



Site Investigation Report

Arapaho Unit Section 25S Release

SESE, Section 25, T14S R42W
Arapaho SE 7.5 Minute Quadrangle

Arapaho Unit Section 25S Tank Battery
Cheyenne County, Colorado

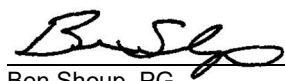
Prepared for:
Citation Oil & Gas Corp.
14077 Cutten Road
Houston, TX 77069

Prepared by:
Absaroka Energy and
Environmental Solutions, LLC.
Buffalo, WY 82834



CIT.CO.0555.01

October 2021



Ben Shoup, PG
Principal



Contents

1	INTRODUCTION	1
1.1	SITE DESCRIPTION AND LOCATION.....	1
1.2	CONTACT INFORMATION	2
1.3	HISTORIC LAND USE	2
1.4	HIGH PRIORITY HABITAT REVIEW	2
1.5	BACKGROUND – SPILL AND INITIAL RESPONSE	3
2	HYDROGEOLOGICAL CONDITIONS.....	3
2.1	GEOLOGY	3
2.2	SOIL	4
2.3	HYDROGEOLOGY.....	4
2.3.1	<i>Surface Water</i>	4
2.3.2	<i>Groundwater</i>	4
3	SOIL SAMPLING	5
3.1	METHODS	5
3.1.1	<i>Sampling Methodology</i>	5
3.1.2	<i>Sampling Equipment</i>	5
3.1.3	<i>Sample Analysis</i>	6
3.2	RELEASE DELINEATION SOIL SAMPLING	6
3.2.1	<i>Soil Impact Samples</i>	6
3.2.2	<i>Background Reference Samples</i>	6
4	SUMMARY OF RESULTS AND RECOMMENDATIONS	7
	REFERENCES.....	10

Tables

Table 1: Spill Volume Estimates.	1
Table 2: Location Information Regarding the Release and Flow Path.	2
Table 3: Contact Information.....	2
Table 4: Incident Chronology.	3
Table 5: Water Well Permits Within 1-mile Radius of Release Impacted Area.	4
Table 6: Summary of Soil Samples Collected.....	7
Table 7: Summary of soil sample results	8

Appendices

APPENDIX A – PROJECT LOCATION MAP
APPENDIX B – SOIL SAMPLE MAP, VERSION 1
APPENDIX C – SOIL SAMPLE MAP, VERSION 2
APPENDIX D – SOIL SAMPLE ANALYTICAL DATA
APPENDIX E – PHOTOLOG

1 INTRODUCTION

Citation Oil & Gas Corp. (Citation) contracted Absaroka Energy and Environmental Solutions, LLC (Absaroka) to conduct a site investigation, release delineation, and to prepare this Site Investigation Report for the Arapaho Unit Section 25S Tank Battery Release (July 10, 2021). The release initiated from an empty vertical heater treater falling and breaking a produced water flow line. The fall was caused by 65+ mph winds during the night between July 9 and July 10, 2021. Once the release was discovered, both associated production wells were shut down and associated casing and tubing valves were closed. A total of 130 bbls (barrels) of produced water were released. All fluids were contained within the earthen berm surrounding the treater vessels. The release impacted approximately 2090 square feet (0.048 acres) of surface area, all within containment. The affected lands are privately owned by Kathy Greenwald.

The following report outlines the details of the events subsequent to the incident, as well as site background, hydrogeology, surface and groundwater receptors, and remedial activities. Maps and other reference materials are also included.

Table 1: Spill Volume Estimates.

<i>Volume Released to Environment</i>	<i>Initial Volume Recovered</i>	<i>Initial Volume Unrecovered</i>
0 bbl crude oil	0 bbl crude oil	0 bbl crude oil
130 bbl produced water	130 bbl produced water	0 bbl produced water
0 mcf gas	0 mcf gas	0 mcf gas

1.1 Site Description and Location

The Arapaho Unit Section 25S Tank Battery release (Release) occurred in Citation's Arapaho Field, located approximately 20 miles east of Cheyenne Wells, within Cheyenne County, Colorado (**Appendix A**). A vertical heater treater fell, causing a produced water line to break. Produced water filled the containment area but never breached secondary containment berms. The extent of the release occurred within the SESE of Section 25, T14S R42W. The total area impacted by the produced water was approximately 2090 square feet (0.048 acres) (Site).

Arapahoe Unit Section 25S Release

Table 2: Location Information Regarding the Release.

<i>Feature</i>	<i>Land Survey</i>	<i>Coordinates (Lat/Lon; NAD 83)</i>
Release Origin	SESE, Section 25, T14S R42W	38.799248, -102.053487
Furthest Extent of Release	SESE, Section 25, T14S R42W	38.799115, -102.053398

The release location may be accessed by traveling east from Cheyenne Wells, Colorado along US-40 for approximately 17 miles to Cheyenne County Road 60, then turning south. Follow Cheyenne County Road 60 south for approximately four miles and the tank battery is located on the west side of Cheyenne County Road 60.

1.2 Contact Information

Pertinent contact information regarding the release and follow-up reporting are shown in Table 3.

Table 3: Contact Information.

<i>Contact</i>	<i>Person</i>	<i>Address</i>	<i>Phone No.</i>
Responsible Party	Citation Oil & Gas Corp.	14077 Cutten Road Houston, TX 77069	281-891-1000
Citation Director EHS/ Regulatory	Bob Redweik	14077 Cutten Road Houston, TX 77069	281-891-1550
Citation – Arapaho Field Foreman	Herschel Kennedy	15562 HWY 385, Cheyenne Wells, CO 80810	719-767-3401
Citation Environmental Contractor	Ben Shoup Absaroka Energy and Environmental Solutions, LLC	112 High Street Buffalo, WY 82834	855-684-5891
Landowner	Kathy Greenwald	PO Box 414 Niwtot, CO 80544	720-234-5615

1.3 Historic Land Use

The Site is located in a rural setting within the Great Plains physiographic province. Historic land use for the area includes agriculture and grazing of pastureland livestock. In addition, the land is currently being used for oil and gas production operations. Prior to oil and gas operations, the area had few uses aside from agriculture.

1.4 High Priority Habitat Review

The Colorado Parks and Wildlife (CPW) High Priority Habitat map overlay was reviewed, and the Site is not located within High Priority Habitat.

1.5 Background – Spill and Initial Response

The following summary table (Table 4) outlines the details of the events that immediately followed the release, including descriptions of the impacted area. A map of the impacted area can be found in **Appendices B and C**. This summary is based on best available data as provided by Citation personnel, and information documented by the Absaroka onsite responders.

Table 4: Incident Chronology.

<i>Date - Time</i>	<i>Event</i>
7/10/2021 – 08:00	Fluid release discovered. Shut in completed.
7/10/2021 – 11:30	Herschel Kennedy reports release to Jason Kosola of the COGCC
7/10/2021 – 11:31	Herschel Kennedy reports release to Lee Lanehart of Citation
7/11/2021	Clean-up crews arrived on site with vacuum truck and begin to recover released fluids.
7/12/2021	Form 19 Initial submitted
7/14/2021	Absaroka arrives onsite to delineate spill area and collect soil samples.
7/20/2021	Form 19 Supplemental submitted.

2 HYDROGEOLOGICAL CONDITIONS

2.1 Geology

The surface geology of the area is composed of Quaternary eolian deposits. These deposits overlie the Tertiary Pliocene and Upper Miocene Ogallala Formation which unconformably overlies the Late Cretaceous Pierre Shale. The Ogallala Formation is a semi-consolidated deposit of sand, silt, clay, gravel, chert and caliche. This formation consists of poorly sorted beds of cemented sandy silt, sand and gravel. The thickness of the formation ranges from 0 to 400 feet near the Kansas border with varying thicknesses due to changing topography within the formation. The Pierre Shale is described as a dark-gray and brownish clay shale containing calcareous and ferruginous concretions throughout, with some thick bentonite beds. (Arnold and Boettcher, 1964).

