Hecla Limited

Independent Remedial Action Report

Washington State Highway 20, Mile Marker 407, Ione, Washington

May 15, 2024

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Hecla Limited

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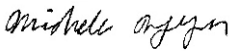

Michelle Nguyen
Environmental Scientist

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Acronyms and Abbreviations

Arcadis	Arcadis U.S., Inc.
Chem Waste	Chemical Waste Management of the Northwest
COC	constituent of concern
CUL	cleanup level
Ecology	Washington State Department of Environmental Ecology
Eurofins	Eurofins TestAmerica Laboratory
Hecla	Hecla Limited
mg/kg	milligram per kilogram
MTCA	Model Toxics Control Act
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
WAC	Washington Administrative Code
XRF	X-ray fluorescence
ZBI	Zanetti Brothers, Inc.

1 Introduction

This Independent Remedial Action Report describes cleanup actions undertaken by Hecla Limited (Hecla) in response to release of material to the ground surface along Washington State Highway 20 south of Ione, Washington.

On February 16, 2024, a pup trailer transporting approximately 31,000 pounds of zinc concentrate from the Hecla Lucky Friday Mine in Mullan, Idaho overturned while traveling north on Washington State Highway 20 near Mile Marker 407, south of Ione, Washington (the Site), resulting in a release of the concentrate onto the ground surface. The extent of the concentrate release was limited to approximately 3,000 square feet of the highway right-of-way (ROW) and the Pend Oreille Valley Railroad (POVA) ROW. In response to the incident, Hecla notified Arcadis U.S., Inc. (Arcadis) to respond to the Site through implementation of its Incident Response and Recovery Plan (Hecla 2023) and mine-specific incident response and recovery procedures. Arcadis promptly notified the following entities on Hecla's behalf and case numbers were opened as shown:

- Washington Emergency Management – State # 24-0700;
- Washington Department of Ecology (Ecology) – Environmental Reports Tracking System (ERTS) Case # 728846;
- National Response Center – Incident Report # 1391743; and
- POVA.

This report was prepared to summarize cleanup actions undertaken by Arcadis in accordance with Model Toxics Control Act (MTCA) Cleanup Regulation Chapter 173-340-515 of the Washington Administrative Code (WAC). Cleanup activities were completed on April 1, 2024.

1.1 Site Description

The release Site is located near mile marker 407 on Washington State Highway 20, approximately 10 miles south of Ione, Washington (**Figure 1**), within the highway's eastbound ROW and the POVA west ROW. The remedial excavation area includes the highway east ROW leading down to a flat base of a ditch into the POVA railroad west ROW and ending at the railroad tracks. High voltage powerlines are present over the middle of the ditch aligned parallel with both ROWs. The ROW and adjacent properties in the vicinity of the incident are wooded. The nearest downgradient surface water feature to the Site the Pend Oreille River is approximately 0.1 mile to the east. Surrounding features are depicted on the aerial site map shown on **Figure 1**.

2 Environmental Investigation Summary

This section describes the zinc concentrate constituent of concern (COC) and associated cleanup levels, and the incident response actions completed to remove, confirm, characterize, and dispose impacted materials. Regulatory correspondence with Ecology is documented in **Appendix B**. Soil sample locations and analytical results are shown on **Figure 2**. A photograph log depicting images from the response and cleanup effort is included as **Appendix C**.

2.1 Constituent of Concern

Zinc concentrate is the primary Site COC. As indicated on the zinc concentrate safety data sheet (included as **Appendix A**), the concentrate is 50 to 65 percent zinc sulfide. Through collaboration with Hecla and Ecology, zinc was confirmed as the target COC for the purposes of field screening and confirmation soil sampling and the MTCA cleanup level (CUL)[1] for zinc of 120 milligrams per kilogram (mg/kg) was established as the cleanup criteria for Site soil. Ecology requested testing samples for Target Analyte List (TAL) metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc). Groundwater was not encountered during excavation activities.

2.2 Incident Response

Arcadis was notified by Hecla that a haul truck owned and operated by Zanetti Brothers, Inc. (ZBI) pulling a pup trailer containing zinc concentrate from the Lucky Friday Mine had its pup trailer overturn while in transit to Trail, British Columbia in Canada on February 16, 2024, at approximately 8:00 a.m. The trailer went off the roadway, causing the trailer to disconnect from the haul truck and overturn in the eastbound highway ROW; approximately 31,000 pounds of zinc concentrate were spilled between the roadway and railroad tracks. The truck remained on the roadway during the accident. The response team performed an inspection of the truck saddle tanks and confirmed the tanks were not damaged or ruptured; there was no evidence of leaking fuel or oil having spilled to the ground surface. The approximate location of the release is shown on **Figure 1**.

2.2.1 Cleanup Activities

Arcadis mobilized to the Site on February 16, 2024, and met with ZBI, Washington State Patrol, and Ecology. Initial cleanup activities were performed by ZBI on February 16, 2024, with oversight by Arcadis. ZBI provided traffic control assistance along Highway 20 and the wrecked pup trailer was removed from the ditch using a crane from Evergreen State Towing at approximately 1:00 p.m. ZBI delivered two excavators, haul trucks, and pup trailers to the Site and began spill cleanup activities immediately after the wrecked pup trailer was removed from the ditch.

ZBI scrapped soil and zinc concentrate material using excavators from an area approximately 152 feet north to south and 35 feet east to west within the highway ROW and railroad ROW. On February 16 and 17, 2024, ZBI removed from the Site a total of three haul trucks and two pup trailers of soil mixed with zinc concentrate material.

[1] Model Toxics Control Act Soil Protective of Groundwater to Surface Water Vadose @13 degrees C Freshwater cleanup level

Approximately 2 to 4 inches of soil were removed from the excavation area. ZBI delivered approximately 17 tons of ¾-inch gravel import material, which was placed in the highway ROW and compacted with the excavator. ZBI also used hand tools to sweep zinc concentrate from the roadway and from the railroad ballast adjacent to the rail.

Arcadis mapped the excavation area, collected a sample of zinc concentrate material for initial waste characterization, and collected a total of 11 confirmation soil samples from the base of the excavation area (**Figure 2**) in accordance with the 2023 Hecla Lucky Friday Incident Response and Recovery Plan (Hecla 2023). Samples were submitted on February 19, 2024, to Eurofins TestAmerica Laboratory (Eurofins) in Spokane Valley, Washington for analysis. The initial waste characterization sample was analyzed for Resource Conservation and Recovery Act (RCRA) Total Metals and RCRA Metals Toxicity Characteristic Leaching Procedure (TCLP); confirmation soil samples were analyzed for metals by method SW846 6010D. The initial waste characterization sample exceeded CULs for lead, cadmium, and mercury. Zinc concentrations in the confirmation samples ranged from 260 to 530,000 mg/kg and exceeded the CUL of 120 mg/kg.

Arcadis collected soil samples for background metal analysis (as described in the next section) as well as a second waste characterization sample on February 29, 2024. Arcadis and ZBI returned to the Site on April 1, 2024, and excavated approximately 3 to 4 inches of additional soil from the original excavation area. Field staff screened the soil using an X-ray fluorescence (XRF) instrument, and the sampled area readings ranged from 45 to 88 parts per million (ppm) zinc. Multiple background XRF shots from areas far outside the excavation area ranged from 80 to 150 ppm zinc. Eleven additional confirmation soil samples were collected from locations corresponding to the initial confirmation sample locations (**Figure 2**) and were submitted for Eurofins for analysis of TAL metals.

Analytical results for zinc in the confirmation soil samples collected April 1, 2024 were at or below the CUL of 120 mg/kg, ranging from 34 to 120 mg/kg. Copper, iron, and manganese concentrations in the confirmation samples exceeded their respective CULs; the background samples collected on February 29, 2024, exceeded CULs for these analytes, as well.

The second waste characterization sample collected on February 29, 2024, did not detect metals exceedances above RCRA hazardous waste levels; therefore, the waste profiled as non-hazardous. ZBI loaded four haul trucks and four pup trailers with soil for non-hazardous disposal at the Burke repository in Burke, Idaho. The POVA railroad inspected the excavation area and determined that further restoration was not required.

Confirmation soil analytical results are presented in **Table 1**. Background soil analytical results are presented in **Table 2**. Laboratory analytical reports and chain-of-custody documentation are included in **Appendix D**.

2.2.2 Background Sampling

Arcadis collected 10 soil samples from the Site on February 29, 2024, for background metals analysis. Five samples were collected to the north, and five samples were collected to the south of the excavation area at approximate 50-foot spacing along the railroad ROW, as shown on **Figure 3**. The samples were submitted to Eurofins for analysis of TAL metals.

Analytical results for zinc in the background soil samples collected February 29, 2024, ranged from 68 to 130 mg/kg zinc, with one exceedance of the CUL in sample Ione-BG-2-022924 (130 mg/kg), collected approximately 100 feet north of the remedial excavation. Copper, iron, and manganese concentrations exceeded

their respective CULs. Background soil analytical results are presented in **Table 2**. Laboratory analytical reports and chain-of-custody documentation are included in **Appendix D**.

2.2.3 Characterization and Disposal

ZBI transported excavated soils to its waste staging area in Osburn, Idaho for staging and characterization prior to disposal. Arcadis collected composite waste characterization samples on February 17 and 29, 2024. The waste generated from the initial cleanup on February 16 and 17, 2024 characterized as hazardous waste due to detected concentrations that exceeded the RCRA TCLP lead limit of 5.0 milligrams per liter, whereas the second waste sample was characterized as nonhazardous waste. Laboratory analytical reports for the waste characterization samples are included in **Appendix D**.

Approximately 56.15 tons of excavated material that classified as hazardous waste was transported on April 24, 2024 to Chemical Waste Management of the Northwest (Chem Waste) located in Arlington, Oregon for disposal. The non-hazardous waste generated from the excavation on April 1, 2024, is securely stockpiled at ZBI's yard in Osburn, Idaho and will be transported to the Burke repository in Burke, Idaho for disposal in May 2024. Waste disposal documentation is included in **Appendix E**.

3 Conclusion

Cleanup activities at the Site consisted of zinc concentrate recovery, soil removal, offsite disposal, and collection of confirmation soil samples and background samples. Through implementation of the Incident Response and Recovery Plan (Hecla 2023) and mine-specific incident response and recovery procedures, staff mobilized to the Site immediately following the incident and responded to the overturned trailer and release accordingly. Seven haul trucks and six pup trailers filled with soil mixed with zinc concentrate and debris were successfully removed during cleanup activities. ZBI transported and disposed of approximately 56.15 tons of hazardous waste at Chem Waste on April 24, 2024. Non-hazardous waste from the second excavation is stockpiled at ZBI's yard located in Osburn, Idaho and the waste will be transported to the Burke Repository in Burke, Idaho for disposal in May 2024.

Confirmation soil sampling results demonstrate the successful removal of zinc concentrate from the Site to below CULs. Based upon the results of this independent remedial action, no apparent threat to human health or the environment stemming from the February 16, 2024, release exists and no further action is warranted at this time. The independent remedial action was successful in remediating the Site and meeting the substantive requirements of WAC 173-340-515. On behalf of Hecla, Arcadis requests that Ecology issue a No Further Action Determination for the Site.

4 References

Hecla. 2023. Incident Response and Recovery Plan, Lucky Friday Mine, Mullan, Idaho. January.

Tables

Table 1
Soil Sampling Analytical Results - Confirmation Samples
Incident Response - February and April 2024
Hecla Mining
Ione, Washington

Analyte	MTCA Method A CUL[1]	Soil Protective of Groundwater SW Vadose @ 13 degrees Celcius Fresh Water (Eq. 747-1)	Location/Sample ID	IONE-1-021624	IONE-1A-040124	IONE-2-021624	IONE-2A-040124	IONE-3-021624	IONE-3A-040124	IONE-4-021624	IONE-4A-040124
			Date	2/16/2024	4/1/2024	2/16/2024	4/1/2024	2/16/2024	4/1/2024	2/16/2024	4/1/2024
			Depth Range (feet)	0-0.25	0.25-0.5	0-0.25	0.25-0.5	0-0.25	0.25-0.5	0-0.25	0.25-0.5
			Units								
Metals (by SW846 6010D)											
Aluminum	NE	NE	mg/kg	--	13,000	--	13,000	--	17,000	--	14,000
Antimony	NE	5.1	mg/kg	--	<11 F1 F2 ^1+	--	<11 ^1+	--	<9.7 ^1+	--	<11 ^1+
Arsenic	20	2.9	mg/kg	--	2.7 J	--	2.2 J	--	4.3 J	--	4.3 J
Barium	NE	820	mg/kg	--	170	--	220	--	120	--	91
Beryllium	NE	4300	mg/kg	--	<5.4	--	<5.4	--	<4.8	--	<5.6
Cadmium	2	0.099	mg/kg	--	<4.3	--	<4.3	--	<3.9	--	<4.5
Calcuim	NE	NE	mg/kg	--	2,900 F1 F2	--	2,000	--	2,400	--	2,700
Chromium[2]	2000	1500	mg/kg	--	13	--	13	--	21	--	17
Cobalt	NE	NE	mg/kg	--	7.6	--	6.4	--	11	--	9.5
Copper	--	4.9	mg/kg	--	**7.2 J**	--	**6.2 J**	--	**14 J**	--	**22**
Iron	NE	500	mg/kg	--	**19,000**	--	**17,000**	--	**26,000**	--	**23,000**
Lead	250	500	mg/kg	--	13	--	12 J	--	16	--	18
Magnesium	NE	NE	mg/kg	--	4,600 F1	--	4,100	--	6,000	--	5,200
Manganese	NE	65	mg/kg	--	**520 F2**	--	**520**	--	**330**	--	**270**
Nickel	--	68	mg/kg	--	14	--	13	--	20	--	21
Potassium	NE	NE	mg/kg	--	1,800 F1 F2	--	1,900	--	3,400	--	2,200
Selenium	NE	0.52	mg/kg	--	<21	--	<21	--	<19	--	<22
Silver	--	0.54	mg/kg	--	<5.4	--	<5.4	--	<4.8	--	<5.6
Sodium	NE	NE	mg/kg	--	220 F1 F2 B	--	180 B	--	160 B	--	140 B
Thallium	NE	0.32	mg/kg	--	<11 ^1+	--	<11 ^1+	--	<9.7 ^1+	--	<11 ^1+
Vanadium	NE	NE	mg/kg	--	21	--	18	--	29	--	31
Zinc	--	120	mg/kg	**530,000 B**	76	**260 B**	120	**17,000 B**	70	**110,000 B**	80
Metals (by SW846 7471B)											
Mercury	2000	0.013	µg/kg	**--**	15 J F2	--	14 J	--	23 J	--	23 J

Notes:
1. Bolded and shaded values indicate the analyte was detected at a concentration at or above their respective cleanup levels.
2. Non-detect results are reported as "< Reporting Limit".

Footnotes:
[1] The respective cleanup level is less than the laboratory reporting limit. However, the analyte was not detected at concentrations greater than laboratory reporting limits.
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Acronyms and Abbreviations:
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µg/kg= microgram per kilogram
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ID = identification
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			Date	2/16/2024	4/1/2024	2/17/2024	4/1/2024	2/17/2024	4/1/2024	2/17/2024	4/1/2024
			Depth Range (feet)	0-0.25	0.25-0.5	0-0.25	0.25-0.5	0-0.25	0.25-0.5	0-0.25	0.25-0.5
			Units								
Metals (by SW846 6010D)											
Aluminum	NE	NE	mg/kg	--	14,000	--	7,500	--	13,000	--	14,000
Antimony	NE	5.1	mg/kg	--	<10 ^1+	--	<9.9 ^1+	--	<11 ^1+	--	<10 ^1+
Arsenic	20	2.9	mg/kg	--	4.2 J	--	2.4 J	--	<5.5	--	2.7 J
Barium	NE	820	mg/kg	--	92	--	49	--	93	--	110
Beryllium	NE	4300	mg/kg	--	<5.2	--	<4.9	--	<5.5	--	<5.1
Cadmium	2	0.099	mg/kg	--	<4.2	--	<3.9	--	<4.4	--	<4.1
Calcuim	NE	NE	mg/kg	--	2,800	--	2,000	--	2,100	--	2,100
Chromium[2]	2000	1500	mg/kg	--	15	--	8.0	--	10	--	10
Cobalt	NE	NE	mg/kg	--	8.2	--	4.2 J	--	5.7	--	6.5
Copper	--	4.9	mg/kg	--	**19**	--	**6.2 J**	--	**8.3 J**	--	**13 J**
Iron	NE	500	mg/kg	--	**22,000**	--	**14,000**	--	**16,000**	--	**17,000**
Lead	250	500	mg/kg	--	16	--	8.2 J	--	9.1 J	--	9.4 J
Magnesium	NE	NE	mg/kg	--	4,700	--	3,100	--	3,400	--	3,500
Manganese	NE	65	mg/kg	--	**330**	--	**150**	--	**180**	--	**210**
Nickel	--	68	mg/kg	--	18	--	8.1	--	12	--	14
Potassium	NE	NE	mg/kg	--	2,400	--	1,200	--	1,800	--	1,600
Selenium	NE	0.52	mg/kg	--	<21	--	<20	--	<22	--	<21
Silver	--	0.54	mg/kg	--	<5.2	--	<4.9	--	<5.5	--	<5.1
Sodium	NE	NE	mg/kg	--	180 B	--	110 B	--	180 B	--	160 B
Thallium	NE	0.32	mg/kg	--	<10 ^1+	--	<9.9 ^1+	--	<11 ^1+	--	<10 ^1+
Vanadium	NE	NE	mg/kg	--	27	--	16	--	16	--	16
Zinc	--	120	mg/kg	**960 B**	77	**17,000 B**	34	**1,100 B**	52	**230,000 B**	55
Metals (by SW846 7471B)											
Mercury	2000	0.013	µg/kg	--	23 J	--	<35	--	13 J	--	14 J

Notes:
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2. Non-detect results are reported as "< Reporting Limit".

