C10-C28)	3250	50.0	mg/kg	1	B1H0628	DJL	08/06/2021	08/11/2021	
Residual Range Organics (C28-C40)	2120	200	"	"	"	DJL	"	"	

Surrogate: o-Terphenyl 123 % 50-150 " " "

### GBTEX+TMBs

1,2,4-Trimethylbenzene	0.0472	0.00200	mg/kg	1	B1H0627	KDK	08/06/2021	08/11/2021	
Naphthalene	2.11	0.250	"	25	"	KDK	"	08/13/2021	
1,3,5-Trimethylbenzene	1.16	0.0500	"	"	"	KDK	"	"	
Benzene	ND	0.00200	"	1	"	KDK	"	08/11/2021	U
Ethylbenzene	0.281	0.0500	"	25	"	KDK	"	08/13/2021	
Toluene	ND	0.00200	"	1	"	KDK	"	08/11/2021	U
Gasoline Range Hydrocarbons	309	5.00	"	25	"	KDK	"	08/13/2021	
Xylenes, total	0.123	0.00200	"	1	"	KDK	"	08/11/2021	

Surrogate: 1,2-Dichloroethane-d4 121 % 70-130 " " "

Surrogate: Toluene-d8 122 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 124 % 70-130 " " 08/13/2021

Origins Laboratory, Inc.



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Fremont Environmental

8305 6th St, PO Box 1289

Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## Floor-8

8/5/2021 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y108124-03 (Soil)

### DRO/ORO by EPA 8015D

Diesel (C10-C28)	3860	50.0	mg/kg	1	B1H0628	DJL	08/06/2021	08/11/2021	
Residual Range Organics (C28-C40)	2360	200	"	"	"	DJL	"	"	

Surrogate: o-Terphenyl 113 % 50-150 " " "

### GBTEX+TMBs

1,2,4-Trimethylbenzene	0.782	0.0500	mg/kg	25	B1H0627	KDK	08/06/2021	08/13/2021	
Naphthalene	3.22	0.250	"	"	"	KDK	"	"	
1,3,5-Trimethylbenzene	1.57	0.0500	"	"	"	KDK	"	"	
Benzene	ND	0.00200	"	1	"	KDK	"	08/11/2021	U
Ethylbenzene	0.588	0.0500	"	25	"	KDK	"	08/13/2021	
Toluene	ND	0.00200	"	1	"	KDK	"	08/11/2021	U
Gasoline Range Hydrocarbons	281	5.00	"	25	"	KDK	"	08/13/2021	
Xylenes, total	0.340	0.00200	"	1	"	KDK	"	08/11/2021	

Surrogate: 1,2-Dichloroethane-d4 120 % 70-130 " " "

Surrogate: Toluene-d8 118 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 127 % 70-130 " " 08/13/2021

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Fremont Environmental  
8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

## E-Wall-3

8/5/2021 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y108124-04 (Soil)

### Boron (DTPA Sorbitol)

Boron	0.300	0.200	mg/L	1	B1H0909	JMA	08/09/2021	08/12/2021	
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### DRO/ORO by EPA 8015D

Diesel (C10-C28)	6460	50.0	mg/kg	1	B1H0628	DJL	08/06/2021	08/11/2021	
Residual Range Organics (C28-C40)	4200	200	"	"	"	DJL	"	"	

Surrogate: o-Terphenyl	110 %	50-150			"	"	"	
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### GBTEX+TMBs

1,2,4-Trimethylbenzene	ND	0.00200	mg/kg	1	B1H0627	KDK	08/06/2021	08/11/2021	U
1,3,5-Trimethylbenzene	0.00256	0.00200	"	"	"	KDK	"	"	
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
Gasoline Range Hydrocarbons	285	5.00	"	25	"	KDK	"	08/13/2021	
Xylenes, total	ND	0.00200	"	1	"	KDK	"	08/11/2021	U

Surrogate: 1,2-Dichloroethane-d4	117 %	70-130			"	"	"	
Surrogate: Toluene-d8	102 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	154 %	70-130			"	"	"	S-04

### Metals by Saturated Paste

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Fremont Environmental

8305 6th St, PO Box 1289

Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## E-Wall-3

8/5/2021 1:05:00PM

Analyte	Result	Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc.