2.2 Soil

Surface soil texture at the Site is primarily sandy loam per field observations. Soil characteristics observed at the Site were compared to the Natural Resources Conservation Service's Web Soil Survey to determine soil type. Soils with the Site consist of one primary soil series, Keith-Ulysses silt loam. These soils occur on 1-4% hillslopes at elevations between 3,840 and 4,720 feet with a mean annual precipitation of 14 to 16 inches, mean annual air temperature of 50 to 54 degrees Fahrenheit, and a frost-free period of 130 to 170 days. The soils are silty loams and silty clay loams and are well drained. Typical water table depth is over 80 inches (NRCS, 2021).

2.3 Hydrogeology

2.3.1 Surface Water

An unnamed ephemeral drainage is located approximately 1,020 feet (0.19 miles) north of the release location. The closest body of water is the Neenoshe Reservoir located approximately 47 miles southeast of the release location. As indicated by field observations, no released fluid migrated outside of the earthen berm containment.

2.3.2 Groundwater

Depth to groundwater is estimated to be approximately 148 feet below ground surface (BGS). A water well record search identified that five (5) wells are located within 1.0 mile of the Site (Table 5) (CODWR, 2021).

Table 5: Water Well Permits Within 1-mile Radius of Release Impacted Area. Taken From CODWR (2021).

<i>Well Permit Number</i>	<i>Date Drilled</i>	<i>Applicant</i>	<i>Distance to Site (FT)</i>	<i>Static Water Depth (FT)</i>	<i>Well Depth (FT)</i>
278349	8/20/2008	State Board of Land Commissioners	3,263	246	430
544891	11/10/54	Harold B. Wells	2,504	148	291
4932-F	12/15/1963	Purvis Farms, Inc.	3,058	120	397
12342-F	12/31/1967	State Board of Land Commissioners	3,898	172	320
18109-FP	4/25/1974	Larry Hostetler	3,361	185	440

3 SOIL SAMPLING

3.1 Methods

3.1.1 Sampling Methodology

Absaroka collected soil samples to characterize the area impacted by the produced water and provide data pertaining to the extent of the fluid's impacts. Soil samples were collected using methods that are current with industry and regulatory standards. Photos of each soil sampling location is included in ***Appendix E***.

At each sampling location, a stainless-steel trowel was decontaminated using Alconox® solution, distilled water, and paper towels. The trowel was used to place samples into laboratory provided containers and the samples were then immediately placed on ice. The coordinates of the sample location were recorded. Photos were taken of the sampling location to show flow direction (upstream and downstream) and any other pertinent information. A chain of custody was then completed with the sample ID, date and time of collection, requested analyses, and pertinent account information. No preservative was used for the samples. The stainless-steel trowel was decontaminated using Alconox® solution, distilled water, and paper towels. Nitrile gloves were changed after the collection of each sample.

Samplers donned modified Level D personal protective equipment (PPE) consisting of flame resistant clothing, nitrile gloves, safety glasses, steel-toe boots, hard hat, and a 4-gas meter.

3.1.2 Sampling Equipment

Sampling equipment included the following:

- Gallon Ziploc® bags
- Quart Ziploc® bags
- Laboratory provided 4 oz jars
- Permanent marker
- Stainless-steel trowel
- Alconox® solution (in spray bottle)
- Distilled water (in spray bottle)
- Paper towels
- Camera
- GPS unit
- Laboratory chains of custody and shipping information

3.1.3 Sample Analysis

The day of collection of samples (7/14/21), a cooler containing the samples and the chain of custody was delivered to Summit Scientific, Inc. for analysis (see **Appendix D** – Laboratory Analytical Report):

Summit Scientific
4653 Table Mountain Drive
Golden, CO 80403

Each soil sample was analyzed for all COGCC Table 915-1 listed contaminants of concern.

Background samples were analyzed for the following parameters:

- Electric conductivity
- Sodium Adsorption Ratio (SAR)
- pH
- Boron
- Metals

3.2 Release Delineation Soil Sampling

A total of eight (8) soil grab samples were collected to identify and delineate soil impacts from the Release and compare them to background soil conditions (see **Appendices B and C**). All soil samples were collected on July 17, 2021. The sample locations and descriptions are summarized in Table 6.

3.2.1 Soil Impact Samples

Soil samples were collected from within the impacted area to identify the full extent of soil impacts. A total of eight (8) soil samples were collected within the impacted area. Samples were numbered moving from northwest to southwest, to northeast to southeast with CIT_AU_SS_04 being the closest sample to the release origin (see **Appendices B and C**).

3.2.2 Background Reference Samples

Three (3) background soil samples were collected for baseline reference and comparison of analysed parameters to the other soil samples. These samples were collected from nonimpacted soils adjacent to the Arapahoe Unit Section 25S location (see **Appendices B and C**).

Arapahoe Unit Section 25S Release

Table 6: Summary of Soil Samples Collected

<i>Sample ID</i>	<i>Latitude</i>	<i>Longitude</i>	<i>Sample Depth (In.)</i>	<i>Comment</i>
CIT_AU_BG_01	38.799296	-102.054050	0-3"	Sample collected offsite, northwest of pad
CIT_AU_BG_02	38.799432	-102.053499	0-3"	Sample collected offsite, north of pad
CIT_AU_BG_03	38.798063	-102.054561	0-3"	Sample collected offsite, southwest of pad
CIT_AU_SS_01	38.799366	-102.053462	0-3"	Sample collected in northwest area within containment
CIT_AU_SS_02	38.799215	-102.053449	0-3"	Sample collected in west-central area within containment
CIT_AU_SS_03	38.79918	-102.05343	0-3"	Sample collected in southwest area within containment
CIT_AU_SS_04	38.799248	-102.053487	0-3"	Sample collected near release origin
CIT_AU_SS_05	38.79921	-102.05341	0-3"	Sample collected in central area, near heater treater within containment
CIT_AU_SS_06	38.799273	-102.053416	0-3"	Sample collected in northeast area within containment
CIT_AU_SS_07	38.799211	-102.053438	0-3"	Sample collected in east-central area within containment
CIT_AU_SS_08	38.799115	-102.053398	0-3"	Sample collected in southeast area within containment

4 SUMMARY OF RESULTS AND RECOMMENDATIONS

Eight (8) soil samples were analyzed for all COGCC Table 915-1 listed contaminants of concern. The results of these analyses are summarized in Table 7. The laboratory analytical report, chains of custody, and quality assurance/quality control data is included in **Appendix D**.

Arapahoe Unit Section 25S Release

Table 7: Summary of soil sample results

Table 915-1			Arapaho Unit Section 25S Release										
CONCENTRATION LEVELS													
Organic Compounds in Soil			CIT_AU_ BG_01	CIT_AU_ BG_02	CIT_AU_ BG_03	CIT_AU_ SS_01	CIT_AU_ SS_02	CIT_AU_ SS_03	CIT_AU_ SS_04	CIT_AU_ SS_05	CIT_AU_ SS_06	CIT_AU_ SS_07	CIT_AU_ SS_08
TPH (GRO)	500	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
TPH (DRO)			NA	NA	NA	87	ND	ND	200	59	ND	ND	ND
TPH (ORO)			NA	NA	NA	ND	ND	ND	51	ND	ND	ND	ND
Benzene	1.2	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	490	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.8	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	58	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	30	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	27	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	360	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	1800	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Benz(A)anthracene	1.1	mg/kg	NA	NA	NA	ND	ND	ND	0.00550	ND	ND	ND	ND
Benzo(B)fluoranthene	1.1	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	0.00773	ND	ND
Benzo(K)fluoranthene	11	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(A)pyrene	0.11	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	110	mg/kg	NA	NA	NA	ND	ND	ND	ND	0.00970	ND	ND	ND
Dibenzo(A,H)anthracene	0.11	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	240	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	240	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3,C,D)pyrene	1.1	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylnapthalene	18	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnapthalene	24	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	2	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	180	mg/kg	NA	NA	NA	ND	ND	ND	ND	ND	0.00671	ND	ND
Inorganics and Metals in Soils													
Electrical Conductivity (EC)	<4.0	mmohs/c	0.383	1.58	1.07	29.7	26.3	30.8	11.1	28.4	33.0	27.4	26.2
Sodium Adsorption Ratio (SAR)	<6.0	NA	0.251	0.191	0.0987	48.8	51.3	45.3	26.3	54.5	58.0	51.7	41.9
pH	6.0-8.3	NA	8.02	7.70	7.18	7.70	7.81	7.76	7.96	7.75	7.78	7.79	7.83
Arsenic	0.68	mg/kg	4.48	2.13	3.71	3.49	3.61	3.89	10.6	4.10	2.54	3.51	3.33
Barium (total)	15,000	mg/kg	127	128	128	150	158	187	179	180	120	136	121
Boron (Hot Water Soluble)	2	mg/L	0.141	0.313	0.244	0.700	0.775	0.621	0.379	0.868	0.629	0.511	0.598
Cadmium	71	mg/kg	0.262	0.266	0.350	ND	ND	0.243	ND	0.345	ND	ND	ND
Chromium (VI)	0.3	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	3,100	mg/kg	57.5	8.98	31.3	10.0	8.51	9.97	28.4	28.4	8.14	9.02	7.15
Lead	400	mg/kg	22.0	8.48	14.0	7.13	7.60	8.59	17.1	9.67	5.83	7.21	5.85
Nickel	1,500	mg/kg	7.08	6.61	8.05	7.02	8.01	9.56	11.6	10.2	7.05	7.37	7.00
Selenium	390	mg/kg	1.51	0.0360	1.69	1.31	1.54	1.69	1.99	1.73	1.28	1.40	1.35
Silver	390	mg/kg	0.0800	33.9	0.0592	0.0374	0.0378	0.0456	0.0408	0.0461	0.0324	0.0334	0.0338
Zinc	2300	mg/kg	221	33.9	135	57.2	43.3	119	372	420	70.5	48.4	45.0