Footnotes:
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			Date	2/17/2024	4/1/2024	2/17/2024	4/1/2024	2/17/2024	4/1/2024
			Depth Range (feet)	0-0.25	0.25-0.5	0-0.25	0.25-0.5	0-0.25	0.25-0.5
			Units						
Metals (by SW846 6010D)									
Aluminum	NE	NE	mg/kg	--	18,000	--	11,000	--	13,000
Antimony	NE	5.1	mg/kg	--	<9.3 ^1+	--	<10 ^1+	--	<10 ^1+
Arsenic	20	2.9	mg/kg	--	9.2	--	<5.2	--	2.8 J
Barium	NE	820	mg/kg	--	87	--	140	--	130
Beryllium	NE	4300	mg/kg	--	<4.7	--	<5.2	--	<5.2
Cadmium	2	0.099	mg/kg	--	0.25 J	--	<4.2	--	<4.1
Calcuim	NE	NE	mg/kg	--	4,700	--	3,200	--	3,200
Chromium[2]	2000	1500	mg/kg	--	24	--	9.6	--	12
Cobalt	NE	NE	mg/kg	--	13	--	5.3	--	7.3
Copper	--	4.9	mg/kg	--	**41**	--	**6.0 J**	--	**10 J**
Iron	NE	500	mg/kg	--	**36,000**	--	**16,000**	--	**18,000**
Lead	250	500	mg/kg	--	29	--	9.3 J	--	14
Magnesium	NE	NE	mg/kg	--	7,100	--	3,000	--	4,100
Manganese	NE	65	mg/kg	--	**500**	--	**420**	--	**470**
Nickel	--	68	mg/kg	--	34	--	12	--	14
Potassium	NE	NE	mg/kg	--	3,300	--	1,200	--	1,500
Selenium	NE	0.52	mg/kg	--	<19	--	<21	--	<21
Silver	--	0.54	mg/kg	--	<4.7	--	<5.2	--	<5.2
Sodium	NE	NE	mg/kg	--	240 B	--	210 B	--	260 B
Thallium	NE	0.32	mg/kg	--	<9.3 ^1+	--	<10 ^1+	--	<10 ^1+
Vanadium	NE	NE	mg/kg	--	44	--	14	--	19
Zinc	--	120	mg/kg	**80,000 B**	120	**19,000 B**	54	**570 B**	62
Metals (by SW846 7471B)									
Mercury	2000	0.013	µg/kg	--	42 J	--	13 J	--	11 J

Notes:
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Table 2
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Incident Response - February 2024
Hecla Mining
Ione, Washington

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			Date	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024	2/29/2024
			Depth Range (feet)	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25
			Units										
Metals (by SW846 6010D)													
Aluminum	NE	NE	mg/kg	12,000	18,000	9,800	12,000	9,200	15,000	16,000	13,000	14,000	13,000
Antimony	NE	5.10	mg/kg	<11	<13	<9.9 ^1+	<12 ^1+	<9.8 ^1+	<11	<9.4	<12 ^1+	<9.5 ^1+	<11 ^1+
Arsenic	20	2.9	mg/kg	4.8 J	4.5 J	5.1	5.6 J	7.0	3.8 J	4.6 J	4.9 J	5.0	4.0 J
Barium	NE	820	mg/kg	95	180	47	71	51	130	130	110	120	100
Beryllium	NE	4300	mg/kg	<5.5	<6.5	<5.0	<5.9	<4.9	<5.4	<4.7	<6.0	<4.7	<5.5
Cadmium	2	0.099	mg/kg	<4.4	0.39 J	<4.0	<4.7	0.28 J	0.43 J	0.27 J	0.31 J	0.31 J	<4.4
Calcuim	NE	NE	mg/kg	10,000 F1 F2	6,500	19,000 F2	27,000	16,000	5,800	9,600	30,000	19,000	14,000
Chromium[2]	2000	1500	mg/kg	15	20	16	18	13	17	19	18	18	16
Cobalt	NE	NE	mg/kg	7.5	10	6.9	9.4	7.3	8.3	11	10	10	9.0
Copper	--	4.9	mg/kg	**17 J**	**19 J**	**15 J**	**19**	**18**	**14 J**	**19**	**20**	**22**	**17 J**
Iron	NE	500	mg/kg	**18,000**	**23,000**	**18,000**	**22,000**	**19,000**	**21,000**	**25,000**	**23,000**	**23,000**	**21,000**
Lead	250	500	mg/kg	75	36	16	21	43	28	27	24	19	29
Magnesium	NE	NE	mg/kg	6,100 F1	6,500	9,500 F1	14,000	8,100	5,400	7,100	8,700	7,900	7,300
Manganese	NE	65	mg/kg	**430 ^1+**	**530 ^1+**	**310 ^1+**	**470 ^1+**	**420 ^1+**	**440 ^1+**	**680 ^1+**	**460 ^1+**	**560 ^1+**	**450 ^1+**
Nickel	--	68	mg/kg	15	20	16	20	15	18	21	21	21	18
Potassium	NE	NE	mg/kg	2,200	3,500	1,300	1,900	1,500	2,300	2,600	2,200	2,000	1,900
Selenium	NE	0.52	mg/kg	<22	<26	<20	<24	<20	<22	<19	<24	<19	<22
Silver	--	0.54	mg/kg	<5.5	<6.5	<5.0	<5.9	<4.9	<5.4	<4.7	<6.0	<4.7	<5.5
Sodium	NE	NE	mg/kg	250 ^1+	260 ^1+	150	130	110	220 ^1+	180 ^1+	120	110	140
Thallium	NE	0.32	mg/kg	<11	<13	<9.9 ^1+	<12 ^1+	<9.8 ^1+	<11	<9.4	<12 ^1+	<9.5 ^1+	<11 ^1+
Vanadium	NE	NE	mg/kg	23	32	22	29	19	29	39	30	31	27
Zinc	--	120	mg/kg	95	**130**	68	84	96	110	96	87	85	94
Metals (by SW846 7471B)													
Mercury	2000	0.013	µg/kg	31 J	45 J	17 J F1	19 J	14 J	38 J	23 J	29 J	32 J	33 J

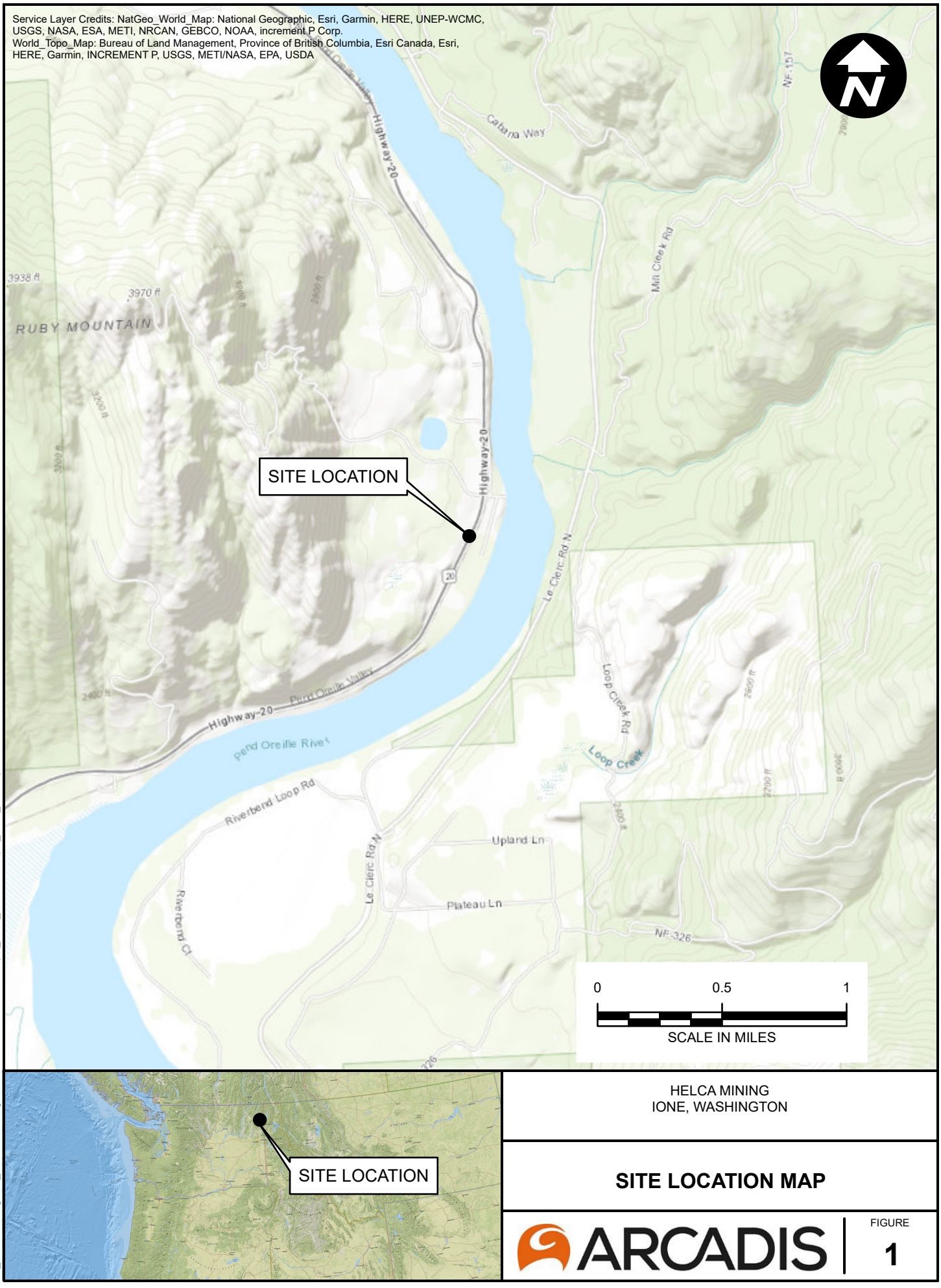
Notes:
1. Bolded and shaded values indicate the analyte was detected at a concentration at or above their respective cleanup levels.
2. Non-detect results are reported as "< Reporting Limit".

Footnotes:
[1] The respective cleanup level is less than the laboratory reporting limit. However, the analyte was not detected at concentrations greater than laboratory reporting limits.
[2] Total chromium was analyzed and the cleanup level presented is for chromium III.

Data Qualifiers:
< = The analyte was analyzed for but not detected. The associated value is the analyte reporting limit.
J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery exceeds control limits.
F2 = MS/MSD relative percent difference (RPD) exceeds control limits.
^1+ = Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

Acronyms and Abbreviations:
-- = Not analyzed/not available
µg/kg= microgram per kilogram
CUL = cleanup level
ID = identification
mg/kg = milligram per kilogram
MTCA = Model Toxics Control Act
NE = not established
SW846 = United States Environmental Protection Agency "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Figures



CITY: NOVI, MI DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: 30216383 COORDINATE SYSTEM: NAD 1983 StatePlane Washington North FIPS 4601 Feet
T:_ENV\NoviBrighton_MI\HelcaMining\CusickWA\Documents\TruckSpill_2024_0216\TruckSpill_2024_0216.aprx PLOTTED: 4/12/2024 3:40 PM BY: AKENS

HELCA MINING
IONE, WASHINGTON

SITE LOCATION MAP

ARCADIS

FIGURE
1

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, and the GIS User Community

IONE-1-021624	IONE-1A-040124
2/16/2024	4/1/2024
530,000	76

IONE-2-021624	IONE-2A-040124
2/16/2024	4/1/2024
260	120

IONE-5-021624	IONE-5A-040124
2/16/2024	4/1/2024
960	77

IONE-4-021624	IONE-4A-040124
2/16/2024	4/1/2024
110,000	80

IONE-9-021724	IONE-9A-040124
2/17/2024	4/1/2024
80,000	120

IONE-8-021724	IONE-8A-040124
2/17/2024	4/1/2024
230,000	55

IONE-11-021724	IONE-11A-040124
2/17/2024	4/1/2024
570	62

IONE-10-021724	IONE-10A-040124
2/17/2024	4/1/2024
19,000	54

IONE-3-021624	IONE-3A-040124
2/16/2024	4/1/2024
17,000	70

IONE-6-021724	IONE-6A-040124
2/17/2024	4/1/2024
17,000	34

IONE-7-021724	IONE-7A-040124
2/17/2024	4/1/2024
1,100	52

051-443532519036
STEVEN G BANICH

051-443532519037
STEVEN G BANICH

051-443532090001
PEND OREILLE
COUNTY FIRE

051-443532519038
DONALD L SMITH

051-443532519039
DONALD L SMITH

051-443532519040
STEVEN G BANICH

LEGEND

- SAMPLES COLLECTED ON 2/16 - 17/2024
- SAMPLES COLLECTED ON 4/1/2024
- PARCEL BOUNDARY (STATE OF WASHINGTON 2022)
- EXCAVATION BOUNDARY
- PEND OREILLE VALLEY RAILROAD

120 = ZINC CONCENTRATION (MILLIGRAM/KILOGRAM)

530,000 = ZINC WAS DETECTED AT A CONCENTRATION ABOVE THE CLEANUP LEVEL

NOTES:
1. SAMPLES COLLECTED ON 2/16 - 17/24 WERE COLLECTED AT APPROXIMATELY 0-0.25 FEET BELOW GROUND SURFACE (BGS).
2. SAMPLES COLLECTED ON 4/1/24 WERE COLLECTED AT APPROXIMATELY 0-0.25 FEET BGS.