Y108124-04 (Soil)

### Metals by Saturated Paste

Calcium	3.18	0.0499	meq/L	1	[CALC]	CJM	08/09/2021	08/11/2021	
Magnesium	1.84	0.0823	"	"	"	CJM	"	"	
Sodium	3.87	0.0435	"	"	"	CJM	"	"	

### PAH by 8270D SIM

1-Methylnaphthalene	8.61	0.0134	mg/Kg	20	L568323		08/10/2021	08/10/2021	
2-Methylnaphthalene	7.66	0.0134	"	"	"		"	"	
Acenaphthene	0.334	0.0134	"	"	"		"	"	
Anthracene	0.0516	0.0134	"	"	"		"	"	
Benzo(a)anthracene	0.308	0.0134	"	"	"		"	"	
Benzo(a)pyrene	0.108	0.0134	"	"	"		"	"	
Benzo(b)fluoranthene	0.201	0.0134	"	"	"		"	"	
Benzo(k)fluoranthene	0.0162	0.0134	"	"	"		"	"	
Chrysene	1.52	0.0134	"	"	"		"	"	
Dibenz(a,h)anthracene	0.0648	0.0134	"	"	"		"	"	
Fluoranthene	0.136	0.0134	"	"	"		"	"	
Fluorene	1.79	0.0134	"	"	"		"	"	
Indeno(1,2,3-cd)pyrene	0.0326	0.0134	"	"	"		"	"	
Naphthalene	2.24	0.0134	"	"	"		"	"	
Pyrene	0.617	0.0134	"	"	"		"	"	

Surrogate: 2-Fluorobiphenyl

49.5 %

33-115

"

"

"

Surrogate: 4-Terphenyl-d14

67.4 %

33-122

"

"

"

Origins Laboratory, Inc.



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Fremont Environmental

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Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## E-Wall-3

8/5/2021 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Waypoint Analytical, Inc.

Y108124-04 (Soil)

### PAH by 8270D SIM

Surrogate: Nitrobenzene-d5	80.1 %	29-110			L5683 23	08/10/2021	08/10/2021
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### pH in Soil by EPA 9045D

pH	7.61	pH Units	1	B1H1009	DTP	08/10/2021	08/10/2021
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### SAR by 20B Saturated Paste

SAR	2.45	SAR	1	B1H0910	CJM	08/09/2021	08/11/2021
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### Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.890	0.00500	mmhos/cm	1	B1H1010	DJL	08/10/2021	08/10/2021
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### Total Metals by 6020B

Arsenic	2.67	0.25	mg/Kg	5	L568078	08/09/2021	08/19/2021
Barium	201	0.25	"	"	"	"	"
Cadmium	0.126	0.25	"	"	"	"	" J
Copper	8.83	0.25	"	"	"	"	"
Lead	10.4	0.25	"	"	"	"	"
Nickel	10.5	0.25	"	"	"	"	"
Selenium	0.24	0.25	"	"	"	"	" J
Silver	0.0425	0.25	"	"	"	"	" J
Zinc	41	2.5	"	"	"	"	"

Origins Laboratory, Inc.



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Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

E-Wall-3

8/5/2021 1:05:00PM

Analyte	Result	Reporting	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
		Limit							

Waypoint Analytical, Inc.  
Y108124-04 (Soil)

Total Metals by 7196A

Chromium, Hexavalent	ND	2.5	mg/Kg	5	L568706	08/05/2021	08/12/2021
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Origins Laboratory, Inc.



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Fremont Environmental  
8305 6th St, PO Box 1289  
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Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B1H0627 - EPA 5030 (soil)</b>										
<b>Blank (B1H0627-BLK1)</b>					Prepared: 08/06/2021 Analyzed: 08/09/2021					
1,2,4-Trimethylbenzene	ND	0.00200	mg/kg							U
Naphthalene	ND	0.0100	"							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
Benzene	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Toluene	ND	0.00200	"							U
Gasoline Range Hydrocarbons	ND	0.200	"							U
Xylenes, total	ND	0.00200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		100	70-130			

Origins Laboratory, Inc.