Arapahoe Unit Section 25S Release

Lab results indicate that all soil samples within the impacted area are above maximum contaminant levels (MCLs) for Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR) and Arsenic. EC results ranged from 11.1 - 33.0 mmohs/cm, significantly above the MCL of 4.0 mmohs/cm. SAR results ranged from 26.3 to 58.0, significantly above the MCL of 6.0. Arsenic results ranged from 2.54 - 10.6 mg/kg, with nearly all samples being consistent with background arsenic levels.

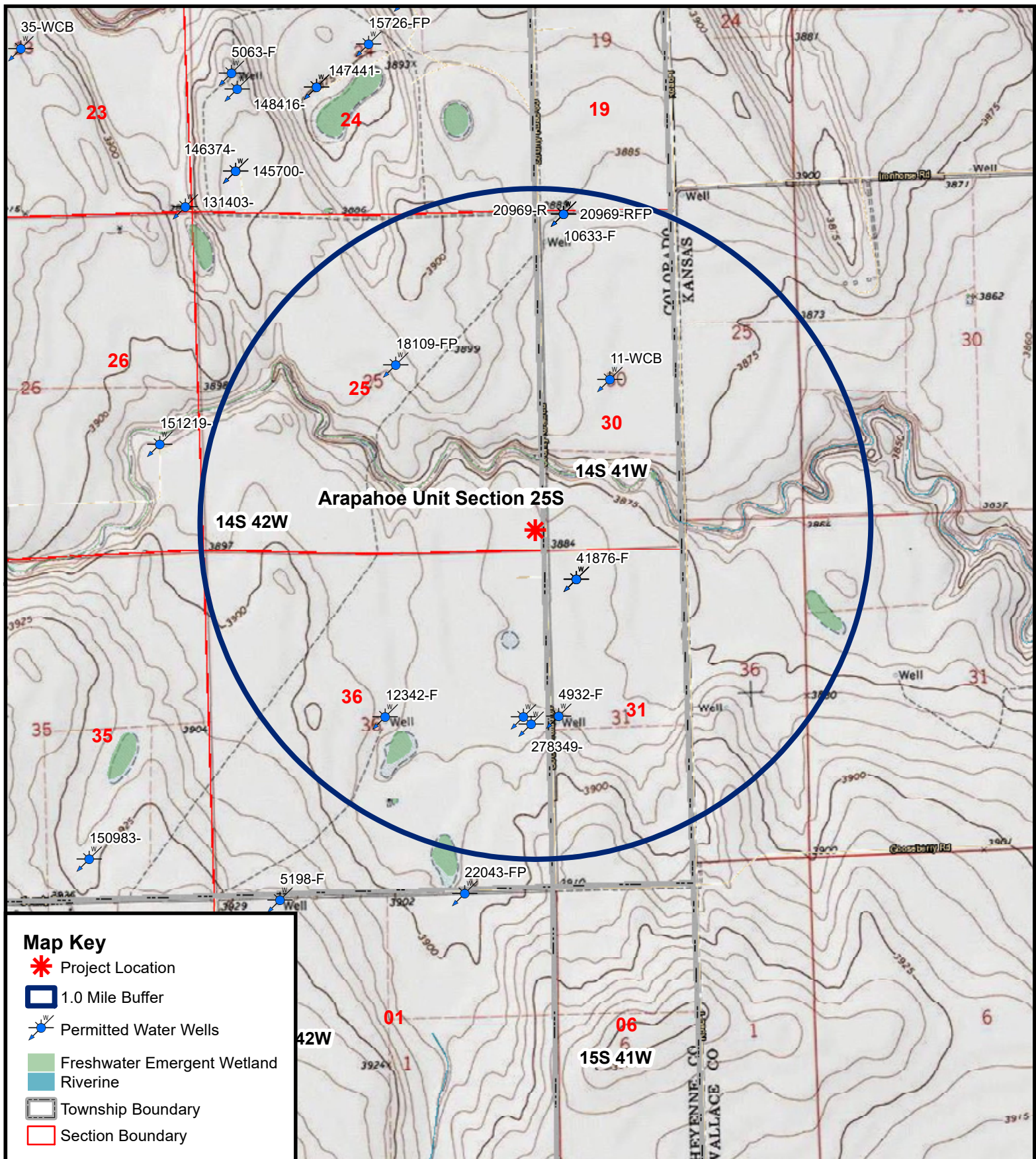
Absaroka recommends that these soils be removed from location and disposed at an appropriate waste facility. These impacts cannot feasibly be treated by in-situ methods. This document has been uploaded to the COGCC eForms via a Form 27 remediation workplan detailing the anticipated remediation actions and implementation dates.

References

- Arnold and Boettcher, 1964. Geology and Ground-Water Resources in Eastern Cheyenne and Kiowa Counties, Colorado. Colorado Water Conservation Board, Department of the Interior.
<https://pubs.usgs.gov/wsp/1779n/report.pdf>.
- NRCS, 2021. Soil Survey of Cheyenne County, Colorado. Version 8, Web Soil Survey, Natural Resources Conservation Service, U.S. Dept. of Agriculture,
<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Retrieved August 2021.
- USGS, 1979. Geologic Map of Colorado: U.S. Geological Survey Special Geologic Map, scale 1:500,000, by Tweto and Ogden, <https://mrdata.usgs.gov/geology/state/sgmc2-unit.php?unit=COKpu;0>. Retrieved August 2021.
- CODWR, 2021, Well Permit Search, Colorado Division of Water Resources,
<https://dwr.state.co.us/Tools/WellPermits/>. Retrieved August 2021.