N

0 30 60

SCALE IN FEET

HELCA MINING
IONE, WASHINGTON

SOIL SAMPLE LOCATIONS AND RESULTS MAP

ARCADIS

FIGURE
2

CITY: NOVI, MI DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Washington North FIPS 4601 Feet
T:_ENV\NoviBrighton_MI\HelcaMining\CusickWA\Documents\TruckSpill_2024_0216\TruckSpill_2024_0216.aprx PLOTTED: 4/19/2024 10:52 AM BY: AKENS

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, and the GIS User Community

BG-5-022924
BG-4-022924
BG-3-022924
BG-2-022924
BG-1-022924
BG-6-022924
BG-7-022924
BG-8-022924
BG-9-022924
BG-10-022924

051-443532519034
051-443532519035 STEVEN G BANICH
051-443532519036 STEVEN G BANICH
051-443532519037 STEVEN G BANICH
051-443532519038 DONALD L SMITH
051-443532519039 DONALD L SMITH
051-443532519040 STEVEN G BANICH
051-443532519041 DOUGLAS R MATTESON
051-443532519042 DAN AND ABRA BLAKE
051-443532519043 DAN AND ABRA BLAKE
051-443532090001 PEND OREILLE COUNTY FIRE
051-443532519007 NICOLE M HUGHES AND WAYDE R CORNWELL
051-443532519006 STEVEN G BANICH
051-443532519005 DONALD L SMITH
051-443532519004 DONALD L SMITH
051-443532519003 MICHAEL D AND SOMMER L MUNSEN
051-443532519002 MICHAEL AND LORI CASTRO
051-443532519001 CARL L WILSON

LEGEND

- BACKGROUND SOIL SAMPLE LOCATION
- PARCEL BOUNDARY (STATE OF WASHINGTON 2022)
- EXCAVATION BOUNDARY
- PEND OREILLE VALLEY RAILROAD

N

0 60 120

SCALE IN FEET

HELCA MINING
IONE, WASHINGTON

BACKGROUND METALS SOIL SAMPLE LOCATIONS

ARCADIS

FIGURE
3

CITY: NOVI, MI DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Washington North FIPS 4601 Feet
T:_ENV\NoviBrighton_MI\HelcaMining\CusickWA\Documents\TruckSpill_2024_0216\TruckSpill_2024_0216.aprx PLOTTED: 4/12/2024 3:40 PM BY: AKENS

Appendix A

Zinc Concentrate Safety Data Sheet

HECLA LUCKY FRIDAY

HECLA LUCKY FRIDAY ZINC CONCENTRATE
SAFETY DATA SHEET

1. Product and company identification	
1.1. GHS Product identifier	Zinc sulfide concentrate
1.2. Other means of identification	Hecla Lucky Friday Zn concentrate
1.2. Recommended use of the chemical and restrictions on use	Zinc sulfide concentrates are used for smelter feedstock.
1.3. Details of the supplier of the safety data sheet	
Supplier:	Hecla Lucky Friday Mine, P.O. Box 31, Mullan, ID 83846 USA
Telephone:	(208) 744-1751
Telefax:	(208) 744-1317
E-mail:	bkucera@hecla-mining.com
1.4. Emergency telephone number	(208) 661-5247 (LFM Env Mgr) (800) 424-9300 (Transportational Emergencies - CHEMTREC)
2. Hazard identification	
2.1. GHS classification of the substance/mixture and any regional information.	
Aquatic toxicity (acute): category 4	H402: Harmful to aquatic life.
Aquatic toxicity (chronic): category 4	H413: May cause long lasting harmful affects to aquatic life.
Reproductive toxicity: category 1A	H360: May damage fertility or the unborn child. However, extent of specific effect on reproductivity is unknown. Inhalation and ingestion are suspected primary routes of exposure although not conclusively proven to satisfactory demonstration that no other routes of exposure cause hazards.
Specific target organ toxicity - repeated exposure: category 2	H373: May cause damage to organs through prolonged or repeated exposure. However, the extent of organs affected are not currently known due to prolonged or repeated exposure.
2.2. GHS label elements, including precautionary statements.	
Signal word	DANGER

Symbols - pictograms	
Precautionary statements	
	General
	P101: If medical advice is needed, have product container or label at hand.
	P102: Keep out of reach of children.
	Prevention
	P201 – Obtain special instructions before use.
	P202 – Do not handle until all safety precautions have been read and understood.
	P210 - Keep away from open flames. No Smoking.
	P260 – Do not breathe dust.
	P263: Avoid contact during pregnancy and nursing.
	P264: Wash affected areas of contact thoroughly after handling.
	P273 - Avoid release to the environment.
	P281 - Use personal protective equipment as required.
	Response
	P301: IF SWALLOWED: give water or milk and induce vomiting. Do not induce vomiting or give liquid to an unconscious person.
	P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
	P308 + P313 - IF exposed or concerned: Get medical advice.
	P333+313: If skin irritation or a rash occurs: Get medical advice.
	P370+380: In case of fire: Evacuate area
	P391 - Collect spillage.
	Storage
	P401: Store on not water-permeable floor
	P405 - Store locked up.
	Disposal
	P501 - Dispose of contents to zinc refinery or waste treatment facility.
2.3. Other hazards which do not result in classification or are not covered by the GHS.	Dust may irritate eyes and respiratory but the zinc (iron-lead-cadmium) sulfide in the product has not been classified as risk causing. Metal sulfides, when heated, may release sulphur dioxide, which will irritate the upper respiratory tract. Conditions and work practices which generate dust and fume should be controlled or avoided. Primary routes of exposure are inhalation and ingestion. 1-4% of mixture consists of ingredients of unknown hazards to the aquatic environment.
	The substance does not meet the criteria for a PBT or vPvB substance.

3. Composition/in-formation on ingredients

Hazardous ingredient	Approximate percent by weight	CAS Number
Zinc sulfide	50 to 65 %	1314-98-3
Iron sulfide	5 to 10 %	1317-37-9
Lead sulfide	1 to 4 %	1314-87-0
Copper	<0.1 %	1317-40-4

Arsenic	0,1 to 0,3 %	7440-38-2
Cadmium sulfide	0,1 to 0,4%	1306-23-6
Silica	0,1 to 1 %	14808-60-7
	This product is a concentrate of the zinc sulfide mineral, SPHALERITE, containing mostly zinc and sulphur. Chemical composition of mineral is ZnS. The concentrate also contains small quantities of other minerals, namely: Pyrites (FeS2), Galena (PbS) and Chalcopyrite (CuFeS2). Name of product: Zinc concentrate Grade: >80% Mineral (Zn>54%) Occupational Exposure Limit: Refer to Section 8.1.	

4. First-aid measures

Inhalation	Remove victim from exposure area to fresh air immediately. If breathing has stopped, trained personnel should begin artificial respiration. Medical oxygen may be administered by trained personnel, where breathing is difficult. If the heart has stopped, immediately start cardiopulmonary resuscitation (CPR), or automated external defibrillation (AED). Quickly transport victim to an emergency care facility.
Skin Contact	Wash thoroughly affected areas with soap and water. If skin irritation or a rash occurs: Get medical advice/attention
Eye contact.	Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. Dust may act as a foreign body. Treat as foreign body.
Ingestion	Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 2 – 8 oz. (60 – 240 ml) of water. If vomiting occurs naturally, have victim rinse mouth with water again. Obtain medical advice and bring a copy of this SDS. May irritate the gastro-intestinal tract and may cause nausea, vomiting and diarrhea. If ingested, remove by gastric lavage. Chelation therapy has been shown to be effective with lead and may be indicated.

5. Firefighting measures

5.1. Suitable extinguishing media.	If product is burning, use DRY chemical, CO_2, water spray or foam to extinguish the fire. If material near product is burning, use extinguishing media appropriate for the situation. Do not use high velocity water streams or extinguishers, which may spread burning concentrate.
5.2. Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products).	Ignition temperature: 700-800°C. Product has not been shown to be combustable, however pure lead sulfide dust, at sufficient concentration, is combustible. Product is not considered a fire or explosion hazard. However, concentrate will burn if strongly heated in a fire situation, releasing toxic and irritating sulphur dioxide gas (SO2) and harmful fumes containing metal oxides (PbOx and ZnOx). Contact with strong acids will generate flammable and highly toxic hydrogen sulfide gas (H2S).
5.3. Special protective equipment and precautions for fire-fighters.	Fire fighters should wear positive- pressure self-contained breathing apparatus (SCBA) and wear full protective clothing. Hazardous combustion products include sulphurdioxide , cadmium oxide, zinc oxide and metallic oxides. Mists and vapors from the fire may be corrosive. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Concentrate has no visible flames. Discoloration is evident. Prevent contamination of drains and waterways, absorb runoff with sand or similar.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures.	Avoid generating dust. In case an abundance of concentrate dust is in the air, a full cover mask with a minimum of class P2 dust filter, fresh air hood, or pressurized respiratory equipment is to be used. Danger of dust explosion is to be taken into account. In hazardous situations safety glasses are to be worn. Protection gloves (e.g. PVC, Rubber, Nitrile) and other necessary protective clothing to be used when needed.
6.2. Environmental precautions.	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.
6.3. Methods and materials for containment and cleaning up.	Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Returned to the process cycle or dispose of via a licensed waste disposal contractor.

7. Handling and storage

7.1. Precautions for safe handling.	In confined space, this concentrate may oxidize itself causing a lack of oxygen in the immediate environment and could cause asphyxia. Before entering a confined space check to see if there is sufficient oxygen, if not wear a self contained breathing apparatus (SCBA). Keep away from heat. Keep away from sources of ignition. Do not ingest. Do not breathe dust. Wear suitable protective clothing. Avoid use of contact lenses. Keep away from incompatibles such as strong oxidizing agents and concentrated acids. Employee work practices should include thorough hand washing before eating and drinking, smoking or using the toilet, showering at end of exposure and it is advisable to have separate street and work clothes. It is not advisable to eat, drink or smoke in an area where this product is in use or stored.
7.2. Conditions for safe storage, including any incompatibilities.	Store in a manner that will prevent dusting and release to the environment. Store away from all heat and possible ignition sources. Store away from incompatible substances. Strong oxidants and concentrated acids must be prevented to get in contact with this product unless intended in the process.

8. Exposure controls/personal protection

8.1. Control parameters (e.g., occupational exposure limit values or biological limit values).	Zinc 8hr -TWA 10 (mg/m³) (zinc oxide dust) Iron 8hr -TWA 5 (mg/m³) (iron oxide fume) Lead 8 hr-TWA 0.15 (mg/m³) (inorganic dust and fumes) Cadmium 8 hr-TWA 0.025 (mg/m³) (cadmium and compounds) LEAD (7439-92-1) ES-TWA: 0.15 mg/m3 (Lead) WES-TWA: 0.1 mg/m3 SILICA, CRYSTALLINE - QUARTZ (14808-60-7) ES-TWA: 0.1 mg/m3 (Silica Quartz, respirable, NOHSC) ES-TWA#: 0.1 mg/m3 (QLD); 0.15 mg/m3 (NSW) WES-TWA: 0.2 mg/m3 CADMIUM (7440-43-9) ES-TWA: 0.01mg/m3 Cadmium WES-TWA: 0.01mg/m3 IRON (7439-89-6) ES-TWA: 5 mg/m3 Iron oxide fume
8.2. Appropriate engineering controls.	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, use local or extraction ventilation at source. Maintain dust levels below the recommended exposure standard.

8.3. Individual protection measures, such as personal protective equipment.	Coveralls or other work clothing and gloves (e.g. PVC, Rubber, Nitrile) are recommended to prevent prolonged or repeated direct skin contact. Work clothing should be removed immediately if it becomes heavily contaminated and should be changed daily and laundered before reuse if there is reasonable probability that the clothing may be contaminated. Close-fitting safety goggles should be worn to prevent eye contact if excessive dust is generated or where any possibility exists that eye contact may occur. Workers should wash immediately when skin becomes contaminated and at the end of each work shift. Where zinc concentrate dust is generated and cannot be controlled to within acceptable levels by engineering means and inhalation risk exists, wear a Class P2 - Particulate respirator (e.g. half face canister P2 or disposable P2). Where vapours are generated, wear a Type BE (Inorganic and acid gas, Sulphur dioxide) respirator or Full-face Air-line respirator (in confined areas).

9. Physical and chemical properties

Appearance (physical state, colour, etc.)	Brown to grey fine powder,
Odour	Weak organic odour from entrained flotation agents can occur.
Odour threshold	Not applicable
pH	7,5 to 8,5
melting point/freezing point	not relevant
initial boiling point and boiling range	> 1000°C
flash point:	Not available
evaporation rate	Not applicable
flammability (solid, gas)	non flammable
upper/lower flammability or explosive limits	Not applicable
vapour pressure	Not applicable
vapour density	Not applicable
relative density:	4.0 - 4.3 (bulk density: 2.0 - 2.3)
solubility(ies)	low solubility
partition coefficient: *n* - octanol/water	Not applicable
auto-ignition temperature	Not available
decomposition temperature	700°C - 800°C

10. Stability and reactivity

10.1. Chemical stability.	Stable under recommended conditions of storage. Hazardous polymerization or runaway reactions will not occur.
10.2. Possibility of hazardous reactions.	Product decomposes only at elevated temperature (>700°C) in presence of oxygen with formation of metal oxides and suphur dioxide gas.
10.3. Conditions to avoid (e.g., static discharge, shock or	Avoid high temperatures or direct flame in contact with the product
10.4. Incompatible materials,	Incompatible with strong acids (forming toxic and flammable hydrogen sulfide gas) and oxidising agents (eg. hypochlorites, peroxides).
10.5. Hazardous decomposition products.	May evolve toxic sulphur dioxide, hydrogen sulfide, cadmium and lead oxides when heated to decomposition. May also evolve iron oxides when heated to decomposition.

11. Toxicological information

Health hazard summary	Moderate toxicity. Use safe work practices to avoid direct eye or skin contact and dust inhalation. Lead and cadmium are cumulative poisons. Crystalline silica and cadmium are classified as carcinogenic to humans (IARC Group 1). Inorganic lead compounds are classified as probably carcinogenic to humans (IARC Group 2A). Lead may cause reproductive effects, anaemia, kidney damage and nerve damage.
Acute toxicity	Inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin, and by inhalation. Use safe work practices to avoid eye contact and dust inhalation; Nevertheless current EU regulations require this substance to be classified as harmful by ingestion and inhalation. Toxicity data for lead monoxide: LD50 (oral, rat) > 2000 mg/kg LD50 (dermal, rat) >2000mg/kg LC50 (4 hr inhalation, rat) > 5mg/L
Skin/eye	Irritant to skin. Prolonged and repeated contact may result in skin rash, dermatitis and skin discolouration. Eye contact with dust may cause local irritation, pain and redness but would not cause tissue damage.
Inhalation	Toxic - irritant. Dust inhalation may cause irritation with coughing. Chronic or high level dust or fume inhalation may cause lead and/or cadmium poisoning. These metals are cumulative toxins; avoid all exposure.
Ingestion	Moderate toxicity. Ingestion may result in irritation, nausea, constipation, diarrhea and vomiting. Lead and cadmium are cumulative poisons, and accidental ingestion of small quantities (eg through poor hygiene) may be significant.
Chronic	The chronic health effects of zinc concentrate (which also contains lead, cadmium, and arsenic in a mineral complex), have not been fully investigated. Prolonged exposure to zinc concentrate dust may be expected to produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, kidney dysfunction, anemia, and possible skin rashes or dermatitis. Reduced hemoglobin production has been associated with low lead exposures. Symptoms of central nervous system damage due to moderate exposure include fatigue, headaches, tremors and hypertension. Very high exposure can result in lead encephalopathy with symptoms of hallucinations, convulsions, and delirium. Kidney dysfunction and possible injury has also been associated with chronic lead and cadmium poisoning. Chronic over-exposure to lead has been implicated as a causative agent for the impairment of male and female reproductive capacity. Pregnant women should be protected from excessive exposure as lead can cross the placental barrier and unborn children may suffer neurological damage or developmental problems. Teratogenic and mutagenic effects from exposure to lead have been reported in some studies but not in others. The literature is inconsistent and no firm conclusions can be drawn at this time. Lead and lead compounds are listed as an A3 Carcinogen (Confirmed Animal Carcinogen with Unknown Relevance to Humans) by the ACGIH. IARC has listed lead compounds as Group 2A Carcinogens (Probably Carcinogenic to Humans) while lead metal is listed as Group 2B (Possibly Carcinogenic to Humans). The NTP has recently listed lead and lead compounds as Reasonably Anticipated to be a Human Carcinogen. OSHA and the EU do not currently list lead as a human carcinogen. IARC has classified cadmium and certain cadmium compounds as a Group 1 Carcinogen (Carcinogenic to Humans) while ACGIH classifies cadmium as a Suspected Human Carcinogen (A2). The NTP classifies cadmium as a Known Human Carcinogen and OSHA lists cadmium as a Carcinogen. The European Union (EU) classifies cadmium sulfide as a Category 3 (Possible) Carcinogen.