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Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B1H0627 - EPA 5030 (soil)</b>										
<b>LCS (B1H0627-BS1)</b>					Prepared: 08/06/2021 Analyzed: 08/09/2021					
1,2,4-Trimethylbenzene	0.0503	0.00200	mg/kg	0.0500		101	70-130			
Naphthalene	0.0440	0.0100	"	0.0500		88.0	70-130			
1,3,5-Trimethylbenzene	0.0487	0.00200	"	0.0500		97.3	70-130			
Benzene	0.0433	0.00200	"	0.0500		86.5	70-130			
Ethylbenzene	0.0481	0.00200	"	0.0500		96.2	70-130			
m,p-Xylene	0.103	0.00400	"	0.100		103	70-130			
o-Xylene	0.0484	0.00200	"	0.0500		96.9	70-130			
Toluene	0.0510	0.00200	"	0.0500		102	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		112	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		98.7	70-130			

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Paul Henehan  
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Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B1H0627 - EPA 5030 (soil)</b>										
<b>Matrix Spike (B1H0627-MS1)</b>		<b>Source: Y108107-01</b>			Prepared: 08/06/2021 Analyzed: 08/09/2021					
1,2,4-Trimethylbenzene	0.0575	0.00200	mg/kg	0.0500	0.00176	111	70-130			
Naphthalene	0.0383	0.0100	"	0.0500	0.00362	69.4	70-130			QM-07
1,3,5-Trimethylbenzene	0.0576	0.00200	"	0.0500	0.00110	113	70-130			
Benzene	0.0519	0.00200	"	0.0500	ND	104	70-130			
Ethylbenzene	0.0706	0.00200	"	0.0500	ND	141	70-130			QM-07
m,p-Xylene	0.145	0.00400	"	0.100	0.00124	143	70-130			QM-07
o-Xylene	0.0690	0.00200	"	0.0500	0.000720	137	70-130			QM-07
Toluene	0.0588	0.00200	"	0.0500	ND	118	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		103	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		106	70-130			
Surrogate: 4-Bromofluorobenzene	0.15		"	0.125		116	70-130			

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Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B1H0627 - EPA 5030 (soil)</b>										
<b>Matrix Spike Dup (B1H0627-MSD1)</b>		<b>Source: Y108107-01</b>			Prepared: 08/06/2021 Analyzed: 08/09/2021					
1,2,4-Trimethylbenzene	0.0529	0.00200	mg/kg	0.0500	0.00176	102	70-130	8.22	20	
Naphthalene	0.0489	0.0100	"	0.0500	0.00362	90.6	70-130	24.3	20	QR-03
1,3,5-Trimethylbenzene	0.0517	0.00200	"	0.0500	0.00110	101	70-130	10.7	20	
Benzene	0.0532	0.00200	"	0.0500	ND	106	70-130	2.51	20	
Ethylbenzene	0.0571	0.00200	"	0.0500	ND	114	70-130	21.2	20	QR-03
m,p-Xylene	0.119	0.00400	"	0.100	0.00124	118	70-130	19.5	20	
o-Xylene	0.0567	0.00200	"	0.0500	0.000720	112	70-130	19.6	20	
Toluene	0.0561	0.00200	"	0.0500	ND	112	70-130	4.66	20	
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		112	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		104	70-130			

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Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B1H0628 - EPA 3550B</b>										
<b>Blank (B1H0628-BLK1)</b>					Prepared: 08/06/2021 Analyzed: 08/11/2021					
Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	45		"	50.0		89.2	50-150			

Origins Laboratory, Inc.



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Project Number: C021-069  
Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B1H0628 - EPA 3550B

**LCS (B1H0628-BS1)**

Prepared: 08/06/2021 Analyzed: 08/11/2021

Diesel (C10-C28)	826	50.0	mg/kg	1000		82.6	70-130			
Residual Range Organics (C28-C40)	948	200	"	1000		94.8	70-130			
Surrogate: o-Terphenyl	45		"	50.0		89.0	50-150			

Origins Laboratory, Inc.



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Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B1H0628 - EPA 3550B**

Matrix Spike (B1H0628-MS1)		Source: Y108107-01			Prepared: 08/06/2021 Analyzed: 08/11/2021					
Diesel (C10-C28)	858	50.0	mg/kg	1000	201	65.7	70-130			QM-07
Residual Range Organics (C28-C40)	1010	200	"	1000	284	72.7	70-130			
Surrogate: o-Terphenyl	45		"	50.0		90.3	50-150			

Origins Laboratory, Inc.



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Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## Extractable Petroleum Hydrocarbons by 8015D - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B1H0628 - EPA 3550B

Matrix Spike Dup (B1H0628-MSD1)		Source: Y108107-01			Prepared: 08/06/2021 Analyzed: 08/11/2021					
Diesel (C10-C28)	870	50.0	mg/kg	1000	201	66.9	70-130	1.34	35	QM-07
Residual Range Organics (C28-C40)	1020	200	"	1000	284	73.5	70-130	0.854	35	
Surrogate: o-Terphenyl	45		"	50.0		90.1	50-150			

Origins Laboratory, Inc.