APPENDICES

Appendix A – Project Location Map



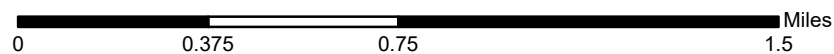
Arapahoe Unit Section 25S Release Location

Cheyenne County, State of Colorado

112 High Street
Buffalo, Wyoming 82834
855.684.5891

www.absarokasolutions.com

CIT.CO.0555.01



Coordinate System: WGS 1984 UTM Zone 13N



Date: 8/11/2021

Scale:1:24,000

Appendix B – Soil Sample Map, Version 1



Map Key

- ▲ Background Sample Locations
- ▲ Grab Sample Locations
- Surface Spill Area
- Township Boundary
- Section Boundary



112 High Street
Buffalo, Wyoming 82834
855.684.5891

www.absarokasolutions.com

CIT.CO.0555.01

Arapahoe Unit Section 25S Soil Sample Location Map

Cheyenne County, State of Colorado

0 65 130 260 Feet

Coordinate System: WGS 1984 UTM Zone 13N

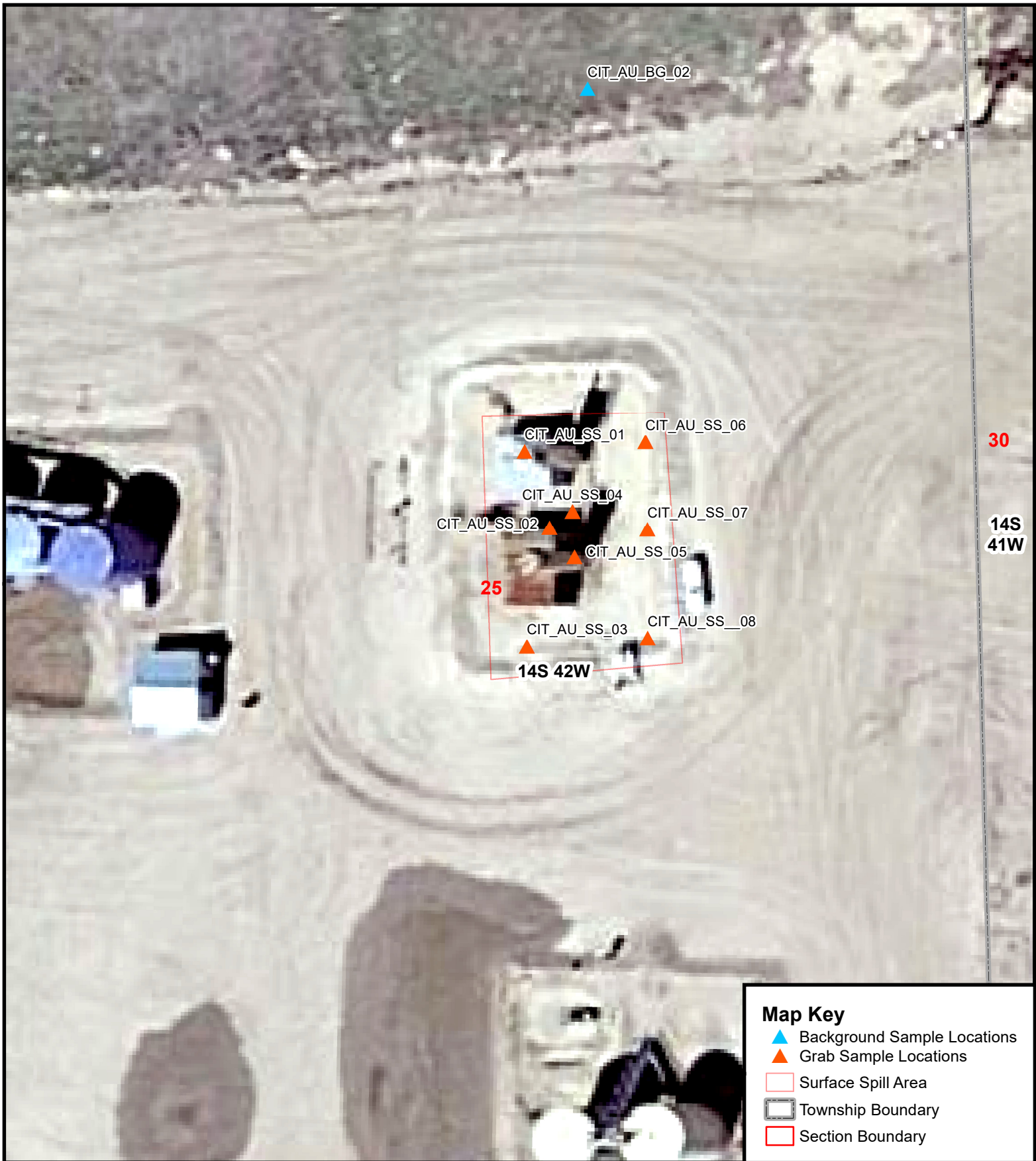
N

Citation
OIL & GAS CORP.

Date: 8/11/2021

Scale: 1:800

Appendix C – Soil Sample Map, Version 2



112 High Street
Buffalo, Wyoming 82834
855.684.5891

www.absarokasolutions.com

CIT.CO.0555.01

Arapahoe Unit Section 25S Soil Sample Location Map

Cheyenne County, State of Colorado

0 20 40 80 Feet

Coordinate System: WGS 1984 UTM Zone 13N



Citation
OIL & GAS CORP.

Date: 8/11/2021

Scale: 1:285

Appendix D – Soil Sample Analytical Data

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 26, 2021

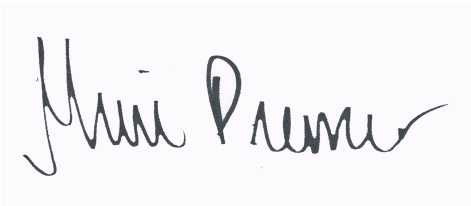
Ken Rogowski
Absaroka Solutions
112 High Street
Buffalo, WY 82834

RE: Arapahoe Unit Section 25S Spill Support

Work Order #2107227

Enclosed are the results of analyses for samples received by Summit Scientific on 07/15/21 16:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Muri Premier", is displayed on a light purple rectangular background.

Muri Premier For Paul Shrewsbury
President



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support

Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
CIG_AU_BG_01	2107227-01	Soil	07/14/21 11:50	07/15/21 16:00
CIG_AU_BG_02	2107227-02	Soil	07/14/21 11:45	07/15/21 16:00
CIG_AU_BG_03	2107227-03	Soil	07/14/21 12:00	07/15/21 16:00
CIT_AU_SS_01	2107227-04	Soil	07/14/21 10:50	07/15/21 16:00
CIT_AU_SS_02	2107227-05	Soil	07/14/21 10:55	07/15/21 16:00
CIT_AU_SS_03	2107227-06	Soil	07/14/21 11:00	07/15/21 16:00
CIT_AU_SS_04	2107227-07	Soil	07/14/21 11:05	07/15/21 16:00
CIT_AU_SS_05	2107227-08	Soil	07/14/21 11:10	07/15/21 16:00
CIT_AU_SS_06	2107227-09	Soil	07/14/21 11:20	07/15/21 16:00
CIT_AU_SS_07	2107227-10	Soil	07/14/21 11:25	07/15/21 16:00
CIT_AU_SS_08	2107227-11	Soil	07/14/21 11:30	07/15/21 16:00

Summit Scientific

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.

Summit Scientific

S₂

2107227.1

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 1 of 2

Client: Absaroka Energy and Environmental Solutions

Project Manager: Kenneth Rogowski

Address: 112 High ST.

E-Mail: max.moran@absarokasolutions.com

City/State/Zip: Buffalo, WY, 82834

ken.rogowski@absarokasolutions.com

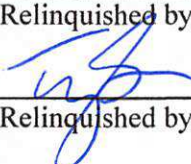
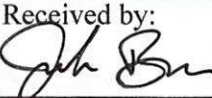
Phone:

Project Name: Arapahoe Unit Section 25S Spill Support

Sampler Name: Tyler Scherden

Project Number: CIT.CO.0555.01

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested							Special Instructions
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	Fuller 915 Suite	EC	SAR	pH	Boron*	Metals		
1	CIT_AU_BG_01	7/14/2021	1150	3			X							X	X	X	X	X		
2	CIT_AU_BG_02	7/14/2021	1145	3			X							X	X	X	X	X		
3	CIT_AU_BG_03	7/14/2021	1200	3			X							X	X	X	X	X		
4	CIT_AU_SS_01	7/14/2021	1050	3			X						X							
5	CIT_AU_SS_02	7/14/2021	1055	3			X						X							
6	CIT_AU_SS_03	7/14/2021	1100	3			X						X							
7	CIT_AU_SS_04	7/14/2021	1105	3			X						X							
8	CIT_AU_SS_05	7/14/2021	1110	3			X						X							
9	CIT_AU_SS_06	7/14/2021	1120	3			X						X							
10	CIT_AU_SS_07	7/14/2021	1125	3			X						X							

Relinquished by: 	Date/Time: 7/14/21 1600	Received by: 	Date/Time: 7/15/21 1600	Turn Around Time (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <u>X</u> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>4</u> Samples Intact: <u>Yes</u> No	Notes: *HWS - Hot Water Soluble
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

Summit Scientific

S₂

2107227.2

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 2 of 2

Client: Absaroka Energy and Environmental Solutions

Project Manager: Kenneth Rogowski

Address: 112 High ST.