	Arsenic and inorganic arsenic compounds are listed as an A1 Carcinogen (Confirmed Human Carcinogen) by the ACGIH and as a Group 1 Carcinogen (Carcinogenic to Humans) by IARC. The NTP and OSHA also identify arsenic and inorganic arsenic compounds as Known Human Carcinogens. The EU also considers some compounds of arsenic, including arsenic oxides, to be Carcinogenic. IARC has classified crystalline silica of respirable particle size as a Group 1 Carcinogen (Carcinogenic to Humans) while ACGIH classifies it as a Suspected Human Carcinogen (A2). The NTP recently reclassified silica as a Known Human Carcinogen. OSHA and the EU do not list silica as a carcinogen.
Mutagenicity	The evidence for genotoxic effects of lead is contradictory, with numerous studies reporting both positive and negative effects. Responses appear to be induced by indirect mechanisms, mostly at very high concentrations that lack physiological relevance.
Carcinogenicity	An inhalation study of lead oxide in rats showed that it did not induce, initiate or promote tumours of the lung. However, there is evidence that lead compounds may have a carcinogenic effect, particularly on the stomach and kidneys. However, the mechanisms by which this effect occurs are still unclear. This has led to the classification by IARC that inorganic lead compounds are probably carcinogenic to humans (Group 2A). Crystalline silica, arsenic and cadmium are classified as carcinogenic to humans (IARC Group1).
Reproductive	Exposure to high levels of lead and its compounds may cause adverse effect on male and female fertility, including adverse effects on sperm quality. Prenatal exposure to lead and its compounds is also associated with adverse effects on neurobehavioral development in children.
STOT – single exposure	Zinc and inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin, and by inhalation, with no evidence of any local or systemic toxicity from such exposures.
STOT – repeated exposure	Lead is a cumulative poison and may be absorbed into the body through ingestion or inhalation. Lead has been documented in observational human studies to produce toxicity in multiple organ systems and body function including the haematopoietic (blood) system, kidney function, reproductive function and the central nervous system. Chronic exposure to crystalline silica may result in lung fibrosis (silicosis) with early symptoms; cough, wheezing and with progression, increasing shortness of breath.

12. Ecological information

12.1. Ecotoxicity (aquatic and terrestrial, where available).	The environmental effects of this substance have been assessed using read-across from studies with similar composition. Toxicity will depend on the levels of free lead and free zinc ions in solution, which in turn is affected by pH, water hardness, salinity, etc. Lead toxicity is expected to be greater in softer waters. The aquatoxic classification of the zinc concentrate according UN-GHS 4th rev 2011, is acute 2, chronic 3
12.2. Persistence and	Lead compounds are potentially persistent in the aquatic environment.
12.3. Bioaccumulative potential	Dissolved lead compounds have the potential to bioaccumulate in plants and animals, both aquatic and terrestrial. In aquatic systems, zinc bioaccumulates in both plants and animals. Zinc also bioaccumulates in terrestrial plants, vertebrates, and mammals; plant uptake from soil depends upon the plant species, soil pH, and soil composition. In general, zinc does not biomagnify through food chains.
12.4. Mobility in soil	Lead may occur as sorbed ions or surface coatings on sediment mineral particles, or may be carried in colloidal particles in surface water. Most lead is strongly retained in soil, resulting in relatively low mobility. Lead may be immobilized by ion exchange with hydrous oxides or clays or by chelation with humic or fulvic acids in the soil.
12.5. Other adverse effects	The PBT and vPvB criteria in Annex XIII of the REACH Regulation do not apply to inorganic substances.

13. Disposal considerations

13.1. Description of waste residues and information on their safe handling and methods of disposal, including any contaminated packaging.	Spilled material should be swept up, placed in suitable containers and returned to the process cycle. Endeavour to separate cleanup materials from clean product. Wastes will be forwarded to be destroyed according to prevailing waste regulations. If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations. Do not dispose of product to landfill, sewage system or drains. Must be disposed as hazardous chemical waste. Do not allow product to reach sewage system. European waste catalogue: 06 03 13* solid salts and solutions containing heavy metals or 06 04 05* wastes containing other heavy metals

14. Transport information

14.1. UN number.	UN3077
14.2. UN Proper shipping name.	Environmentally Hazardous Substance, solid, n.o.s.
14.3. Transport Hazard class(es).	Class 9
14.4. Packing group, if applicable.	III
14.5. Marine pollutant (Y/N).	N
14.6. Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises.	**Risks**: This material may liquefy if shipped at moisture content in excess of its transportable moisture limit. 1-4% of mixture consists of ingredients of unknown hazards to the aquatic environment. 1-4% of mixture consists of ingredients of unknown toxicity.

15. Regulatory information

15.1. Safety, health and environmental regulations specific for the product in question.	
Hazard phrases (GHS)	H401 - Toxic to aquatic life
	H412 - Harmful to aquatic life with long lasting effects
	H360 - May damage fertility or the unborn child
	H373 - May cause damage to organs through prolonged or repeated exposure through prolonged or repeated exposure
Precautionary phrases (GHS)	P101: If medical advice is needed, have product container or label at hand
	P102: Keep out of reach of children
	P201 – Obtain special instructions before use.
	P202 – Do not handle until all safety precautions have been read and understood.
	P210 - Keep away from open flames
	P260 – Do not breathe dust/fume
	P273 - Avoid release to the environment.
	P281 - Use personal protective equipment as required.
	P301: IF SWALLOWED: give water or milk and induce vomiting. Do not induce vomiting or give liquid to an unconscious person.
	P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

	P308 + P313 - IF exposed or concerned: Get medical advice/attention.
	P333+313: If skin irritation or a rash occurs: Get medical advice/attention
	P370+380: In case of fire: Evacuate area
	P391 - Collect spillage.
	P401: Store on not water-permeable floor
	P405 - Store locked up.
	P501 - Dispose of contents to proces or in accordance with relevant regulations.

16. Other information

16.1. Created	20-Jun-14
16.2. Revised	
16.3. Addtional information	**RESPIRATORS**: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.
	EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).
	PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this SDS is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.
	HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare an SDS which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.
16.3. Abbreviations and acronyms	mg/m3 - Milligrams per cubic metre ppm - Parts Per Million TWA - Time Weighted Average ES - Exposure Standard. pH - relates to hydrogen ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline. CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds. M - moles per litre, a unit of concentration. IARC - International Agency for Research on Cancer. ACGIH - AMerican conference of industrial Hygienists PBT - Persistent, bio-accumulative and toxic vPvB - Very Persistent, Very bio-accumulative SDS - Safety Data Sheet STOT - Specific Target Organ Toxicity

16.4. Key literature reference	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Fourth revised Edition, Copyrighted United Nations, 2011.
16.5. Training advice	In addtion to health, safety and environmental training programs for their workers, companies must ensure that workers read, understand and apply the requirements of this SDS.
16.6. Disclaimer	The information is based on the latest chemical and toxicological research and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. This document is not all-inclusive and does not represent any guarantee as to the properties of the product. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer. While IZA has taken all due care to include accurate and up-to-date information in this document, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, IZA accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this document.
16.7. Prepared by	Hecla Mining Company in consultation with: Internatiol Zinc Association (IZA) 168, Avenue de Tervueeren:Box4 B-1150 Brussels, Belgium Phone: +32 (0)2 776 0070 Phone: +32 (0)2 776 0089 E-mail: contact@zinc.org Web: www.zinc.org IZA information has been supplemented with basis of credible human experience supported by knowledge gained through environmental cleanups, after action investigations, Whole Effluent Toxicity Testing, and annual bioassessment of effluent receiving waters performed by mineral beneficiator and concentrating facility (Hecla Mining Company).

Appendix B

Regulatory Correspondence

Archived: Tuesday, May 14, 2024 2:29:04 PM
From: Fulton, Sara (ECY)
Sent: Wed, 20 Mar 2024 20:39:50 +0000ARC
To: Lee, Joshua
Cc: Loftenius, Christer (ECY)
Subject: RE: Zinc Con Release
Sensitivity: Normal

Hi Josh,

We tested the other six background samples and the zinc concentrations do not exceed Ecology's requested cleanup level of 120 mg/kg. Please see attached draft analytical tables and draft background sample locations figure. We have one sample (BG-2-022924) located about 100 feet north of the excavation that exceeds the 120 mg/kg cleanup level. Will this modify the requested cleanup level? No. 120 mg/kg is adequate for the cleanup level.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Tuesday, March 19, 2024 11:02 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

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I am working to schedule the contractor for our next excavation at the site; hopefully, this follow-up excavation will be scheduled for next week or the following week. I will contact Ecology with the scheduled excavation date. We plan to screen soil using an XRF during this follow-up excavation.

Thanks,
Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Tuesday, March 5, 2024 2:03 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Should we test the other six samples for TAL metals for a larger sample set? YES

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Tuesday, March 5, 2024 1:23 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

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Thanks,

Josh

From: Lee, Joshua

Sent: Wednesday, February 28, 2024 12:41 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

We are planning to head out to the Ione, WA site tomorrow to collect ten soil samples from north and south of the remedial excavation (50-foot spacing between samples). We will start with submitting four of these samples for TAL metals analysis to check the background metals concentrations; the other six samples will be held at the lab.

The site location is 48.4852933, -117.2703799 and I have attached a draft figure of the excavation with initial confirmation sample locations. Our confirmation sample results were tested for Metals-Zn and ranged from 260 to 530,000 mg/kg zinc. We plan to use TAL metals analysis for confirmation sampling when we continue the remedial excavation. I will let you know when we have the remedial excavation scheduled.

Thanks,

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To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Josh,

Take at least four samples along the railroad line away from the spill and use the results from this analysis to calculate a background (I would prefer 10 samples). Collect 10 samples along the railroad line away from the spill.

Refer to WAC 173-340-709.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Monday, February 26, 2024 5:08 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

External Email

Hi Sara,

Thanks, I received the email. We are planning the next phase of the remedial excavation in Ione, WA. I have been discussing with our risk assessors and looking into background concentrations via the Natural Background Soil Metals Concentrations in Washington State 1994 document, but that document indicates zinc concentrations between 10-100 mg/kg for most of the state. We are concerned that the railroad ROW in this area has historically hauled zinc and lead concentrate so we might have higher background concentrations. What would Ecology require for us to investigate the background concentrations?

Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Monday, February 26, 2024 4:57 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Subject: FW: Zinc Con Release

> You don't often get email from sful461@ecy.wa.gov. Learn why this is important

See email below.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Fulton, Sara (ECY)
Sent: Friday, February 23, 2024 12:06 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Josh,

After reviewing the information provided by Ecology Spills, I would say to use the Soil Protective of Groundwater to Surface Water Vadose @13 degrees C Freshwater of 120 mg/kg. Also, should test for EPA's target analyte list of 23 metals (TAL) using the same Soil Protective of Groundwater to Surface Water Vadose.

Target Analyte List (TAL) *Metals and Cyanide*	
Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

If you have any additional information that might prove contrary to the use of these CULs, let me know and send it my way for review.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Wednesday, February 21, 2024 8:00 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: Fwd: Zinc Con SDS

External Email

Hi Sara,

See attached zinc concentrate SDS for the Ione, WA cleanup.

Thanks,

Josh

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Archived: Tuesday, May 14, 2024 2:29:08 PM
From:
To:
Cc:
Subject: RE: Zinc Con Release (Analytical Results 4/10/2024)
Sensitivity: Normal
Attachments:
J24019-1 UDS Level 2 Report Final Report.pdf

Hi Sara,

We received the attached lab report for confirmation samples collected at the Hecla - Ione, WA spill site. The contractor scraped another 3-4 inches from the entire excavation area and hauled four truck and pup trailers full of soil for disposal. Arcadis field screened with an XRF and collected 11 confirmation samples from the approximate locations of the original 11 confirmation samples. At first glance, I think we are ok with the zinc analytical results. The other metals results appear ok, but we need to tabulate these results and compare to respective cleanup levels. Two confirmation samples were right at the zinc cleanup level of 120 mg/kg, but these concentrations did not exceed the cleanup level. The POVA railroad inspected the site, and the excavation area will not require further restoration. Arcadis will finish up the spill response report and submit to Ecology for review.

Thanks,

Josh Lee, EIT I CPM I Environmental Engineer
Arcadis U.S., Inc,
1219 E 32nd Avenue
Spokane, Washington 99203
M. + 1 406.239.7810; O. +1 206.413.6537
www.arcadis.com

ARCADIS

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Friday, March 29, 2024 9:19 AM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release (Remedial Ex 4/1/2024)

Thanks for the update.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street

Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Thursday, March 28, 2024 11:45 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release (Remedial Ex 4/1/2024)

External Email

Hi Sara,

We have rescheduled the next phase of remedial excavation at the Hecla Ione, WA site for Monday, April 1. This schedule will allow for better weather and the excavation area can dry out over the weekend. We plan to start at 0800 on Monday and begin loading trucks with soil at 10:00. I will be at the site to screen soil with an XRF and collect confirmation samples.

Thanks,

Josh

From: Lee, Joshua
Sent: Wednesday, March 20, 2024 1:44 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Ooops…I meant next Friday, March **29**.

Josh

From: Lee, Joshua
Sent: Wednesday, March 20, 2024 1:43 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

Ok, thank you for the response. We are tentatively scheduled for continuing excavation at the Ione, WA site next Friday, March 22. This second phase of excavation is dependent on weather and contractor availability; I will let you know if the schedule changes.

Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Wednesday, March 20, 2024 1:40 PM

To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

> You don't often get email from sful461@ecy.wa.gov. Learn why this is important

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Sent: Wednesday, February 28, 2024 12:41 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
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Subject: RE: Zinc Con Release

Josh,

After reviewing the information provided by Ecology Spills, I would say to use the Soil Protective of Groundwater to Surface Water Vadose @13 degrees C Freshwater of 120 mg/kg. Also, should test for EPA's target analyte list of 23 metals (TAL) using the same Soil Protective of Groundwater to Surface Water Vadose.

Target Analyte List (TAL) *Metals and Cyanide*	
Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

If you have any additional information that might prove contrary to the use of these CULs, let me know and send it my way for review.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Wednesday, February 21, 2024 8:00 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: Fwd: Zinc Con SDS

External Email

Hi Sara,

See attached zinc concentrate SDS for the Ione, WA cleanup.

Thanks,

Josh

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Archived: Tuesday, May 14, 2024 2:29:12 PM
From: Fulton, Sara (ECY)
Sent: Fri, 29 Mar 2024 16:19:08 +0000ARC
To: Lee, Joshua
Cc: Loftenius, Christer (ECY)
Subject: RE: Zinc Con Release (Remedial Ex 4/1/2024)
Sensitivity: Normal

Thanks for the update.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Thursday, March 28, 2024 11:45 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release (Remedial Ex 4/1/2024)

External Email

Hi Sara,

We have rescheduled the next phase of remedial excavation at the Hecla Ione, WA site for Monday, April 1. This schedule will allow for better weather and the excavation area can dry out over the weekend. We plan to start at 0800 on Monday and begin loading trucks with soil at 10:00. I will be at the site to screen soil with an XRF and collect confirmation samples.

Thanks,

Josh

From: Lee, Joshua
Sent: Wednesday, March 20, 2024 1:44 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Ooops…I meant next Friday, March **29**.

Josh

From: Lee, Joshua
Sent: Wednesday, March 20, 2024 1:43 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

Ok, thank you for the response. We are tentatively scheduled for continuing excavation at the Ione, WA site next Friday, March 22. This second phase of excavation is dependent on weather and contractor availability; I will let you know if the schedule changes.

Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Wednesday, March 20, 2024 1:40 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Josh,

We tested the other six background samples and the zinc concentrations do not exceed Ecology's requested cleanup level of 120 mg/kg. Please see attached draft analytical tables and draft background sample locations figure. We have one sample (BG-2-022924) located about 100 feet north of the excavation that exceeds the 120 mg/kg cleanup level. Will this modify the requested cleanup level? No. 120 mg/kg is adequate for the cleanup level.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Tuesday, March 19, 2024 11:02 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

We tested the other six background samples and the zinc concentrations do not exceed Ecology's requested cleanup level of 120 mg/kg. Please see attached draft analytical tables and draft background sample locations figure. We have one sample (BG-2-022924) located about 100 feet north of the excavation that exceeds the 120 mg/kg cleanup level. Will this modify the requested cleanup level?

I am working to schedule the contractor for our next excavation at the site; hopefully, this follow-up excavation will be scheduled for next week or the following week. I will contact Ecology with the scheduled excavation date. We plan to screen soil using an XRF during this follow-up excavation.

Thanks,
Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Tuesday, March 5, 2024 2:03 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Should we test the other six samples for TAL metals for a larger sample set? YES

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Tuesday, March 5, 2024 1:23 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

On February 29, 2024, Arcadis mobilized to the Ione spill site and collected 10 soil samples (five to the north and five to the south of the excavation at 50-foot spacing) along the railroad ROW for metals background analysis. The samples were submitted to Eurofins TestAmerica and four (4) samples (two to the north and two to the south of the excavation) were tested for analysis of Toxic Analyte List (TAL) metals (lab report attached). The other six samples are held at the lab. One background sample (Ione-BG-2-022924 collected approx. 100 feet north of the remedial excavation) exceeds Ecology's

requested cleanup level of for zinc (120 mg/kg) with a concentration of 130 mg/kg. The four samples ranged from 96 to 130 mg/kg zinc. The other metals concentrations (arsenic, cadmium, chromium, lead, etc.) samples appear ok compared to MTCA Method A cleanup levels. We have some background levels that are at or near the proposed cleanup level for zinc, and one of the samples exceeds the requested cleanup level of 120 mg/kg for zinc. Should we test the other six samples for TAL metals for a larger sample set?