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Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

## Extractable Petroleum Hydrocarbons by 8015D - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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## Saturated Paste - Quality Control

### Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch B1H1009 - NO PREP

##### Duplicate (B1H1009-DUP1)

Source: Y108124-04

Prepared: 08/10/2021 Analyzed: 08/10/2021

pH	7.36	pH Units	7.61	3.34	25
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#### Batch B1H1010 - NO PREP

##### Blank (B1H1010-BLK1)

Prepared: 08/10/2021 Analyzed: 08/10/2021

Specific Conductance (EC)	0.00290	0.00500	mmhos/cm
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##### Duplicate (B1H1010-DUP1)

Source: Y108124-04

Prepared: 08/10/2021 Analyzed: 08/10/2021

Specific Conductance (EC)	0.964	0.00500	mmhos/cm	0.890	7.89	25
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Origins Laboratory, Inc.



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8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

**PAH by 8270D SIM - Quality Control**  
**Waypoint Analytical, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch L568323 - 3550B**

MSD (L 88007-MSD-L568323)		Source: 88007			Prepared: 08/10/2021 Analyzed: 08/10/2021					
Benzo(a)anthracene	0.131	0.000441	mg/Kg	0.166	88007	78.9	30-130	1.5	30	
Naphthalene	0.1	0.000467	"	0.166	88007	60.2	30-130	1.4	30	
Indeno(1,2,3-cd)pyrene	0.0733	0.000344	"	0.166	0.000476	44.1	30-130	9.3	30	
Fluorene	0.119	0.000501	"	0.166	88007	71.6	30-130	1.6	30	
Fluoranthene	0.129	0.000529	"	0.166	0.000816	77.2	30-130	0	30	
Dibenz(a,h)anthracene	0.0758	0.000279	"	0.166	88007	45.6	30-130	12.6	30	
Chrysene	0.128	0.000256	"	0.166	0.00079	76.6	30-130	0.7	30	
Benzo(b)fluoranthene	0.0959	0.000138	"	0.166	0.000739	57.3	30-130	0.1	30	
Acenaphthene	0.115	0.000431	"	0.166	88007	69.2	30-130	0	30	
2-Methylnaphthalene	0.103	0.000542	"	0.166	0.000921	61.4	30-130	1.9	30	
1-Methylnaphthalene	0.102	0.00048	"	0.166	0.000721	61	30-130	0	30	
Benzo(a)pyrene	0.118	0.000133	"	0.166	0.00067	70.6	30-130	1.6	30	
Benzo(k)fluoranthene	0.117	0.000486	"	0.166	88007	70.4	30-130	6.1	30	
Anthracene	0.126	0.000426	"	0.166	88007	75.9	30-130	2.3	30	
Pyrene	0.131	0.000387	"	0.166	0.000979	78.3	30-130	0.7	30	
Surrogate: Nitrobenzene-d5	61.6		"	0.331	194	61.6	29-110			
Surrogate: 4-Terphenyl-d14	74.9		"	0.331	235	74.9	33-122			
Surrogate: 2-Fluorobiphenyl	70.3		"	0.331	221	70.3	33-115			

MS (L 88007-MS-L568323)		Source: 88007			Prepared: 08/10/2021 Analyzed: 08/10/2021					
Naphthalene	0.0986	0.000467	mg/Kg	0.163	88007	60.4	30-130			
Pyrene	0.13	0.000387	"	0.163	0.000979	79.1	30-130			
Indeno(1,2,3-cd)pyrene	0.0805	0.000344	"	0.163	0.000476	49.3	30-130			
Fluorene	0.117	0.000501	"	0.163	88007	71.7	30-130			
Fluoranthene	0.129	0.000529	"	0.163	0.000816	78.6	30-130			
Dibenz(a,h)anthracene	0.086	0.000279	"	0.163	88007	52.7	30-130			
Chrysene	0.129	0.000256	"	0.163	0.00079	78.6	30-130			

Origins Laboratory, Inc.