E-Mail: max.moran@absarokasolutions.com

City/State/Zip: Buffalo, WY, 82834

ken.rogowski@absarokasolutions.com

Phone:

Project Name: Arapahoe Unit Section 25S Spill Support

Sampler Name: Tyler Scherden

Project Number: CIT.CO.0555.01

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested							Special Instructions		
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	Fuller 915 Suite	EC	SAR	pH	Boron*	Metals				
1	CIT_AU_SS_08	7/14/2021	1130	3			X							X								
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <u>X</u> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>4</u> Samples Intact: <u>Yes</u> No	Notes: *HWS - Hot Water Soluble
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

Sample Receipt Checklist

S2 Work Order

2107227

Client: **Absaroka**

Client Project ID: **Arapahoe Unit Section 255 Spill Support**

Shipped Via: ☒ H.D./P.U./FedEx/UPS/USPS/Other

Airbill #:

Matrix (check all that apply):

☐ Air

☒ Soil/Solid

☐ Water

☐ Other:

(Describe)

Temp (°C)

4

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>On ice.</i>
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace 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 (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

JB

Custodian Printed Name or Initials

John Bon

Signature of Custodian

7/15/21

Date/Time



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_01
2107227-01 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Boron	0.141	0.0100		mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	4.48	0.220		mg/kg dry	1	BEG0365	07/21/21	07/23/21	EPA 6020B	
Barium	127	0.440		"	"	"	"	"	"	
Cadmium	0.262	0.220		"	"	"	"	"	"	
Copper	57.5	0.440		"	"	"	"	"	"	
Lead	22.0	0.220		"	"	"	"	"	"	
Nickel	7.08	0.440		"	"	"	"	"	"	
Selenium	1.51	0.286		"	"	"	"	"	"	
Silver	0.0800	0.0220		"	"	"	"	"	"	
Zinc	221	0.440		"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Calcium	52.9	0.0549		mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	6.27	0.0549		"	"	"	"	"	"	
Sodium	7.24	0.0549		"	"	"	"	"	"	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_01
2107227-01 (Soil)

Summit Scientific

Calculated Analysis

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.251	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	91.0		%	1	BEG0275	07/16/21	07/16/21	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.383	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.02		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_02
2107227-02 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Boron	0.313	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Arsenic	2.13	0.221	mg/kg dry	1	BEG0365	07/21/21	07/23/21	EPA 6020B	
Barium	128	0.442	"	"	"	"	"	"	
Cadmium	0.266	0.221	"	"	"	"	"	"	
Copper	8.98	0.442	"	"	"	"	"	"	
Lead	8.48	0.221	"	"	"	"	"	"	
Nickel	6.61	0.442	"	"	"	"	"	"	
Selenium	1.58	0.287	"	"	"	"	"	"	
Silver	0.0360	0.0221	"	"	"	"	"	"	
Zinc	33.9	0.442	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Calcium	145	0.0552	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	17.5	0.0552	"	"	"	"	"	"	
Sodium	9.15	0.0552	"	"	"	"	"	"	

Calculated Analysis

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_02
2107227-02 (Soil)

Summit Scientific

Calculated Analysis

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.191	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	90.6		%	1	BEG0275	07/16/21	07/16/21	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.58	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.70		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_03
2107227-03 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Boron	0.244	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Arsenic	3.71	0.235	mg/kg dry	1	BEG0365	07/21/21	07/23/21	EPA 6020B	
Barium	128	0.470	"	"	"	"	"	"	
Cadmium	0.350	0.235	"	"	"	"	"	"	
Copper	31.3	0.470	"	"	"	"	"	"	
Lead	14.0	0.235	"	"	"	"	"	"	
Nickel	8.05	0.470	"	"	"	"	"	"	
Selenium	1.69	0.305	"	"	"	"	"	"	
Silver	0.0592	0.0235	"	"	"	"	"	"	
Zinc	135	0.470	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Calcium	97.1	0.0587	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	23.2	0.0587	"	"	"	"	"	"	
Sodium	4.17	0.0587	"	"	"	"	"	"	

Calculated Analysis

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIG_AU_BG_03
2107227-03 (Soil)

Summit Scientific

Calculated Analysis

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.0987	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	85.1		%	1	BEG0275	07/16/21	07/16/21	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.07	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.18		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_01
2107227-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		124 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	87	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		109 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_01
2107227-04 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		74.3 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		70.1 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.700	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_01
2107227-04 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	3.49	0.223	mg/kg dry	1	BEG0365	07/21/21	07/23/21	EPA 6020B
Barium	150	0.446	"	"	"	"	"	"
Cadmium	ND	0.223	"	"	"	"	"	"
Copper	10.0	0.446	"	"	"	"	"	"
Lead	7.13	0.223	"	"	"	"	"	"
Nickel	7.02	0.446	"	"	"	"	"	"
Selenium	1.31	0.290	"	"	"	"	"	"
Silver	0.0374	0.0223	"	"	"	"	"	"
Zinc	57.2	0.446	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	947	0.0558	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	130	0.0558	"	"	"	"	"	"	
Sodium	6040	0.0558	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	48.8	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_01
2107227-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	89.6	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	29.7	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.70		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_02
2107227-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		94.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		120 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		100 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_02
2107227-05 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		50.0 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		64.4 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.775	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_02
2107227-05 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	3.61	0.239	mg/kg dry	1	BEG0365	07/21/21	07/23/21	EPA 6020B
Barium	158	0.479	"	"	"	"	"	"
Cadmium	ND	0.239	"	"	"	"	"	"
Copper	8.51	0.479	"	"	"	"	"	"
Lead	7.60	0.239	"	"	"	"	"	"
Nickel	8.01	0.479	"	"	"	"	"	"
Selenium	1.54	0.311	"	"	"	"	"	"
Silver	0.0378	0.0239	"	"	"	"	"	"
Zinc	43.3	0.479	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	804	0.0598	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	121	0.0598	"	"	"	"	"	"	
Sodium	5900	0.0598	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	51.3	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_02
2107227-05 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	83.6	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	26.3	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.81		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_03
2107227-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		89.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		118 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_03
2107227-06 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		58.0 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		45.2 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.621	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_03
2107227-06 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	3.89	0.228	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	187	0.456	"	"	"	"	"	"
Cadmium	0.243	0.228	"	"	"	"	"	"
Copper	9.97	0.456	"	"	"	"	"	"
Lead	8.59	0.228	"	"	"	"	"	"
Nickel	9.56	0.456	"	"	"	"	"	"
Selenium	1.69	0.297	"	"	"	"	"	"
Silver	0.0456	0.0228	"	"	"	"	"	"
Zinc	119	0.456	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1210	0.0571	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	167	0.0571	"	"	"	"	"	"	
Sodium	6340	0.0571	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	45.3	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_03
2107227-06 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	87.6	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	30.8	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.76		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_04
2107227-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		96.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		119 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	200	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	51	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_04
2107227-07 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	0.00550	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		58.2 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		53.6 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.379	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_04
2107227-07 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	10.6	0.276	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	179	0.552	"	"	"	"	"	"
Cadmium	ND	0.276	"	"	"	"	"	"
Copper	28.4	0.552	"	"	"	"	"	"
Lead	17.1	0.276	"	"	"	"	"	"
Nickel	11.6	0.552	"	"	"	"	"	"
Selenium	1.99	0.359	"	"	"	"	"	"
Silver	0.0408	0.0276	"	"	"	"	"	"
Zinc	372	0.552	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	507	0.0690	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	55.9	0.0690	"	"	"	"	"	"	
Sodium	2340	0.0690	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	26.3	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_04
2107227-07 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	72.5	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	11.1	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.96		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_05
2107227-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		99.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		121 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.4 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	59	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_05
2107227-08 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	0.00970	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		62.2 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		54.9 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.868	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_05
2107227-08 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	4.10	0.258	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	180	0.517	"	"	"	"	"	"
Cadmium	0.345	0.258	"	"	"	"	"	"
Copper	28.4	0.517	"	"	"	"	"	"
Lead	9.67	0.258	"	"	"	"	"	"
Nickel	10.2	0.517	"	"	"	"	"	"
Selenium	1.73	0.336	"	"	"	"	"	"
Silver	0.0461	0.0258	"	"	"	"	"	"
Zinc	420	0.517	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1030	0.0646	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	155	0.0646	"	"	"	"	"	"	
Sodium	7090	0.0646	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	54.5	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_05
2107227-08 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	77.4	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	28.4	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.75		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_06
2107227-09 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		95.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		120 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.7 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		104 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_06
2107227-09 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	0.00773	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	0.00671	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		52.5 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		67.3 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.629	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_06
2107227-09 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	2.54	0.226	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	120	0.453	"	"	"	"	"	"
Cadmium	ND	0.226	"	"	"	"	"	"
Copper	8.14	0.453	"	"	"	"	"	"
Lead	5.83	0.226	"	"	"	"	"	"
Nickel	7.05	0.453	"	"	"	"	"	"
Selenium	1.28	0.294	"	"	"	"	"	"
Silver	0.0324	0.0226	"	"	"	"	"	"
Zinc	70.5	0.453	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	921	0.0566	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	133	0.0566	"	"	"	"	"	"	
Sodium	7110	0.0566	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	58.0	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_06
2107227-09 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	88.4	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	33.0	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.78		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_07
2107227-10 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		121 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.2 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_07
2107227-10 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		70.3 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		60.0 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.511	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_07
2107227-10 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	3.51	0.220	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	136	0.439	"	"	"	"	"	"
Cadmium	ND	0.220	"	"	"	"	"	"
Copper	9.02	0.439	"	"	"	"	"	"
Lead	7.21	0.220	"	"	"	"	"	"
Nickel	7.37	0.439	"	"	"	"	"	"
Selenium	1.40	0.286	"	"	"	"	"	"
Silver	0.0334	0.0220	"	"	"	"	"	"
Zinc	48.4	0.439	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	748	0.0549	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	105	0.0549	"	"	"	"	"	"	
Sodium	5700	0.0549	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	51.7	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_07
2107227-10 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	91.0	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	27.4	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.79		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_08
2107227-11 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEG0299	07/16/21	07/17/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		59.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		134 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEG0301	07/16/21	07/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_08
2107227-11 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEG0283	07/16/21	07/18/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		67.4 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		48.7 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.598	0.0100	mg/L	1	BEG0309	07/19/21	07/20/21	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_08
2107227-11 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	3.33	0.227	mg/kg dry	1	BEG0365	07/21/21	07/24/21	EPA 6020B
Barium	121	0.454	"	"	"	"	"	"
Cadmium	ND	0.227	"	"	"	"	"	"
Copper	7.15	0.454	"	"	"	"	"	"
Lead	5.85	0.227	"	"	"	"	"	"
Nickel	7.00	0.454	"	"	"	"	"	"
Selenium	1.35	0.295	"	"	"	"	"	"
Silver	0.0338	0.0227	"	"	"	"	"	"
Zinc	45.0	0.454	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BEG0295	07/16/21	07/16/21	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	949	0.0568	mg/L dry	1	BEG0311	07/19/21	07/21/21	EPA 6020B	
Magnesium	142	0.0568	"	"	"	"	"	"	
Sodium	5240	0.0568	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	41.9	0.00100	units	1	BEG0367	07/21/21	07/21/21	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