Thanks,

Josh

From: Lee, Joshua
Sent: Wednesday, February 28, 2024 12:41 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Sara,

We are planning to head out to the Ione, WA site tomorrow to collect ten soil samples from north and south of the remedial excavation (50-foot spacing between samples). We will start with submitting four of these samples for TAL metals analysis to check the background metals concentrations; the other six samples will be held at the lab.

The site location is 48.4852933, -117.2703799 and I have attached a draft figure of the excavation with initial confirmation sample locations. Our confirmation sample results were tested for Metals-Zn and ranged from 260 to 530,000 mg/kg zinc. We plan to use TAL metals analysis for confirmation sampling when we continue the remedial excavation. I will let you know when we have the remedial excavation scheduled.

Thanks,

Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Tuesday, February 27, 2024 9:42 AM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>; Acklam, Nicholas (ECY) <nack461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Hi Josh,

Take at least four samples along the railroad line away from the spill and use the results from this analysis to calculate a background (I would prefer 10 samples). Collect 10 samples along the railroad line away from the spill.

Refer to WAC 173-340-709.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205

Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Monday, February 26, 2024 5:08 PM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

External Email

Hi Sara,

Thanks, I received the email. We are planning the next phase of the remedial excavation in Ione, WA. I have been discussing with our risk assessors and looking into background concentrations via the Natural Background Soil Metals Concentrations in Washington State 1994 document, but that document indicates zinc concentrations between 10-100 mg/kg for most of the state. We are concerned that the railroad ROW in this area has historically hauled zinc and lead concentrate so we might have higher background concentrations. What would Ecology require for us to investigate the background concentrations?

Josh

From: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Sent: Monday, February 26, 2024 4:57 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Subject: FW: Zinc Con Release

> You don't often get email from sful461@ecy.wa.gov. Learn why this is important

See email below.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Fulton, Sara (ECY)
Sent: Friday, February 23, 2024 12:06 PM
To: Lee, Joshua <Joshua.Lee@arcadis.com>
Cc: Loftenius, Christer (ECY) <clof461@ECY.WA.GOV>
Subject: RE: Zinc Con Release

Josh,

After reviewing the information provided by Ecology Spills, I would say to use the Soil Protective of Groundwater to Surface Water Vadose @13 degrees C Freshwater of 120 mg/kg. Also, should test for EPA's target analyte list of 23 metals (TAL) using the same Soil Protective of Groundwater to Surface Water Vadose.

Target Analyte List (TAL)
Metals and Cyanide

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

If you have any additional information that might prove contrary to the use of these CULs, let me know and send it my way for review.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Wednesday, February 21, 2024 8:00 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: Fwd: Zinc Con SDS

Hi Sara,

See attached zinc concentrate SDS for the Ione, WA cleanup.

Thanks,

Josh

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Archived: Tuesday, May 14, 2024 2:29:15 PM
From: Fulton, Sara (ECY)
Sent: Fri, 23 Feb 2024 20:06:29 +0000ARC
To: Lee, Joshua
Cc: Loftenius, Christer (ECY)
Subject: RE: Zinc Con Release
Sensitivity: Normal

Josh,

After reviewing the information provided by Ecology Spills, I would say to use the Soil Protective of Groundwater to Surface Water Vadose @13 degrees C Freshwater of 120 mg/kg. Also, should test for EPA's target analyte list of 23 metals (TAL) using the same Soil Protective of Groundwater to Surface Water Vadose.

Target Analyte List (TAL)
Metals and Cyanide

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
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Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

If you have any additional information that might prove contrary to the use of these CULs, let me know and send it my way for review.

Sara Fulton
Initial Investigator
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Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>

Sent: Wednesday, February 21, 2024 8:00 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: Fwd: Zinc Con SDS

External Email

Hi Sara,

See attached zinc concentrate SDS for the Ione, WA cleanup.

Thanks,

Josh

Archived: Tuesday, May 14, 2024 2:29:17 PM
From: Fulton, Sara (ECY)
Sent: Wed, 21 Feb 2024 17:03:49 +0000ARC
To: Lee, Joshua
Subject: RE: Zinc Con SDS
Sensitivity: Normal

> You don't often get email from sful461@ecy.wa.gov. Learn why this is important

Hi Josh,

Thanks for the MSDS. I will try and get you my response either today or tomorrow.

Sara Fulton
Initial Investigator
Toxic Cleanup Program
Washington Department of Ecology
4601 N. Monroe Street
Spokane, Washington 99205
Cell #: 509-319-0047
sara.fulton@ecy.wa.gov

From: Lee, Joshua <Joshua.Lee@arcadis.com>
Sent: Wednesday, February 21, 2024 8:00 AM
To: Fulton, Sara (ECY) <SFUL461@ECY.WA.GOV>
Subject: Fwd: Zinc Con SDS

External Email

Hi Sara,

See attached zinc concentrate SDS for the Ione, WA cleanup.

Thanks,

Josh

Appendix C

Photograph Log

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 1

Description:
Looking north at the wrecked haul truck pup trailer.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/16/2024

Photograph: 2

Description:
Looking east at the wrecked haul truck pup trailer in the ditch.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/16/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 3

Description:
Crane removing the wrecked haul truck pup trailer.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/16/2024

Photograph: 4

Description:
Excavators scrapping soil and zinc concentrate material.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/16/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 5

Description:
Looking south at excavation area.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/16/2024

Photograph: 6

Description:
Looking south at excavation area on pre-fill.

Location:
State Route 20
MM 407

Photograph taken by:
Garrett Wilson

Date: 2/17/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 7

Description:
Looking south at excavation area after cleanup

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 2/17/2024

Photograph: 8

Description:
Looking north at excavation area after cleanup

Location:
State Route 20
MM 407

Photograph taken by:
Garrett Wilson

Date: 2/17/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 9

Description:
Looking south at additional excavation.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 4/1/2024

Photograph: 10

Description:
Excavated soil being loaded into haul trucks.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 4/1/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 11

Description:
Looking north after cleanup.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 4/1/2024

Photograph Log

Hecla Limited
Incident Response February 16, 2024
Independent Remedial Action Report

Photograph: 12

Description:
Looking south after cleanup.

Location:
State Route 20
MM 407

Photograph taken by:
Joshua Lee

Date: 4/1/2024

Appendix D

Laboratory Analytical Reports and Chain-of-Custody Documentation

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Josh Lee
ARCADIS U.S., Inc
695 N. Legacy Ridge Drive
Suite 200
Liberty Lake, Washington 99019

Generated 2/20/2024 5:45:06 PM

JOB DESCRIPTION

HECLA

JOB NUMBER

590-23297-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

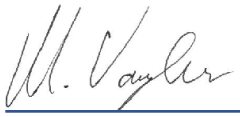
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



Generated
2/20/2024 5:45:06 PM

Authorized for release by
Madison Vaughan, Analyst I
Madison.Vaughan@et.eurofinsus.com
Designee for
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

Table of Contents

Job Narrative
590-23297-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 2/19/2024 10:18 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.3°C.

Metals
Method 6010D: The method blank for preparation batch 590-45895 and 590-45895 and analytical batch 590-45910 contained Zinc above the reporting limit (RL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

Method 6010D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 590-45895 and analytical batch 590-45910 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6010D: The sample duplicate (DUP) precision for preparation batch 590-45895 and analytical batch 590-45910 was outside control limits. Sample matrix interference is suspected.

Method 6010D: The post digestion spike % recovery for Zinc associated with batch 590-45910 was outside of control limits. The associated sample is: (590-23297-A-1-A PDS ^1000).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-23297-1	IONE-1-021624	Solid	02/16/24 17:09	02/19/24 10:18
590-23297-2	IONE-2-021624	Solid	02/16/24 17:20	02/19/24 10:18
590-23297-3	IONE-3-021624	Solid	02/16/24 17:35	02/19/24 10:18
590-23297-4	IONE-4-021624	Solid	02/16/24 17:49	02/19/24 10:18
590-23297-5	IONE-5-021624	Solid	02/16/24 18:00	02/19/24 10:18
590-23297-6	IONE-6-021724	Solid	02/17/24 09:50	02/19/24 10:18
590-23297-7	IONE-7-021724	Solid	02/17/24 10:06	02/19/24 10:18
590-23297-8	IONE-8-021724	Solid	02/17/24 10:35	02/19/24 10:18
590-23297-9	IONE-9-021724	Solid	02/17/24 10:18	02/19/24 10:18
590-23297-10	IONE-10-021724	Solid	02/17/24 10:25	02/19/24 10:18
590-23297-11	IONE-11-021724	Solid	02/17/24 11:05	02/19/24 10:18

Definitions/Glossary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-1-021624
Lab Sample ID: 590-23297-1
Date Collected: 02/16/24 17:09
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 78.1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	530000	B	25000	3900	mg/Kg	☼	02/19/24 14:57	02/20/24 12:28	5000

Client Sample ID: IONE-2-021624
Lab Sample ID: 590-23297-2
Date Collected: 02/16/24 17:20
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 82.6

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	260	B	41	6.5	mg/Kg	☼	02/19/24 14:57	02/20/24 11:24	10

Client Sample ID: IONE-3-021624
Lab Sample ID: 590-23297-3
Date Collected: 02/16/24 17:35
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 75.2

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	17000	B	490	77	mg/Kg	☼	02/19/24 14:57	02/20/24 13:01	100

Client Sample ID: IONE-4-021624
Lab Sample ID: 590-23297-4
Date Collected: 02/16/24 17:49
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 77.5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	110000	B	2500	390	mg/Kg	☼	02/19/24 14:57	02/20/24 13:06	500

Client Sample ID: IONE-5-021624
Lab Sample ID: 590-23297-5
Date Collected: 02/16/24 18:00
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 84.4

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	960	B	43	6.8	mg/Kg	☼	02/19/24 14:57	02/20/24 11:55	10

Client Sample ID: IONE-6-021724
Lab Sample ID: 590-23297-6
Date Collected: 02/17/24 09:50
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 79.4

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	17000	B	390	62	mg/Kg	☼	02/19/24 14:57	02/20/24 13:10	100

Client Sample ID: IONE-7-021724
Lab Sample ID: 590-23297-7
Date Collected: 02/17/24 10:06
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 77.1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	1100	B	48	7.6	mg/Kg	☼	02/19/24 14:57	02/20/24 12:03	10

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-8-021724

Lab Sample ID: 590-23297-8
Date Collected: 02/17/24 10:35
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 84.8

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	230000	B	4400	700	mg/Kg	☼	02/19/24 14:57	02/20/24 13:14	1000

Client Sample ID: IONE-9-021724

Lab Sample ID: 590-23297-9
Date Collected: 02/17/24 10:18
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 88.0

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	80000	B	2000	320	mg/Kg	☼	02/19/24 14:57	02/20/24 16:19	500

Client Sample ID: IONE-10-021724

Lab Sample ID: 590-23297-10
Date Collected: 02/17/24 10:25
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 91.5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	19000	B	360	58	mg/Kg	☼	02/19/24 14:57	02/20/24 13:18	100

Client Sample ID: IONE-11-021724

Lab Sample ID: 590-23297-11
Date Collected: 02/17/24 11:05
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 79.9

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	570	B	40	6.3	mg/Kg	☼	02/19/24 14:57	02/20/24 12:20	10

QC Sample Results

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-45895/2-A
Matrix: Solid
Analysis Batch: 45910

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45895

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	16.4		5.0	0.79	mg/Kg		02/19/24 14:57	02/20/24 10:54	1

Lab Sample ID: LCS 590-45895/1-A
Matrix: Solid
Analysis Batch: 45910

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45895

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Zinc			50.0	56.9		mg/Kg		114	80 - 120		

Lab Sample ID: 590-23297-A-1-C MS ^1000
Matrix: Solid
Analysis Batch: 45910

Client Sample ID: 590-23297-A-1-C MS ^1000
Prep Type: Total/NA
Prep Batch: 45895

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Zinc	160000	E B *+	61.0	535000	4	mg/Kg	☼	61871 1	75 - 125		

Lab Sample ID: 590-23297-A-1-D MSD ^1000
Matrix: Solid
Analysis Batch: 45910

Client Sample ID: 590-23297-A-1-D MSD ^1000
Prep Type: Total/NA
Prep Batch: 45895

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Zinc	160000	E B *+	61.6	528000	4	mg/Kg	☼	60219 3	75 - 125	1	20

Lab Sample ID: 590-23297-A-1-B DU ^1000
Matrix: Solid
Analysis Batch: 45910

Client Sample ID: 590-23297-A-1-B DU ^1000
Prep Type: Total/NA
Prep Batch: 45895

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Zinc	160000	E B *+		526000	F3	mg/Kg	☼			108	20

Lab Chronicle

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-1-021624
Lab Sample ID: 590-23297-1
Date Collected: 02/16/24 17:09
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-1-021624
Lab Sample ID: 590-23297-1
Date Collected: 02/16/24 17:09
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 78.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.30 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		5000	10 mL	10 mL	45910	02/20/24 12:28	AMB	EET SPK

Client Sample ID: IONE-2-021624
Lab Sample ID: 590-23297-2
Date Collected: 02/16/24 17:20
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-2-021624
Lab Sample ID: 590-23297-2
Date Collected: 02/16/24 17:20
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 82.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.47 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		10			45910	02/20/24 11:24	AMB	EET SPK

Client Sample ID: IONE-3-021624
Lab Sample ID: 590-23297-3
Date Collected: 02/16/24 17:35
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-3-021624
Lab Sample ID: 590-23297-3
Date Collected: 02/16/24 17:35
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.37 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		100			45910	02/20/24 13:01	AMB	EET SPK

Client Sample ID: IONE-4-021624
Lab Sample ID: 590-23297-4
Date Collected: 02/16/24 17:49
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Lab Chronicle

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-4-021624
Lab Sample ID: 590-23297-4
Date Collected: 02/16/24 17:49
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 77.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.30 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		500			45910	02/20/24 13:06	AMB	EET SPK

Client Sample ID: IONE-5-021624
Lab Sample ID: 590-23297-5
Date Collected: 02/16/24 18:00
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-5-021624
Lab Sample ID: 590-23297-5
Date Collected: 02/16/24 18:00
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 84.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.38 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		10			45910	02/20/24 11:55	AMB	EET SPK

Client Sample ID: IONE-6-021724
Lab Sample ID: 590-23297-6
Date Collected: 02/17/24 09:50
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-6-021724
Lab Sample ID: 590-23297-6
Date Collected: 02/17/24 09:50
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 79.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.61 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		100			45910	02/20/24 13:10	AMB	EET SPK

Client Sample ID: IONE-7-021724
Lab Sample ID: 590-23297-7
Date Collected: 02/17/24 10:06
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Lab Chronicle

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-7-021724
Lab Sample ID: 590-23297-7
Date Collected: 02/17/24 10:06
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 77.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.35 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		10			45910	02/20/24 12:03	AMB	EET SPK

Client Sample ID: IONE-8-021724
Lab Sample ID: 590-23297-8
Date Collected: 02/17/24 10:35
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-8-021724
Lab Sample ID: 590-23297-8
Date Collected: 02/17/24 10:35
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 84.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.34 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		1000			45910	02/20/24 13:14	AMB	EET SPK

Client Sample ID: IONE-9-021724
Lab Sample ID: 590-23297-9
Date Collected: 02/17/24 10:18
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-9-021724
Lab Sample ID: 590-23297-9
Date Collected: 02/17/24 10:18
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.40 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		500			45915	02/20/24 16:19	AMB	EET SPK

Client Sample ID: IONE-10-021724
Lab Sample ID: 590-23297-10
Date Collected: 02/17/24 10:25
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Lab Chronicle

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Client Sample ID: IONE-10-021724
Lab Sample ID: 590-23297-10
Date Collected: 02/17/24 10:25
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 91.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.50 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		100			45910	02/20/24 13:18	AMB	EET SPK

Client Sample ID: IONE-11-021724
Lab Sample ID: 590-23297-11
Date Collected: 02/17/24 11:05
Matrix: Solid
Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: IONE-11-021724
Lab Sample ID: 590-23297-11
Date Collected: 02/17/24 11:05
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 79.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.58 g	50 mL	45895	02/19/24 14:57	AMB	EET SPK
Total/NA	Analysis	6010D		10			45910	02/20/24 12:20	AMB	EET SPK

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23297-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
3050B	Preparation, Metals	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