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Fremont Environmental

8305 6th St, PO Box 1289

Wellington CO 80549

Paul Henehan

Project Number: C021-069

Project: Logan J Sand Unit 4-24

**PAH by 8270D SIM - Quality Control**  
**Waypoint Analytical, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch L568323 - 3550B**

MS (L 88007-MS-L568323)		Source: 88007			Prepared: 08/10/2021 Analyzed: 08/10/2021					
Benzo(k)fluoranthene	0.11	0.000486	mg/Kg	0.163	88007	67.4	30-130			
1-Methylnaphthalene	0.102	0.00048	"	0.163	0.000721	62.1	30-130			
Benzo(b)fluoranthene	0.0958	0.000138	"	0.163	0.000739	58.3	30-130			
Benzo(a)pyrene	0.12	0.000133	"	0.163	0.00067	73.2	30-130			
Benzo(a)anthracene	0.133	0.000441	"	0.163	88007	81.5	30-130			
Anthracene	0.129	0.000426	"	0.163	88007	79.1	30-130			
Acenaphthene	0.115	0.000431	"	0.163	88007	70.5	30-130			
2-Methylnaphthalene	0.101	0.000542	"	0.163	0.000921	61.3	30-130			
Surrogate: Nitrobenzene-d5	63.6		"	0.327	194	63.6	29-110			
Surrogate: 4-Terphenyl-d14	76.4		"	0.327	235	76.4	33-122			
Surrogate: 2-Fluorobiphenyl	77.3		"	0.327	221	77.3	33-115			

LCS (LCS-L568323)		Prepared: 08/10/2021 Analyzed: 08/10/2021								
Chrysene	0.123	0.000256	mg/Kg	0.167		73.6	30-130			
Naphthalene	0.0994	0.000467	"	0.167		59.5	30-130			
Benzo(b)fluoranthene	0.0931	0.000138	"	0.167		55.7	30-130			
Benzo(a)pyrene	0.116	0.000133	"	0.167		69.4	30-130			
Fluoranthene	0.127	0.000529	"	0.167		76	30-130			
Dibenz(a,h)anthracene	0.0902	0.000279	"	0.167		54	30-130			
2-Methylnaphthalene	0.104	0.000542	"	0.167		62.2	30-130			
Acenaphthene	0.116	0.000431	"	0.167		69.4	30-130			
Anthracene	0.126	0.000426	"	0.167		75.4	30-130			
1-Methylnaphthalene	0.104	0.00048	"	0.167		62.2	30-130			
Indeno(1,2,3-cd)pyrene	0.0848	0.000344	"	0.167		50.7	30-130			
Benzo(a)anthracene	0.127	0.000441	"	0.167		76	30-130			
Pyrene	0.124	0.000387	"	0.167		74.2	30-130			
Fluorene	0.117	0.000501	"	0.167		70	30-130			

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Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

**PAH by 8270D SIM - Quality Control**  
**Waypoint Analytical, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch L568323 - 3550B**

**LCS (LCS-L568323)**

Prepared: 08/10/2021 Analyzed: 08/10/2021

Benzo(k)fluoranthene	0.113	0.000486	mg/Kg	0.167		67.6	30-130			
Surrogate: 2-Fluorobiphenyl	79.2		"	0.333		79.2	33-115			
Surrogate: 4-Terphenyl-d14	77.1		"	0.333		77.1	33-122			
Surrogate: Nitrobenzene-d5	63.3		"	0.333		63.3	29-110			

**LRB (LRB-L568323)**

Prepared: 08/10/2021 Analyzed: 08/10/2021

Dibenz(a,h)anthracene	ND	0.00067	mg/Kg				-			
Pyrene	ND	0.00067	"				-			
Naphthalene	ND	0.00067	"				-			
2-Methylnaphthalene	ND	0.00067	"				-			
Acenaphthene	ND	0.00067	"				-			
Benzo(a)pyrene	ND	0.00067	"				-			
Anthracene	ND	0.00067	"				-			
Benzo(b)fluoranthene	ND	0.00067	"				-			
Chrysene	ND	0.00067	"				-			
Fluoranthene	ND	0.00067	"				-			
Fluorene	ND	0.00067	"				-			
Indeno(1,2,3-cd)pyrene	ND	0.00067	"				-			
Benzo(a)anthracene	ND	0.00067	"				-			
1-Methylnaphthalene	ND	0.00067	"				-			
Benzo(k)fluoranthene	ND	0.00067	"				-			
Surrogate: Nitrobenzene-d5	60		"	0.333		60	29-110			
Surrogate: 2-Fluorobiphenyl	69.3		"	0.333		69.3	33-115			
Surrogate: 4-Terphenyl-d14	66		"	0.333		66	33-122			

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Fremont Environmental  
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Project: Logan J Sand Unit 4-24

**Total Metals by 6020B - Quality Control**  
**Waypoint Analytical, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch L568078 - 3050B**