CIT_AU_SS_08
2107227-11 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	88.1	%	1	BEG0275	07/16/21	07/16/21	Calculation
----------	------	---	---	---------	----------	----------	-------------

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	26.2	0.0100	mmhos/cm	1	BEG0333	07/20/21	07/20/21	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **07/14/21 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.83		pH Units	1	BEG0331	07/20/21	07/20/21	EPA 9045D	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0299 - EPA 5030 Soil MS

Blank (BEG0299-BLK1)

Prepared & Analyzed: 07/16/21

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
1,2,4-Trimethylbenzene	ND	0.0050	"							
1,3,5-Trimethylbenzene	ND	0.0050	"							
Naphthalene	ND	0.0038	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0435		"	0.0400		109	23-173			
Surrogate: Toluene-d8	0.0520		"	0.0400		130	20-170			
Surrogate: 4-Bromofluorobenzene	0.0454		"	0.0400		114	21-167			

LCS (BEG0299-BS1)

Prepared: 07/16/21 Analyzed: 07/17/21

Benzene	0.0623	0.0020	mg/kg	0.0750		83.1	70-130			
Toluene	0.0889	0.0050	"	0.0750		119	70-130			
Ethylbenzene	0.0862	0.0050	"	0.0750		115	70-130			
m,p-Xylene	0.173	0.010	"	0.150		115	70-130			
o-Xylene	0.0848	0.0050	"	0.0750		113	70-130			
1,2,4-Trimethylbenzene	0.0903	0.0050	"	0.0750		120	70-130			
1,3,5-Trimethylbenzene	0.0890	0.0050	"	0.0750		119	70-130			
Naphthalene	0.0739	0.0038	"	0.0750		98.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0340		"	0.0400		85.0	23-173			
Surrogate: Toluene-d8	0.0474		"	0.0400		119	20-170			
Surrogate: 4-Bromofluorobenzene	0.0376		"	0.0400		94.0	21-167			

Matrix Spike (BEG0299-MS1)

Source: 2107195-01

Prepared: 07/16/21 Analyzed: 07/17/21

Benzene	0.0753	0.0020	mg/kg	0.0750	ND	100	70-130			
Toluene	0.0824	0.0050	"	0.0750	ND	110	70-130			
Ethylbenzene	0.0963	0.0050	"	0.0750	ND	128	70-130			
m,p-Xylene	0.166	0.010	"	0.150	ND	111	70-130			
o-Xylene	0.0971	0.0050	"	0.0750	ND	129	70-130			
1,2,4-Trimethylbenzene	0.0737	0.0050	"	0.0750	ND	98.2	70-130			
1,3,5-Trimethylbenzene	0.0714	0.0050	"	0.0750	ND	95.2	70-130			
Naphthalene	0.0911	0.0038	"	0.0750	ND	121	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0344		"	0.0400		86.1	23-173			
Surrogate: Toluene-d8	0.0552		"	0.0400		138	20-170			
Surrogate: 4-Bromofluorobenzene	0.0407		"	0.0400		102	21-167			

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0299 - EPA 5030 Soil MS

Matrix Spike Dup (BEG0299-MSD1)	Source: 2107195-01			Prepared: 07/16/21 Analyzed: 07/17/21						
Benzene	0.0699	0.0020	mg/kg	0.0750	ND	93.2	70-130	7.44	30	
Toluene	0.0871	0.0050	"	0.0750	ND	116	70-130	5.52	30	
Ethylbenzene	0.0928	0.0050	"	0.0750	ND	124	70-130	3.68	30	
m,p-Xylene	0.187	0.010	"	0.150	ND	125	70-130	11.9	30	
o-Xylene	0.0919	0.0050	"	0.0750	ND	123	70-130	5.52	30	
1,2,4-Trimethylbenzene	0.0795	0.0050	"	0.0750	ND	106	70-130	7.60	30	
1,3,5-Trimethylbenzene	0.0965	0.0050	"	0.0750	ND	129	70-130	29.9	30	
Naphthalene	0.0920	0.0038	"	0.0750	ND	123	70-130	0.950	30	
Surrogate: 1,2-Dichloroethane-d4	0.0380		"	0.0400		95.0	23-173			
Surrogate: Toluene-d8	0.0500		"	0.0400		125	20-170			
Surrogate: 4-Bromofluorobenzene	0.0385		"	0.0400		96.2	21-167			

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0301 - EPA 3550A

Blank (BEG0301-BLK1)

Prepared & Analyzed: 07/16/21

C10-C28 (DRO)	ND	50	mg/kg
C28-C36 (ORO)	ND	50	"

LCS (BEG0301-BS1)

Prepared & Analyzed: 07/16/21

C10-C28 (DRO)	472	50	mg/kg	500	94.3	70-130
---------------	-----	----	-------	-----	------	--------

Matrix Spike (BEG0301-MS1)