>> Select a Laboratory or Service Center <<
#N/A
#N/A
#N/A
##

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact	Project Manager: Joshua Lee	Site Contact:	Date	COC No 1
Arcadis U.S. INC	Email: joshua.lee@arcadis.com	Lab Contact	Carrier:	1 of 1 COCs
1420 5th Avenue, Suite 2400	Tel/Fax: 406-239-7810			TALS Project #
Seattle, WA 98101	Analysis Turnaround Time			Sampler: Garrett Wilson
406-239-7810	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below 24-hour rush			Walk-in Client:
Project Name Hecla-Ione	☐ 2 weeks			Lab Sampling:
Site: Ione	☐ 1 week			
P O #	☐ 2 days			Job / SDG No.
	☑ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Metals (Zn) (Y/N)	Sample Specific Notes.
IONE 1-021624	2/16/2024	1709	G	S		N		Y	Hold additional sample containers for VOCs
IONE2-021624	2/16/24	1720	G	S		N		Y	Hold additional sample containers for VOCs
IONE-3-021624	2/16/24	1735	G	S		N		Y	Hold additional sample containers for VOCs
IONE-4-021624	2/16/24	1749	G	S		N		Y	Hold additional sample containers for VOCs
IONE-5-021624	2/16/24	1800	G	S		N		Y	Hold additional sample containers for VOCs
IONE-6-021724	2/17/24	0950	G	S		N		Y	Hold additional sample containers for VOCs
IONE 7-021724	2/17/24	1006	G	S		N		Y	Hold additional sample containers for VOCs
IONE-8-021724	2/17/24	1035	G	S		N		Y	Hold additional sample containers for VOCs
IONE-9-021724	2/17/24	1018	G	S		N		Y	Hold additional sample containers for VOCs
IONE 10-021724	2/17/24	1025	G	S		N		Y	Hold additional sample containers for VOCs
IONE 11-021724	2/17/24	1105	G	S		N		Y	Hold additional sample containers for VOCs

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be onth)
☐ Return to Client ☐ Di

590-23297 Chain of Custody

Special Instructions/QC Requirements & Comments:

Custody Seals Intact. ☐ Yes ☐ No	Custody Seal No.	Cooler Temp. (°C) Obs'd: 4.2 Corr'd. 4.3	Therm ID No.: IR0016
Relinquished by: Garrett Wilson	Company: Arcadis	Date/Time: 2/19/24 1018	Received by:	Company: TALS SRC	Date/Time 2/19/24 10:18
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc

Job Number: 590-23297-1

Login Number: 23297
List Number: 1
Creator: Morris, Mackenzie 1

List Source: Eurofins Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Josh Lee
Arcadis U.S., Inc.
695 N. Legacy Ridge Drive
Suite 200
Liberty Lake, Washington 99019

Generated 4/9/2024 6:38:01 PM

JOB DESCRIPTION

HECLA-Ione, WA

JOB NUMBER

590-24019-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

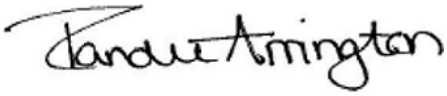
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Randee Arrington, Business Unit Manager
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(509)924-9200

Table of Contents

Job Narrative
590-24019-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/1/2024 4:33 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 18.1°C.

Metals
Method 6010D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 590-46653 and analytical batch 590-46703 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-46703 recovered above the upper control limit for Antimony. The samples associated with this ICV were either 10x the spike amount or non-detects for the affected analytes; therefore, the data have been reported.

Method 6010D: The method blank for preparation batch 590-46653 and 590-46653 and analytical batch 590-46703 contained Sodium above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-46674 recovered above the upper control limit for Thallium. The samples associated with this ICV were non-detects for the affected analytes; therefore, the data have been reported.

Method 6010D: The initial calibration verification (ICV) associated with batch 590-46674 recovered above the upper control limit for Thallium. The samples associated with this ICV were non-detects for the affected analytes; therefore, the data have been reported.

Method 7471B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 590-46652 and analytical batch 590-46680 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-24019-1	Ione-1A-040124	Solid	04/01/24 08:40	04/01/24 16:33
590-24019-2	Ione-2A-040124	Solid	04/01/24 08:50	04/01/24 16:33
590-24019-3	Ione-3A-040124	Solid	04/01/24 09:00	04/01/24 16:33
590-24019-4	Ione-4A-040124	Solid	04/01/24 09:10	04/01/24 16:33
590-24019-5	Ione-5A-040124	Solid	04/01/24 09:20	04/01/24 16:33
590-24019-6	Ione-6A-040124	Solid	04/01/24 11:00	04/01/24 16:33
590-24019-7	Ione-7A-040124	Solid	04/01/24 11:10	04/01/24 16:33
590-24019-8	Ione-8A-040124	Solid	04/01/24 11:20	04/01/24 16:33
590-24019-9	Ione-9A-040124	Solid	04/01/24 13:30	04/01/24 16:33
590-24019-10	Ione-10A-040124	Solid	04/01/24 14:00	04/01/24 16:33
590-24019-11	Ione-11A-040124	Solid	04/01/24 14:10	04/01/24 16:33

Definitions/Glossary

Client: Arcadis U.S., Inc.
Job ID: 590-24019-1
Project/Site: HECLA-Ione, WA

Qualifiers

Metals

Qualifier	Qualifier Description
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
F3	Duplicate RPD exceeds the control limit
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample ID: Ione-1A-040124

Lab Sample ID: 590-24019-1

Date Collected: 04/01/24 08:40
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.9

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**13000**		210	66	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Antimony	ND	F1 F2 ^1+	11	5.2	mg/Kg	☼	04/08/24 10:06	04/09/24 16:20	5
Arsenic	**2.7**	**J**	5.4	2.1	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Barium	**170**		5.4	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Beryllium	ND		5.4	0.87	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Cadmium	ND		4.3	0.25	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Calcium	**2900**	**F1 F2**	430	130	mg/Kg	☼	04/08/24 10:06	04/09/24 16:20	5
Chromium	**13**		5.4	0.76	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Cobalt	**7.6**		5.4	0.42	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Copper	**7.2**	**J**	17	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Iron	**19000**		430	190	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Lead	**13**		13	6.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Magnesium	**4600**	**F1**	210	38	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Manganese	**520**	**F2**	64	4.5	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Nickel	**14**		5.4	0.66	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Potassium	**1800**	**F1 F2**	110	54	mg/Kg	☼	04/08/24 10:06	04/09/24 16:20	5
Selenium	ND		21	13	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Silver	ND		5.4	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Sodium	**220**	**F1 F2 B**	110	45	mg/Kg	☼	04/08/24 10:06	04/09/24 16:20	5
Thallium	ND	^1+	11	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Vanadium	**21**		5.4	0.94	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5
Zinc	**76**		21	3.4	mg/Kg	☼	04/08/24 10:06	04/08/24 14:18	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**15**	**J F2**	46	11	ug/Kg	☼	04/08/24 10:03	04/08/24 17:21	1

Client Sample ID: Ione-2A-040124

Lab Sample ID: 590-24019-2

Date Collected: 04/01/24 08:50
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 83.2

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**13000**		210	66	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Antimony	ND	^1+	11	5.2	mg/Kg	☼	04/08/24 10:06	04/09/24 16:44	5
Arsenic	**2.2**	**J**	5.4	2.1	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Barium	**220**		5.4	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Beryllium	ND		5.4	0.87	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Cadmium	ND		4.3	0.25	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Calcium	**2000**		430	130	mg/Kg	☼	04/08/24 10:06	04/09/24 16:44	5
Chromium	**13**		5.4	0.76	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Cobalt	**6.4**		5.4	0.42	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Copper	**6.2**	**J**	17	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Iron	**17000**		430	190	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Lead	**12**	**J**	13	6.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Magnesium	**4100**		210	38	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Manganese	**520**		64	4.5	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Nickel	**13**		5.4	0.66	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Potassium	**1900**		110	54	mg/Kg	☼	04/08/24 10:06	04/09/24 16:44	5
Selenium	ND		21	13	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5

Client Sample ID: Ione-2A-040124

Lab Sample ID: 590-24019-2

Date Collected: 04/01/24 08:50
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 83.2

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		5.4	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Sodium	**180**	**B**	110	45	mg/Kg	☼	04/08/24 10:06	04/09/24 16:44	5
Thallium	ND	^1+	11	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Vanadium	**18**		5.4	0.94	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5
Zinc	**120**		21	3.4	mg/Kg	☼	04/08/24 10:06	04/08/24 14:42	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**14**	**J**	47	12	ug/Kg	☼	04/08/24 10:03	04/08/24 17:31	1

Client Sample ID: Ione-3A-040124

Lab Sample ID: 590-24019-3

Date Collected: 04/01/24 09:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.3

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**17000**		190	59	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Antimony	ND	^1+	9.7	4.7	mg/Kg	☼	04/08/24 10:06	04/09/24 16:48	5
Arsenic	**4.3**	**J**	4.8	1.9	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Barium	**120**		4.8	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Beryllium	ND		4.8	0.78	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Cadmium	ND		3.9	0.23	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Calcium	**2400**		390	120	mg/Kg	☼	04/08/24 10:06	04/09/24 16:48	5
Chromium	**21**		4.8	0.68	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Cobalt	**11**		4.8	0.37	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Copper	**14**	**J**	15	2.9	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Iron	**26000**		390	170	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Lead	**16**		12	5.7	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Magnesium	**6000**		190	34	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Manganese	**330**		58	4.0	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Nickel	**20**		4.8	0.59	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Potassium	**3400**		97	48	mg/Kg	☼	04/08/24 10:06	04/09/24 16:48	5
Selenium	ND		19	12	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Silver	ND		4.8	1.1	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Sodium	**160**	**B**	97	40	mg/Kg	☼	04/08/24 10:06	04/09/24 16:48	5
Thallium	ND	^1+	9.7	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Vanadium	**29**		4.8	0.85	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5
Zinc	**70**		19	3.1	mg/Kg	☼	04/08/24 10:06	04/08/24 14:46	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**23**	**J**	45	11	ug/Kg	☼	04/08/24 10:03	04/08/24 17:34	1

Client Sample ID: Ione-4A-040124

Lab Sample ID: 590-24019-4

Date Collected: 04/01/24 09:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 84.6

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**14000**		220	69	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Antimony	ND	^1+	11	5.4	mg/Kg	☼	04/08/24 10:06	04/09/24 17:05	5

Client Sample ID: Ione-4A-040124

Lab Sample ID: 590-24019-4

Date Collected: 04/01/24 09:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 84.6

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.3	J	5.6	2.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Barium	91		5.6	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Beryllium	ND		5.6	0.90	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Cadmium	ND		4.5	0.26	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Calcium	2700		450	130	mg/Kg	☼	04/08/24 10:06	04/09/24 17:05	5
Chromium	17		5.6	0.79	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Cobalt	9.5		5.6	0.43	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Copper	22		18	3.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Iron	23000		450	190	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Lead	18		13	6.6	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Magnesium	5200		220	40	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Manganese	270		67	4.7	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Nickel	21		5.6	0.69	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Potassium	2200		110	56	mg/Kg	☼	04/08/24 10:06	04/09/24 17:05	5
Selenium	ND		22	13	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Silver	ND		5.6	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Sodium	140	B	110	47	mg/Kg	☼	04/08/24 10:06	04/09/24 17:05	5
Thallium	ND	^1+	11	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Vanadium	31		5.6	0.98	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5
Zinc	80		22	3.6	mg/Kg	☼	04/08/24 10:06	04/08/24 15:03	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	23	J	40	10	ug/Kg	☼	04/08/24 10:03	04/08/24 17:36	1

Client Sample ID: Ione-5A-040124

Lab Sample ID: 590-24019-5

Date Collected: 04/01/24 09:20
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.4

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	14000		210	64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Antimony	ND	^1+	10	5.1	mg/Kg	☼	04/08/24 10:06	04/09/24 17:09	5
Arsenic	4.2	J	5.2	2.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Barium	92		5.2	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Beryllium	ND		5.2	0.84	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Cadmium	ND		4.2	0.25	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Calcium	2800		420	120	mg/Kg	☼	04/08/24 10:06	04/09/24 17:09	5
Chromium	15		5.2	0.74	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Cobalt	8.2		5.2	0.40	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Copper	19		17	3.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Iron	22000		420	180	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Lead	16		12	6.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Magnesium	4700		210	37	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Manganese	330		62	4.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Nickel	18		5.2	0.64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Potassium	2400		100	52	mg/Kg	☼	04/08/24 10:06	04/09/24 17:09	5
Selenium	ND		21	13	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Silver	ND		5.2	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Sodium	180	B	100	43	mg/Kg	☼	04/08/24 10:06	04/09/24 17:09	5

Client Sample ID: Ione-5A-040124

Lab Sample ID: 590-24019-5

Date Collected: 04/01/24 09:20
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.4

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND	^1+	10	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Vanadium	**27**		5.2	0.92	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5
Zinc	**77**		21	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:07	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**23**	**J**	47	12	ug/Kg	☼	04/08/24 10:03	04/08/24 17:39	1

Client Sample ID: Ione-6A-040124

Lab Sample ID: 590-24019-6

Date Collected: 04/01/24 11:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 93.2

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**7500**		200	61	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Antimony	ND	^1+	9.9	4.8	mg/Kg	☼	04/08/24 10:06	04/09/24 17:13	5
Arsenic	**2.4**	**J**	4.9	2.0	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Barium	**49**		4.9	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Beryllium	ND		4.9	0.80	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Cadmium	ND		3.9	0.23	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Calcium	**2000**		390	120	mg/Kg	☼	04/08/24 10:06	04/09/24 17:13	5
Chromium	**8.0**		4.9	0.70	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Cobalt	**4.2**	**J**	4.9	0.38	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Copper	**6.2**	**J**	16	3.0	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Iron	**14000**		390	170	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Lead	**8.2**	**J**	12	5.8	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Magnesium	**3100**		200	35	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Manganese	**150**		59	4.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Nickel	**8.1**		4.9	0.61	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Potassium	**1200**		99	49	mg/Kg	☼	04/08/24 10:06	04/09/24 17:13	5
Selenium	ND		20	12	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Silver	ND		4.9	1.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Sodium	**110**	**B**	99	41	mg/Kg	☼	04/08/24 10:06	04/09/24 17:13	5
Thallium	ND	^1+	9.9	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Vanadium	**16**		4.9	0.87	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5
Zinc	**34**		20	3.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:11	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		35	8.8	ug/Kg	☼	04/08/24 10:03	04/08/24 17:46	1

Client Sample ID: Ione-7A-040124

Lab Sample ID: 590-24019-7

Date Collected: 04/01/24 11:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 87.4

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**13000**		220	68	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Antimony	ND	^1+	11	5.3	mg/Kg	☼	04/08/24 10:06	04/09/24 17:17	5
Arsenic	ND		5.5	2.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Barium	**93**		5.5	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5

Client Sample ID: Ione-7A-040124

Lab Sample ID: 590-24019-7

Date Collected: 04/01/24 11:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 87.4

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		5.5	0.89	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Cadmium	ND		4.4	0.26	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Calcium	**2100**		440	130	mg/Kg	☼	04/08/24 10:06	04/09/24 17:17	5
Chromium	**10**		5.5	0.78	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Cobalt	**5.7**		5.5	0.43	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Copper	**8.3**	**J**	18	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Iron	**16000**		440	190	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Lead	**9.1**	**J**	13	6.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Magnesium	**3400**		220	39	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Manganese	**180**		66	4.6	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Nickel	**12**		5.5	0.68	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Potassium	**1800**		110	55	mg/Kg	☼	04/08/24 10:06	04/09/24 17:17	5
Selenium	ND		22	13	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Silver	ND		5.5	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Sodium	**180**	**B**	110	46	mg/Kg	☼	04/08/24 10:06	04/09/24 17:17	5
Thallium	ND	^1+	11	1.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Vanadium	**16**		5.5	0.97	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5
Zinc	**52**		22	3.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:15	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**13**	**J**	44	11	ug/Kg	☼	04/08/24 10:03	04/08/24 17:49	1

Client Sample ID: Ione-8A-040124

Lab Sample ID: 590-24019-8

Date Collected: 04/01/24 11:20
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.7