MSD (L 87712-MSD-L568078)			Source: 87712			Prepared: 08/09/2021 Analyzed: 08/19/2021				
Cadmium	0.813	0.0259	mg/Kg	0.497	0.356	92	75-125	6.6	80	
Copper	19.8	0.0806	"	2.48	17.5	93	75-125	7.3	80	
Lead	28.5	0.031	"	2.48	27.8	28	75-125	0.6	80	*
Nickel	9.95	0.0633	"	2.48	7.63	93	75-125	3.7	80	
Selenium	3.86	0.103	"	4.97	0.324	71	75-125	6.6	80	*
Silver	0.646	0.0067	"	0.497	0.223	130	75-125	4.1	80	*
Zinc	89.5	0.534	"	24.8	65.7	96	75-125	6.4	80	
Barium	104	0.042	"	4.97	107	NR	75-125	1.9	80	*
Arsenic	4.69	0.0855	"	2.48	2.84	75	75-125	5.7	80	

MS (L 87712-MS-L568078)			Source: 87712			Prepared: 08/09/2021 Analyzed: 08/19/2021				
Arsenic	4.43	0.0855	mg/Kg	2.36	2.84	67	75-125			*
Zinc	83.9	0.534	"	23.6	65.7	77	75-125			
Silver	0.62	0.0067	"	0.473	0.223	131	75-125			*
Selenium	3.61	0.103	"	4.73	0.324	70	75-125			*
Nickel	9.58	0.0633	"	2.36	7.63	83	75-125			
Lead	28.7	0.031	"	2.36	27.8	38	75-125			*
Copper	18.4	0.0806	"	2.36	17.5	38	75-125			*
Barium	106	0.042	"	4.73	107	NR	75-125			*
Cadmium	0.761	0.0259	"	0.473	0.356	86	75-125			

LCS (LCS-L568078)			Prepared: 08/09/2021 Analyzed: 08/19/2021							
Selenium	5.02	0.103	mg/Kg	5		100	80-120			
Silver	0.468	0.0067	"	0.5		94	80-120			
Arsenic	2.49	0.0855	"	2.5		100	80-120			
Barium	4.78	0.042	"	5		96	80-120			
Cadmium	0.459	0.0259	"	0.5		92	80-120			

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Paul Henehan  
Project Number: C021-069  
Project: Logan J Sand Unit 4-24

**Total Metals by 6020B - Quality Control**  
**Waypoint Analytical, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch L568078 - 3050B**

**LCS (LCS-L568078)**

Prepared: 08/09/2021 Analyzed: 08/19/2021

Copper	2.36	0.0806	mg/Kg	2.5	94	80-120
Lead	2.4	0.031	"	2.5	96	80-120
Zinc	23.8	0.534	"	25	95	80-120
Nickel	2.3	0.0633	"	2.5	92	80-120

**LRB (LRB-L568078)**

Prepared: 08/09/2021 Analyzed: 08/19/2021

Arsenic	ND	0.25	mg/Kg	-
Selenium	ND	0.25	"	-
Barium	ND	0.25	"	-
Cadmium	ND	0.25	"	-
Copper	ND	0.25	"	-
Lead	ND	0.25	"	-
Nickel	ND	0.25	"	-
Zinc	ND	2.5	"	-
Silver	ND	0.25	"	-

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## Total Metals by 7196A - Quality Control Waypoint Analytical, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch L568706 -</b>										
<b>DUP (L 87956-DUP)</b>		<b>Source: 87956</b>			Prepared: Analyzed: 08/12/2021					
Chromium, Hexavalent	ND	12.2	mg/Kg		87956	-		0	20	
<b>MS (L 87956-MS)</b>		<b>Source: 87956</b>			Prepared: Analyzed: 08/12/2021					
Chromium, Hexavalent	ND	12.2	mg/Kg	7.81	87956	0	75-125			*
<b>LCS (LCS)</b>					Prepared: Analyzed: 08/12/2021					
Chromium, Hexavalent	6.67	0.244	mg/Kg	8		83	75-125			
<b>LRB (LRB)</b>					Prepared: Analyzed: 08/12/2021					
Chromium, Hexavalent	ND	0.5	mg/Kg				-			

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Project Number: C021-069  
Project: Logan J Sand Unit 4-24

### Notes and Definitions

- U Sample is Non-Detect.
- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- J Estimated Value. Analyte below reported quantitation limit.
- \* QC Failure
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- All soil results are reported at a wet weight basis.

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