Source: 2107195-01

Prepared & Analyzed: 07/16/21

C10-C28 (DRO)	604	50	mg/kg	500	14.6	118	70-130
---------------	-----	----	-------	-----	------	-----	--------

Matrix Spike Dup (BEG0301-MSD1)

Source: 2107195-01

Prepared & Analyzed: 07/16/21

C10-C28 (DRO)	597	50	mg/kg	500	14.6	117	70-130	1.19	20
---------------	-----	----	-------	-----	------	-----	--------	------	----

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

Reporting				Spike	Source	%REC			RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0283 - EPA 5030 Soil MS

Blank (BEG0283-BLK1)

Prepared: 07/16/21 Analyzed: 07/18/21

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
Surrogate: 2-Methylnaphthalene-d10	0.0174		"	0.0333		52.3	40-150			
Surrogate: Fluoranthene-d10	0.0229		"	0.0333		68.8	40-150			

LCS (BEG0283-BS1)

Prepared: 07/16/21 Analyzed: 07/18/21

Acenaphthene	0.0228	0.00500	mg/kg	0.0333		68.5	31-137			
Anthracene	0.0226	0.00500	"	0.0333		67.7	30-120			
Benzo (a) anthracene	0.0234	0.00500	"	0.0333		70.1	30-120			
Benzo (a) pyrene	0.0231	0.00500	"	0.0333		69.4	30-120			
Benzo (b) fluoranthene	0.0268	0.00500	"	0.0333		80.4	30-120			
Benzo (k) fluoranthene	0.0291	0.00500	"	0.0333		87.4	30-120			
Chrysene	0.0233	0.00500	"	0.0333		69.9	30-120			
Dibenz (a,h) anthracene	0.0225	0.00500	"	0.0333		67.5	30-120			
Fluoranthene	0.0245	0.00500	"	0.0333		73.4	30-120			
Fluorene	0.0237	0.00500	"	0.0333		71.2	30-120			
Indeno (1,2,3-cd) pyrene	0.0204	0.00500	"	0.0333		61.2	30-120			
Pyrene	0.0244	0.00500	"	0.0333		73.3	35-142			
1-Methylnaphthalene	0.0227	0.00500	"	0.0333		68.1	35-142			
2-Methylnaphthalene	0.0215	0.00500	"	0.0333		64.5	35-142			
Surrogate: 2-Methylnaphthalene-d10	0.0226		"	0.0333		67.8	40-150			
Surrogate: Fluoranthene-d10	0.0244		"	0.0333		73.1	40-150			

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

Analyte	Reporting			Spike		Source		%REC		RPD	
	Result	Limit	Units	Level		Result		%REC	Limits	RPD	Limit

Batch BEG0283 - EPA 5030 Soil MS

Matrix Spike (BEG0283-MS1)				Source: 2107192-01		Prepared: 07/16/21		Analyzed: 07/18/21	
Acenaphthene	0.0216	0.00500	mg/kg	0.0333	ND	64.7	31-137		
Anthracene	0.0211	0.00500	"	0.0333	ND	63.4	30-120		
Benzo (a) anthracene	0.0209	0.00500	"	0.0333	ND	62.8	30-120		
Benzo (a) pyrene	0.0208	0.00500	"	0.0333	ND	62.5	30-120		
Benzo (b) fluoranthene	0.0241	0.00500	"	0.0333	ND	72.3	30-120		
Benzo (k) fluoranthene	0.0270	0.00500	"	0.0333	ND	81.0	30-120		
Chrysene	0.0214	0.00500	"	0.0333	ND	64.2	30-120		
Dibenz (a,h) anthracene	0.0220	0.00500	"	0.0333	ND	65.9	30-120		
Fluoranthene	0.0239	0.00500	"	0.0333	ND	71.6	30-120		
Fluorene	0.0224	0.00500	"	0.0333	ND	67.2	30-120		
Indeno (1,2,3-cd) pyrene	0.0157	0.00500	"	0.0333	ND	47.2	30-120		
Pyrene	0.0233	0.00500	"	0.0333	ND	69.8	35-142		
1-Methylnaphthalene	0.0203	0.00500	"	0.0333	ND	61.0	15-130		
2-Methylnaphthalene	0.0208	0.00500	"	0.0333	ND	62.3	15-130		
Surrogate: 2-Methylnaphthalene-d10	0.0202		"	0.0333		60.7	40-150		
Surrogate: Fluoranthene-d10	0.0231		"	0.0333		69.4	40-150		

Matrix Spike Dup (BEG0283-MSD1)				Source: 2107192-01		Prepared: 07/16/21		Analyzed: 07/18/21	
Acenaphthene	0.0232	0.00500	mg/kg	0.0333	ND	69.6	31-137	7.27	30
Anthracene	0.0225	0.00500	"	0.0333	ND	67.6	30-120	6.38	30
Benzo (a) anthracene	0.0223	0.00500	"	0.0333	ND	67.0	30-120	6.57	30
Benzo (a) pyrene	0.0221	0.00500	"	0.0333	ND	66.4	30-120	6.05	30
Benzo (b) fluoranthene	0.0252	0.00500	"	0.0333	ND	75.6	30-120	4.55	30
Benzo (k) fluoranthene	0.0276	0.00500	"	0.0333	ND	82.7	30-120	2.09	30
Chrysene	0.0224	0.00500	"	0.0333	ND	67.1	30-120	4.35	30
Dibenz (a,h) anthracene	0.0192	0.00500	"	0.0333	ND	57.7	30-120	13.3	30
Fluoranthene	0.0244	0.00500	"	0.0333	ND	73.1	30-120	2.10	30
Fluorene	0.0238	0.00500	"	0.0333	ND	71.5	30-120	6.15	30
Indeno (1,2,3-cd) pyrene	0.0185	0.00500	"	0.0333	ND	55.5	30-120	16.1	30
Pyrene	0.0240	0.00500	"	0.0333	ND	72.1	35-142	3.34	30
1-Methylnaphthalene	0.0232	0.00500	"	0.0333	ND	69.7	15-130	13.4	50
2-Methylnaphthalene	0.0225	0.00500	"	0.0333	ND	67.5	15-130	8.01	50
Surrogate: 2-Methylnaphthalene-d10	0.0224		"	0.0333		67.3	40-150		
Surrogate: Fluoranthene-d10	0.0236		"	0.0333		70.8	40-150		

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0309 - EPA 3050B

Blank (BEG0309-BLK1)

Prepared: 07/19/21 Analyzed: 07/20/21

Boron ND 0.0100 mg/L

LCS (BEG0309-BS1)

Prepared: 07/19/21 Analyzed: 07/20/21

Boron 5.16 0.0100 mg/L 5.00 103 80-120

Duplicate (BEG0309-DUP1)

Source: 2107227-01

Prepared: 07/19/21 Analyzed: 07/20/21

Boron 0.139 0.0100 mg/L 0.141 1.43 20

Matrix Spike (BEG0309-MS1)

Source: 2107227-01

Prepared: 07/19/21 Analyzed: 07/20/21

Boron 5.16 0.0100 mg/L 5.00 0.141 100 75-125

Matrix Spike Dup (BEG0309-MSD1)

Source: 2107227-01

Prepared: 07/19/21 Analyzed: 07/20/21

Boron 5.18 0.0100 mg/L 5.00 0.141 101 75-125 0.403 25

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0365 - EPA 3050B

Blank (BEG0365-BLK1)

Prepared: 07/21/21 Analyzed: 07/23/21

Arsenic	ND	0.200	mg/kg wet
Barium	ND	0.400	"
Cadmium	ND	0.200	"
Copper	ND	0.400	"
Lead	ND	0.200	"
Nickel	ND	0.400	"
Selenium	ND	0.260	"
Silver	ND	0.0200	"
Zinc	ND	0.400	"

LCS (BEG0365-BS1)

Prepared: 07/21/21 Analyzed: 07/23/21

Arsenic	46.6	0.200	mg/kg wet	40.0	116	80-120
Barium	43.9	0.400	"	40.0	110	80-120
Cadmium	2.14	0.200	"	2.00	107	80-120
Copper	42.9	0.400	"	40.0	107	80-120
Lead	19.7	0.200	"	20.0	98.7	80-120
Nickel	44.1	0.400	"	40.0	110	80-120
Selenium	4.59	0.260	"	4.00	115	80-120
Silver	2.05	0.0200	"	2.00	102	80-120
Zinc	44.4	0.400	"	40.0	111	80-120