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**14000**		210	63	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Antimony	ND	^1+	10	5.0	mg/Kg	☼	04/08/24 10:06	04/09/24 17:21	5
Arsenic	**2.7**	**J**	5.1	2.0	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Barium	**110**		5.1	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Beryllium	ND		5.1	0.83	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Cadmium	ND		4.1	0.24	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Calcium	**2100**		410	120	mg/Kg	☼	04/08/24 10:06	04/09/24 17:21	5
Chromium	**10**		5.1	0.73	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Cobalt	**6.5**		5.1	0.40	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Copper	**13**	**J**	16	3.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Iron	**17000**		410	180	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Lead	**9.4**	**J**	12	6.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Magnesium	**3500**		210	36	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Manganese	**210**		62	4.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Nickel	**14**		5.1	0.63	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Potassium	**1600**		100	51	mg/Kg	☼	04/08/24 10:06	04/09/24 17:21	5
Selenium	ND		21	12	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Silver	ND		5.1	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Sodium	**160**	**B**	100	43	mg/Kg	☼	04/08/24 10:06	04/09/24 17:21	5
Thallium	ND	^1+	10	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5
Vanadium	**16**		5.1	0.91	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5

Client Sample ID: Ione-8A-040124

Lab Sample ID: 590-24019-8

Date Collected: 04/01/24 11:20
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.7

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	55		21	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:19	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	14	J	40	9.9	ug/Kg	☼	04/08/24 10:03	04/08/24 17:52	1

Client Sample ID: Ione-9A-040124

Lab Sample ID: 590-24019-9

Date Collected: 04/01/24 13:30
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 77.8

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	18000		190	58	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Antimony	ND	^1+	9.3	4.5	mg/Kg	☼	04/08/24 10:06	04/09/24 17:25	5
Arsenic	9.2		4.7	1.9	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Barium	87		4.7	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Beryllium	ND		4.7	0.75	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Cadmium	0.25	J	3.7	0.22	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Calcium	4700		370	110	mg/Kg	☼	04/08/24 10:06	04/09/24 17:25	5
Chromium	24		4.7	0.66	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Cobalt	13		4.7	0.36	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Copper	41		15	2.8	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Iron	36000		370	160	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Lead	29		11	5.5	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Magnesium	7100		190	33	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Manganese	500		56	3.9	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Nickel	34		4.7	0.58	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Potassium	3300		93	47	mg/Kg	☼	04/08/24 10:06	04/09/24 17:25	5
Selenium	ND		19	11	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Silver	ND		4.7	1.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Sodium	240	B	93	39	mg/Kg	☼	04/08/24 10:06	04/09/24 17:25	5
Thallium	ND	^1+	9.3	1.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Vanadium	44		4.7	0.82	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5
Zinc	120		19	3.0	mg/Kg	☼	04/08/24 10:06	04/08/24 15:23	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	42	J	49	12	ug/Kg	☼	04/08/24 10:03	04/08/24 17:54	1

Client Sample ID: Ione-10A-040124

Lab Sample ID: 590-24019-10

Date Collected: 04/01/24 14:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 87.2

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	11000		210	64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Antimony	ND	^1+	10	5.1	mg/Kg	☼	04/08/24 10:06	04/09/24 17:29	5
Arsenic	ND		5.2	2.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Barium	140		5.2	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Beryllium	ND		5.2	0.85	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Cadmium	ND		4.2	0.25	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5

Client Sample ID: Ione-10A-040124

Lab Sample ID: 590-24019-10

Date Collected: 04/01/24 14:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 87.2

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	3200		420	130	mg/Kg	☼	04/08/24 10:06	04/09/24 17:29	5
Chromium	9.6		5.2	0.74	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Cobalt	5.3		5.2	0.41	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Copper	6.0	J	17	3.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Iron	16000		420	180	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Lead	9.3	J	13	6.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Magnesium	3000		210	37	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Manganese	420		63	4.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Nickel	12		5.2	0.64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Potassium	1200		100	52	mg/Kg	☼	04/08/24 10:06	04/09/24 17:29	5
Selenium	ND		21	13	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Silver	ND		5.2	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Sodium	210	B	100	44	mg/Kg	☼	04/08/24 10:06	04/09/24 17:29	5
Thallium	ND	^1+	10	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Vanadium	14		5.2	0.92	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5
Zinc	54		21	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:27	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	13	J	43	11	ug/Kg	☼	04/08/24 10:03	04/08/24 17:57	1

Client Sample ID: Ione-11A-040124

Lab Sample ID: 590-24019-11

Date Collected: 04/01/24 14:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 90.6

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	13000		210	64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Antimony	ND	^1+	10	5.0	mg/Kg	☼	04/08/24 10:06	04/09/24 17:34	5
Arsenic	2.8	J	5.2	2.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Barium	130		5.2	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Beryllium	ND		5.2	0.84	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Cadmium	ND		4.1	0.24	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Calcium	3200		410	120	mg/Kg	☼	04/08/24 10:06	04/09/24 17:34	5
Chromium	12		5.2	0.73	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Cobalt	7.3		5.2	0.40	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Copper	10	J	17	3.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Iron	18000		410	180	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Lead	14		12	6.1	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Magnesium	4100		210	37	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Manganese	470		62	4.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Nickel	14		5.2	0.64	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Potassium	1500		100	52	mg/Kg	☼	04/08/24 10:06	04/09/24 17:34	5
Selenium	ND		21	12	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Silver	ND		5.2	1.2	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Sodium	260	B	100	43	mg/Kg	☼	04/08/24 10:06	04/09/24 17:34	5
Thallium	ND	^1+	10	1.4	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Vanadium	19		5.2	0.91	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5
Zinc	62		21	3.3	mg/Kg	☼	04/08/24 10:06	04/08/24 15:31	5

Client Sample Results

Client: Arcadis U.S., Inc.
Job ID: 590-24019-1
Project/Site: HECLA-Ione, WA

Client Sample ID: Ione-11A-040124
Lab Sample ID: 590-24019-11
Date Collected: 04/01/24 14:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 90.6

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	11	J	42	11	ug/Kg	☼	04/08/24 10:03	04/08/24 17:59	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-46653/2-A
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		50	15	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Arsenic	ND		1.3	0.50	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Barium	ND		1.3	0.34	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Beryllium	ND		1.3	0.20	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Cadmium	ND		1.0	0.059	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Chromium	ND		1.3	0.18	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Cobalt	ND		1.3	0.097	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Copper	ND		4.0	0.76	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Iron	ND		100	43	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Lead	ND		3.0	1.5	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Magnesium	ND		50	8.9	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Manganese	ND		15	1.0	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Nickel	ND		1.3	0.15	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Selenium	ND		5.0	3.0	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Silver	ND		1.3	0.29	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Thallium	ND	^1+	2.5	0.35	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Vanadium	ND		1.3	0.22	mg/Kg		04/08/24 10:05	04/08/24 14:14	1
Zinc	ND		5.0	0.79	mg/Kg		04/08/24 10:05	04/08/24 14:14	1

Lab Sample ID: MB 590-46653/2-A
Matrix: Solid
Analysis Batch: 46703

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	^1+	2.5	1.2	mg/Kg		04/08/24 10:05	04/09/24 16:16	1
Calcium	ND		100	30	mg/Kg		04/08/24 10:05	04/09/24 16:16	1
Potassium	ND		25	13	mg/Kg		04/08/24 10:05	04/09/24 16:16	1
Sodium	17.8	J	25	10	mg/Kg		04/08/24 10:05	04/09/24 16:16	1

Lab Sample ID: LCS 590-46653/1-A
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	500	560		mg/Kg		112	80 - 120
Arsenic	100	94.6		mg/Kg		95	80 - 120
Barium	100	91.2		mg/Kg		91	80 - 120
Beryllium	50.0	52.4		mg/Kg		105	80 - 120
Cadmium	50.0	48.1		mg/Kg		96	80 - 120
Chromium	50.0	47.0		mg/Kg		94	80 - 120
Cobalt	50.0	50.1		mg/Kg		100	80 - 120
Copper	50.0	48.4		mg/Kg		97	80 - 120
Iron	500	590		mg/Kg		118	80 - 120
Lead	50.0	51.0		mg/Kg		102	80 - 120
Magnesium	2500	2860		mg/Kg		115	80 - 120
Manganese	50.0	50.2		mg/Kg		100	80 - 120
Nickel	50.0	50.5		mg/Kg		101	80 - 120
Selenium	100	95.2		mg/Kg		95	80 - 120
Silver	5.00	5.34		mg/Kg		107	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-46653/1-A
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	100	106	^1+	mg/Kg		106	80 - 120
Vanadium	50.0	48.1		mg/Kg		96	80 - 120
Zinc	50.0	54.8		mg/Kg		110	80 - 120

Lab Sample ID: LCS 590-46653/1-A
Matrix: Solid
Analysis Batch: 46703

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	50.0	60.1	^1+	mg/Kg		120	80 - 120
Calcium	2500	3010		mg/Kg		120	80 - 120
Potassium	2500	2950		mg/Kg		118	80 - 120
Sodium	2500	2960		mg/Kg		118	80 - 120

Lab Sample ID: 590-24019-1 MS
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	13000		569	17100	4	mg/Kg	☼	697	75 - 125
Arsenic	2.7	J	114	109		mg/Kg	☼	94	75 - 125
Barium	170		114	277		mg/Kg	☼	94	75 - 125
Beryllium	ND		56.9	59.7		mg/Kg	☼	105	75 - 125
Cadmium	ND		56.9	54.6		mg/Kg	☼	96	75 - 125
Chromium	13		56.9	67.9		mg/Kg	☼	97	75 - 125
Cobalt	7.6		56.9	65.4		mg/Kg	☼	101	75 - 125
Copper	7.2	J	56.9	62.9		mg/Kg	☼	98	75 - 125
Iron	19000		569	21200	4	mg/Kg	☼	349	75 - 125
Lead	13		56.9	71.0		mg/Kg	☼	101	75 - 125
Magnesium	4600	F1	2850	8260	F1	mg/Kg	☼	128	75 - 125
Manganese	520	F2	56.9	564	4	mg/Kg	☼	76	75 - 125
Nickel	14		56.9	73.2		mg/Kg	☼	104	75 - 125
Selenium	ND		114	110		mg/Kg	☼	97	75 - 125
Silver	ND		5.69	6.28	J	mg/Kg	☼	110	75 - 125
Thallium	ND	^1+	114	122	^1+	mg/Kg	☼	107	75 - 125
Vanadium	21		56.9	77.6		mg/Kg	☼	99	75 - 125
Zinc	76		56.9	144		mg/Kg	☼	120	75 - 125

Lab Sample ID: 590-24019-1 MS
Matrix: Solid
Analysis Batch: 46703

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	ND	F1 F2 ^1+	56.9	67.4	^1+	mg/Kg	☼	118	75 - 125
Calcium	2900	F1 F2	2850	8940	F1	mg/Kg	☼	212	75 - 125
Potassium	1800	F1 F2	2850	7560	F1	mg/Kg	☼	201	75 - 125

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 590-24019-1 MSD
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	13000		564	18100	4	mg/Kg	☼	896	75 - 125	6	20
Arsenic	2.7	J	113	99.1		mg/Kg	☼	86	75 - 125	10	20
Barium	170		113	300		mg/Kg	☼	116	75 - 125	8	20
Beryllium	ND		56.4	54.2		mg/Kg	☼	96	75 - 125	10	20
Cadmium	ND		56.4	50.0		mg/Kg	☼	89	75 - 125	9	20
Chromium	13		56.4	65.7		mg/Kg	☼	94	75 - 125	3	20
Cobalt	7.6		56.4	66.1		mg/Kg	☼	104	75 - 125	1	20
Copper	7.2	J	56.4	59.7		mg/Kg	☼	93	75 - 125	5	20
Iron	19000		564	23200	4	mg/Kg	☼	715	75 - 125	9	20
Lead	13		56.4	68.6		mg/Kg	☼	98	75 - 125	3	20
Magnesium	4600	F1	2820	8230	F1	mg/Kg	☼	128	75 - 125	0	20
Manganese	520	F2	56.4	802	4 F2	mg/Kg	☼	498	75 - 125	35	20
Nickel	14		56.4	70.5		mg/Kg	☼	101	75 - 125	4	20
Selenium	ND		113	100		mg/Kg	☼	89	75 - 125	10	20
Silver	ND		5.64	5.70	J	mg/Kg	☼	101	75 - 125	10	20
Thallium	ND	^1+	113	110	^1+	mg/Kg	☼	97	75 - 125	11	20
Vanadium	21		56.4	76.9		mg/Kg	☼	99	75 - 125	1	20
Zinc	76		56.4	141		mg/Kg	☼	116	75 - 125	2	20

Lab Sample ID: 590-24019-1 MSD
Matrix: Solid
Analysis Batch: 46703

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	ND	F1 F2 ^1+	56.4	24.5	F1 F2 ^1+	mg/Kg	☼	44	75 - 125	93	20
Calcium	2900	F1 F2	2820	3280	F1 F2	mg/Kg	☼	13	75 - 125	93	20
Potassium	1800	F1 F2	2820	2960	F1 F2	mg/Kg	☼	39	75 - 125	88	20

Lab Sample ID: 590-24019-1 DU
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	13000		13900		mg/Kg	☼	6	20
Arsenic	2.7	J	3.03	J	mg/Kg	☼	11	20
Barium	170		136	F3	mg/Kg	☼	22	20
Beryllium	ND		ND		mg/Kg	☼	NC	20
Cadmium	ND		ND		mg/Kg	☼	NC	20
Chromium	13		13.7		mg/Kg	☼	8	20
Cobalt	7.6		7.78		mg/Kg	☼	2	20
Copper	7.2	J	7.84	J	mg/Kg	☼	8	20
Iron	19000		20100		mg/Kg	☼	5	20
Lead	13		13.2		mg/Kg	☼	2	20
Magnesium	4600	F1	4840		mg/Kg	☼	5	20
Manganese	520	F2	312	F3	mg/Kg	☼	50	20
Nickel	14		14.9		mg/Kg	☼	8	20
Selenium	ND		ND		mg/Kg	☼	NC	20
Silver	ND		ND		mg/Kg	☼	NC	20
Thallium	ND	^1+	ND	^1+	mg/Kg	☼	NC	20

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 590-24019-1 DU
Matrix: Solid
Analysis Batch: 46674

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Vanadium	21		20.6		mg/Kg	☼	3	20
Zinc	76		77.3		mg/Kg	☼	2	20

Lab Sample ID: 590-24019-1 DU
Matrix: Solid
Analysis Batch: 46703

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46653

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	ND	F1 F2 ^1+	ND	^1+	mg/Kg	☼	NC	20
Calcium	2900	F1 F2	3670	F3	mg/Kg	☼	23	20
Potassium	1800	F1 F2	1950		mg/Kg	☼	6	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-46652/9-A
Matrix: Solid
Analysis Batch: 46680

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46652

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	12	ug/Kg		04/08/24 10:02	04/08/24 17:19	1

Lab Sample ID: LCS 590-46652/8-A
Matrix: Solid
Analysis Batch: 46680

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46652

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hg	200	199		ug/Kg		100	80 - 120

Lab Sample ID: 590-24019-1 MS
Matrix: Solid
Analysis Batch: 46680

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46652

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Hg	15	J F2	217	213		ug/Kg	☼	91	80 - 120

Lab Sample ID: 590-24019-1 MSD
Matrix: Solid
Analysis Batch: 46680

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46652

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hg	15	J F2	226	272	F2	ug/Kg	☼	114	80 - 120	24	20

Lab Sample ID: 590-24019-1 DU
Matrix: Solid
Analysis Batch: 46680

Client Sample ID: Ione-1A-040124
Prep Type: Total/NA
Prep Batch: 46652

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hg	15	J F2	17.7	J	ug/Kg	☼	19	20

Lab Chronicle

Client: Arcadis U.S., Inc.
Job ID: 590-24019-1
Project/Site: HECLA-Ione, WA

Client Sample ID: Ione-1A-040124
Lab Sample ID: 590-24019-1
Date Collected: 04/01/24 08:40
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-1A-040124
Lab Sample ID: 590-24019-1
Date Collected: 04/01/24 08:40
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.34 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 14:18	AMB	EET SPK
Total/NA	Prep	3050B			1.34 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 16:20	AMB	EET SPK
Total/NA	Prep	7471B			0.63 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:21	AMB	EET SPK

Client Sample ID: Ione-2A-040124
Lab Sample ID: 590-24019-2
Date Collected: 04/01/24 08:50
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-2A-040124
Lab Sample ID: 590-24019-2
Date Collected: 04/01/24 08:50
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 83.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.40 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 14:42	AMB	EET SPK
Total/NA	Prep	3050B			1.40 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 16:44	AMB	EET SPK
Total/NA	Prep	7471B			0.64 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:31	AMB	EET SPK