Duplicate (BEG0365-DUP1)

Source: 2107090-04

Prepared: 07/21/21 Analyzed: 07/23/21

Arsenic	1.57	0.207	mg/kg dry	1.76	11.5	20
Barium	40.0	0.414	"	37.9	5.46	20
Cadmium	0.188	0.207	"	0.184	2.23	20
Copper	18.2	0.414	"	18.5	1.54	20
Lead	17.5	0.207	"	17.4	0.593	20
Nickel	2.55	0.414	"	2.89	12.5	20
Selenium	0.947	0.269	"	0.960	1.36	20
Silver	0.128	0.0207	"	0.131	2.04	20
Zinc	41.4	0.414	"	42.3	1.92	20

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0365 - EPA 3050B

Matrix Spike (BEG0365-MS1)		Source: 2107090-04			Prepared: 07/21/21 Analyzed: 07/23/21					
Arsenic	47.4	0.207	mg/kg dry	41.4	1.76	110	75-125			
Barium	83.2	0.414	"	41.4	37.9	110	75-125			
Cadmium	2.28	0.207	"	2.07	0.184	102	75-125			
Copper	60.9	0.414	"	41.4	18.5	103	75-125			
Lead	35.7	0.207	"	20.7	17.4	88.2	75-125			
Nickel	45.6	0.414	"	41.4	2.89	103	75-125			
Selenium	5.40	0.269	"	4.14	0.960	107	75-125			
Silver	2.10	0.0207	"	2.07	0.131	95.4	75-125			
Zinc	86.2	0.414	"	41.4	42.3	106	75-125			

Matrix Spike Dup (BEG0365-MSD1)		Source: 2107090-04			Prepared: 07/21/21 Analyzed: 07/23/21					
Arsenic	48.2	0.207	mg/kg dry	41.4	1.76	112	75-125	1.65	25	
Barium	80.7	0.414	"	41.4	37.9	104	75-125	3.04	25	
Cadmium	2.27	0.207	"	2.07	0.184	101	75-125	0.507	25	
Copper	61.5	0.414	"	41.4	18.5	104	75-125	0.947	25	
Lead	36.8	0.207	"	20.7	17.4	93.5	75-125	3.01	25	
Nickel	46.4	0.414	"	41.4	2.89	105	75-125	1.71	25	
Selenium	5.42	0.269	"	4.14	0.960	108	75-125	0.490	25	
Silver	2.09	0.0207	"	2.07	0.131	94.9	75-125	0.487	25	
Zinc	86.8	0.414	"	41.4	42.3	108	75-125	0.708	25	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Hexavalent Chromium by EPA Method 7196 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0295 - 3060A Mod

Blank (BEG0295-BLK1)

Prepared & Analyzed: 07/16/21

Chromium, Hexavalent ND 0.30 mg/kg wet

LCS (BEG0295-BS1)

Prepared & Analyzed: 07/16/21

Chromium, Hexavalent 24.2 0.30 mg/kg wet 25.0 97.0 80-120

Duplicate (BEG0295-DUP1)

Source: 2106379-01

Prepared & Analyzed: 07/16/21

Chromium, Hexavalent ND 0.30 mg/kg dry ND 20

Matrix Spike (BEG0295-MS1)

Source: 2106379-01

Prepared & Analyzed: 07/16/21

Chromium, Hexavalent 24.2 0.30 mg/kg dry 28.5 ND 85.0 75-125

Matrix Spike Dup (BEG0295-MSD1)

Source: 2106379-01

Prepared & Analyzed: 07/16/21

Chromium, Hexavalent 24.0 0.30 mg/kg dry 28.5 ND 84.2 75-125 0.946 20

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0311 - General Preparation

Blank (BEG0311-BLK1)

Prepared: 07/19/21 Analyzed: 07/21/21

Calcium	ND	0.0500	mg/L wet
Magnesium	ND	0.0500	"
Sodium	ND	0.0500	"

LCS (BEG0311-BS1)

Prepared: 07/19/21 Analyzed: 07/21/21

Calcium	5.37	0.0500	mg/L wet	5.00	107	70-130
Magnesium	5.72	0.0500	"	5.00	114	70-130
Sodium	5.29	0.0500	"	5.00	106	70-130

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support

Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD	
		Limit	Units		Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0275 - General Preparation

Duplicate (BEG0275-DUP1)		Source: 2106379-01		Prepared & Analyzed: 07/16/21						
% Solids	88.1		%		87.7			0.454	20	

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support
Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD	
		Limit	Units		Result	%REC	Limits	RPD	Limit	Notes

Batch BEG0333 - General Preparation

Blank (BEG0333-BLK1)

Prepared & Analyzed: 07/20/21

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BEG0333-BS1)

Prepared & Analyzed: 07/20/21

Specific Conductance (EC) 0.143 0.0100 mmhos/cm 0.150 95.3 90-110

Duplicate (BEG0333-DUP1)

Source: 2107227-01

Prepared & Analyzed: 07/20/21

Specific Conductance (EC) 0.383 0.0100 mmhos/cm 0.383 0.0261 20

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support

Project Number: CIT.CO.0555.01

Project Manager: Ken Rogowski

Reported:

07/26/21 16:30

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting			Spike	Source		%REC		RPD	
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	

Batch BEG0331 - General Preparation

LCS (BEG0331-BS1)

Prepared & Analyzed: 07/20/21

pH	9.27	pH Units	9.21	101	95-105
----	------	----------	------	-----	--------

Duplicate (BEG0331-DUP1)

Source: 2107088-08

Prepared & Analyzed: 07/20/21

pH	8.07	pH Units	8.05	0.248	20
----	------	----------	------	-------	----

Summit Scientific

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.



Absaroka Solutions
112 High Street
Buffalo WY, 82834

Project: Arapahoe Unit Section 25S Spill Support

Project Number: CIT.CO.0555.01
Project Manager: Ken Rogowski

Reported:
07/26/21 16:30

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Appendix E – Photolog



Photographic Log

Arapaho Unit Section 25S Tank Battery

Site Sampling and Delineation (July 17th, 2021)

Table of Contents

OVERVIEW	1
DELINEATION AND SOIL SAMPLING	6

OVERVIEW



Photo No 1:

Description:
Arapaho Unit
Section 25S
release site facing
north.



Photo No 2:

Description:
Arapaho Unit
Section 25S
release site facing
east.



Photo No 3:

Description:
Arapaho Unit
Section 25S
release site facing
south.



Photo No 4:

Description:
Arapaho Unit
Section 25S
release site facing
west.



Photo No 5:

Description: Origin of the release, facing east.



Photo No 6:

Description: Origin of the release, facing southwest.



Photo No 7:

Description: Origin of the release



Photo No 8:

Description: Impacted area, facing south.



Photo No 9:

Description:
Impacted area,
facing north.



Photo No 10:

Description:
Impacted area,
facing north.

DELINEATION AND SOIL SAMPLING



Photo No 11:

Description:
Sampling location
CIT_AU_SS_01.
Northwest corner
within containment.



Photo No 12:

Description:
Sampling location of
CIT_AU_SS_02.



Photo No 13:

Description:
Sampling location of
CIT_AU_SS_03.
Southeast corner of
containment



Photo No 14:

Description:
Sampling location of
CIT_AU_SS_04.



Photo No 15:

Description:
Sampling location of
CIT_AU_SS_05.



Photo No 16:

Description:
Sampling location of
CIT_AU_SS_06.



Photo No 17:

Description:
Sampling location of
CIT_AU_SS_07.



Photo No 18:

Description:
Sampling location of
CIT_AU_SS_08.
Southeast corner of
containment



Photo No 19:

Description:
Sampling location of
CIT_AU_BG_01.
Sample collected
adjacent to the
northwest corner of
pad.



Photo No 20:

Description:
Sampling location of
CIT_AU_BG_02.
Sample collected in
pasture north of
release.



Photo No 21:

Description:
Sampling location of
CIT_AU_BG_03.
Sample collected in
tilted agricultural field
southwest of pad.