Client Sample ID: Ione-3A-040124
Lab Sample ID: 590-24019-3
Date Collected: 04/01/24 09:00
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Lab Chronicle

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Client Sample ID: Ione-3A-040124

Lab Sample ID: 590-24019-3

Date Collected: 04/01/24 09:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.50 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 14:46	AMB	EET SPK
Total/NA	Prep	3050B			1.50 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 16:48	AMB	EET SPK
Total/NA	Prep	7471B			0.64 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:34	AMB	EET SPK

Client Sample ID: Ione-4A-040124

Lab Sample ID: 590-24019-4

Date Collected: 04/01/24 09:10
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-4A-040124

Lab Sample ID: 590-24019-4

Date Collected: 04/01/24 09:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 84.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.32 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:03	AMB	EET SPK
Total/NA	Prep	3050B			1.32 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:05	AMB	EET SPK
Total/NA	Prep	7471B			0.73 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:36	AMB	EET SPK

Client Sample ID: Ione-5A-040124

Lab Sample ID: 590-24019-5

Date Collected: 04/01/24 09:20
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-5A-040124

Lab Sample ID: 590-24019-5

Date Collected: 04/01/24 09:20
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 86.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.39 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:07	AMB	EET SPK
Total/NA	Prep	3050B			1.39 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:09	AMB	EET SPK
Total/NA	Prep	7471B			0.62 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:39	AMB	EET SPK

Lab Chronicle

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Client Sample ID: Ione-6A-040124
Lab Sample ID: 590-24019-6
Date Collected: 04/01/24 11:00
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-6A-040124
Lab Sample ID: 590-24019-6
Date Collected: 04/01/24 11:00
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 93.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.36 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:11	AMB	EET SPK
Total/NA	Prep	3050B			1.36 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:13	AMB	EET SPK
Total/NA	Prep	7471B			0.76 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:46	AMB	EET SPK

Client Sample ID: Ione-7A-040124
Lab Sample ID: 590-24019-7
Date Collected: 04/01/24 11:10
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-7A-040124
Lab Sample ID: 590-24019-7
Date Collected: 04/01/24 11:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 87.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.30 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:15	AMB	EET SPK
Total/NA	Prep	3050B			1.30 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:17	AMB	EET SPK
Total/NA	Prep	7471B			0.65 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:49	AMB	EET SPK

Client Sample ID: Ione-8A-040124
Lab Sample ID: 590-24019-8
Date Collected: 04/01/24 11:20
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Lab Chronicle

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Client Sample ID: Ione-8A-040124

Lab Sample ID: 590-24019-8

Date Collected: 04/01/24 11:20
Date Received: 04/01/24 16:33

Matrix: Solid
Percent Solids: 86.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.40 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:19	AMB	EET SPK
Total/NA	Prep	3050B			1.40 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:21	AMB	EET SPK
Total/NA	Prep	7471B			0.72 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:52	AMB	EET SPK

Client Sample ID: Ione-9A-040124

Lab Sample ID: 590-24019-9

Date Collected: 04/01/24 13:30
Date Received: 04/01/24 16:33

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-9A-040124

Lab Sample ID: 590-24019-9

Date Collected: 04/01/24 13:30
Date Received: 04/01/24 16:33

Matrix: Solid
Percent Solids: 77.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.72 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:23	AMB	EET SPK
Total/NA	Prep	3050B			1.72 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:25	AMB	EET SPK
Total/NA	Prep	7471B			0.66 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:54	AMB	EET SPK

Client Sample ID: Ione-10A-040124

Lab Sample ID: 590-24019-10

Date Collected: 04/01/24 14:00
Date Received: 04/01/24 16:33

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-10A-040124

Lab Sample ID: 590-24019-10

Date Collected: 04/01/24 14:00
Date Received: 04/01/24 16:33

Matrix: Solid
Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.37 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:27	AMB	EET SPK
Total/NA	Prep	3050B			1.37 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:29	AMB	EET SPK
Total/NA	Prep	7471B			0.66 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:57	AMB	EET SPK

Lab Chronicle

Client: Arcadis U.S., Inc.
Job ID: 590-24019-1
Project/Site: HECLA-Ione, WA

Client Sample ID: Ione-11A-040124
Lab Sample ID: 590-24019-11
Date Collected: 04/01/24 14:10
Matrix: Solid
Date Received: 04/01/24 16:33

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46598	04/03/24 14:53	MRV	EET SPK

Client Sample ID: Ione-11A-040124
Lab Sample ID: 590-24019-11
Date Collected: 04/01/24 14:10
Matrix: Solid
Date Received: 04/01/24 16:33
Percent Solids: 90.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.33 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46674	04/08/24 15:31	AMB	EET SPK
Total/NA	Prep	3050B			1.33 g	50 mL	46653	04/08/24 10:06	AMB	EET SPK
Total/NA	Analysis	6010D		5			46703	04/09/24 17:34	AMB	EET SPK
Total/NA	Prep	7471B			0.65 g	50 mL	46652	04/08/24 10:03	AMB	EET SPK
Total/NA	Analysis	7471B		1			46680	04/08/24 17:59	AMB	EET SPK

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA-Ione, WA

Job ID: 590-24019-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET SPK
7471B	Mercury (CVAA)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
3050B	Preparation, Metals	SW846	EET SPK
7471B	Preparation, Mercury	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Chain of Custody Record

eurofins | Environment Testing America

Eurofins Spokane
11922 E 1st Avenue
Spokane WA 99206-5302
phone 509.924.9200 fax 509.924.9290

Regulatory Program ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact	Project Manager: Josh Lee	Site Contact:	Date	COC No: 1 of 1 COCs
Your Company Name here: Arcadis	Email: Joshua.Lee@arcadis.com	Lab Contact:	Carrier:	TALS Project #:
Address: 8908 E Wellesley Ave	Tel/Fax:			Sampler:
City/State/Zip: Spokane, WA 99202	Analysis Turnaround Time: ☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only: Walk-in Client: / Lab Sampling:
(xxx) xxx-xxxx: 406-239-7118 Phone	TAT if different from Below: ☐ 2 weeks ☒ 1 week ☐ 2 days ☐ 1 day			Job / SDG No.
(xxx) xxx-xxxx: FAX				
Project Name: Hecla - Ione, WA				
Site:				
PO#: 3021 6383				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TAL Metals	Sample Specific Notes.
Ione - 1A - 040124	4/1/24	0870	G	SS	1			X	
Ione - 2A - 040124		0850						X	
Ione - 3A - 040124		0900						X	
Ione - 4A - 040124		0910						X	
Ione - 5A - 040124		0920						X	
Ione - 6A - 040124		1100						X	
Ione - 7A - 040124		1110						X	
Ione - 8A - 040124		1120						X	
Ione - 9A - 040124		1330						X	
Ione - 10A - 040124		1400						X	
Ione - 11A - 040124		1410						X	

590-24019 Chain of Custody

Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other

Possible Hazard Identification
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: 1 week TAT. ***

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.	Cooler Temp. (°C): Obs'd: 18.0 Corr'd: 18.07	Therm ID No.: IR0006
Relinquished by:	Company: Arcadis	Date/Time: 4/1/24/630	Received by: / Company: / Date/Time:
Relinquished by:	Company:	Date/Time:	Received by: / Company: / Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: / Company: EE&S / Date/Time: 4/1/24 16'33

Login Sample Receipt Checklist

Client: Arcadis U.S., Inc.

Job Number: 590-24019-1

Login Number: 24019

List Source: Eurofins Spokane

List Number: 1

Creator: Morris, Mackenzie 1

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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1 2 3 4 5 6 7 8 9 10 11 12

ANALYTICAL REPORT

PREPARED FOR

Attn: Josh Lee
Arcadis U.S., Inc.
695 N. Legacy Ridge Drive
Suite 200
Liberty Lake, Washington 99019

Generated 3/11/2024 5:32:55 PM

JOB DESCRIPTION

HECLA

JOB NUMBER

590-23482-2

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

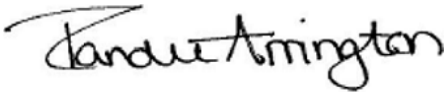
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

Table of Contents

Job ID: 590-23482-2 — Eurofins Spokane

Job Narrative
590-23482-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 2/29/2024 4:13 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.0°C.

Receipt Exceptions
The following samples were activated by the client on 3/5/24: IONE-BG-3-022924 (590-23482-3), IONE-BG-4-022924 (590-23482-4), IONE-BG-5-022924 (590-23482-5), IONE-BG-8-022924 (590-23482-8), IONE-BG-9-022924 (590-23482-9) and IONE-BG-10-022924 (590-23482-10).

Metals
Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-46192 recovered above the upper control limit for Antimony, Manganese and Thallium. The samples associated with this ICV were either 10x the spike amount, have hits below the RL, or non-detects for the affected analytes; therefore, the data have been reported.

Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-46200 recovered above the upper control limit for Manganese. The samples associated with this ICV were non-detects for the affected analytes; therefore, the data have been reported.

Method 7471B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 590-46160 and analytical batch 590-46173 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-23482-3	IONE-BG-3-022924	Solid	02/29/24 09:07	02/29/24 16:13
590-23482-4	IONE-BG-4-022924	Solid	02/29/24 09:14	02/29/24 16:13
590-23482-5	IONE-BG-5-022924	Solid	02/29/24 09:22	02/29/24 16:13
590-23482-8	IONE-BG-8-022924	Solid	02/29/24 09:48	02/29/24 16:13
590-23482-9	IONE-BG-9-022924	Solid	02/29/24 09:50	02/29/24 16:13
590-23482-10	IONE-BG-10-022924	Solid	02/29/24 10:04	02/29/24 16:13

Definitions/Glossary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Qualifiers

Metals

Qualifier	Qualifier Description
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL, and the absolute difference between results is < the upper reporting limits for both.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample ID: IONE-BG-3-022924

Lab Sample ID: 590-23482-3

Date Collected: 02/29/24 09:07
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 88.3

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	9800		200	61	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Antimony	ND	^1+	9.9	4.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Arsenic	5.1		5.0	2.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Barium	47		5.0	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Beryllium	ND		5.0	0.80	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Cadmium	ND		4.0	0.23	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Calcium	19000	F2	400	120	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Chromium	16		5.0	0.70	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Cobalt	6.9		5.0	0.38	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Copper	15	J	16	3.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Iron	18000		400	170	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Lead	16		12	5.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Magnesium	9500	F1	200	35	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Manganese	310	^1+	59	4.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Nickel	16		5.0	0.61	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Potassium	1300		99	50	mg/Kg	☼	03/07/24 11:07	03/08/24 15:46	5
Selenium	ND		20	12	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Silver	ND		5.0	1.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Sodium	150		99	41	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Thallium	ND	^1+	9.9	1.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Vanadium	22		5.0	0.87	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5
Zinc	68		20	3.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:04	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	17	J F1	49	12	ug/Kg	☼	03/07/24 11:05	03/07/24 16:39	1

Client Sample ID: IONE-BG-4-022924

Lab Sample ID: 590-23482-4

Date Collected: 02/29/24 09:14
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 83.7

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	12000		240	72	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Antimony	ND	^1+	12	5.7	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Arsenic	5.6	J	5.9	2.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Barium	71		5.9	1.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Beryllium	ND		5.9	0.95	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Cadmium	ND		4.7	0.28	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Calcium	27000		470	140	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Chromium	18		5.9	0.83	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Cobalt	9.4		5.9	0.46	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Copper	19		19	3.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Iron	22000		470	200	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Lead	21		14	6.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Magnesium	14000		240	42	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Manganese	470	^1+	71	4.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Nickel	20		5.9	0.72	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Potassium	1900		120	59	mg/Kg	☼	03/07/24 11:07	03/08/24 16:10	5
Selenium	ND		24	14	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5

Client Sample ID: IONE-BG-4-022924

Lab Sample ID: 590-23482-4
Date Collected: 02/29/24 09:14
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 83.7

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		5.9	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Sodium	**130**		120	49	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Thallium	ND	^1+	12	1.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Vanadium	**29**		5.9	1.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5
Zinc	**84**		24	3.7	mg/Kg	☼	03/07/24 11:07	03/08/24 11:29	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**19**	**J**	42	10	ug/Kg	☼	03/07/24 11:05	03/07/24 16:49	1

Client Sample ID: IONE-BG-5-022924

Lab Sample ID: 590-23482-5
Date Collected: 02/29/24 09:22
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 86.0

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**9200**		200	60	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Antimony	ND	^1+	9.8	4.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Arsenic	**7.0**		4.9	1.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Barium	**51**		4.9	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Beryllium	ND		4.9	0.79	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Cadmium	**0.28**	**J**	3.9	0.23	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Calcium	**16000**		390	120	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Chromium	**13**		4.9	0.69	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Cobalt	**7.3**		4.9	0.38	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Copper	**18**		16	3.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Iron	**19000**		390	170	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Lead	**43**		12	5.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Magnesium	**8100**		200	35	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Manganese	**420**	**^1+**	59	4.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Nickel	**15**		4.9	0.60	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Potassium	**1500**		98	49	mg/Kg	☼	03/07/24 11:07	03/08/24 16:15	5
Selenium	ND		20	12	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Silver	ND		4.9	1.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Sodium	**110**		98	41	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Thallium	ND	^1+	9.8	1.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Vanadium	**19**		4.9	0.86	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5
Zinc	**96**		20	3.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:33	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**14**	**J**	38	9.4	ug/Kg	☼	03/07/24 11:05	03/07/24 16:51	1

Client Sample ID: IONE-BG-8-022924

Lab Sample ID: 590-23482-8
Date Collected: 02/29/24 09:48
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.9

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**13000**		240	74	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Antimony	ND	^1+	12	5.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5

Client Sample ID: IONE-BG-8-022924

Lab Sample ID: 590-23482-8

Date Collected: 02/29/24 09:48
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.9

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.9	J	6.0	2.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Barium	110		6.0	1.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Beryllium	ND		6.0	0.97	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Cadmium	0.31	J	4.8	0.28	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Calcium	30000		480	140	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Chromium	18		6.0	0.85	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Cobalt	10		6.0	0.46	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Copper	20		19	3.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Iron	23000		480	210	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Lead	24		14	7.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Magnesium	8700		240	42	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Manganese	460	^1+	72	5.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Nickel	21		6.0	0.74	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Potassium	2200		120	60	mg/Kg	☼	03/07/24 11:07	03/08/24 16:31	5
Selenium	ND		24	14	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Silver	ND		6.0	1.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Sodium	120		120	50	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Thallium	ND	^1+	12	1.7	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Vanadium	30		6.0	1.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5
Zinc	87		24	3.8	mg/Kg	☼	03/07/24 11:07	03/08/24 11:49	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	29	J	45	11	ug/Kg	☼	03/07/24 11:05	03/07/24 16:54	1

Client Sample ID: IONE-BG-9-022924

Lab Sample ID: 590-23482-9

Date Collected: 02/29/24 09:50
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.6

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	14000		190	58	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Antimony	ND	^1+	9.5	4.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Arsenic	5.0		4.7	1.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Barium	120		4.7	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Beryllium	ND		4.7	0.77	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Cadmium	0.31	J	3.8	0.22	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Calcium	19000		380	110	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Chromium	18		4.7	0.67	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Cobalt	10		4.7	0.37	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Copper	22		15	2.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Iron	23000		380	160	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Lead	19		11	5.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Magnesium	7900		190	34	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Manganese	560	^1+	57	3.9	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Nickel	21		4.7	0.58	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Potassium	2000		95	47	mg/Kg	☼	03/07/24 11:07	03/08/24 16:35	5
Selenium	ND		19	11	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Silver	ND		4.7	1.1	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Sodium	110		95	39	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5

Client Sample ID: IONE-BG-9-022924

Lab Sample ID: 590-23482-9

Date Collected: 02/29/24 09:50
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.6

Method: SW846 6010D - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND	^1+	9.5	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Vanadium	**31**		4.7	0.83	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5
Zinc	**85**		19	3.0	mg/Kg	☼	03/07/24 11:07	03/08/24 11:53	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**32**	**J**	44	11	ug/Kg	☼	03/07/24 11:05	03/07/24 16:57	1

Client Sample ID: IONE-BG-10-022924

Lab Sample ID: 590-23482-10

Date Collected: 02/29/24 10:04
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 75.3

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**13000**		220	68	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Antimony	ND	^1+	11	5.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Arsenic	**4.0**	**J**	5.5	2.2	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Barium	**100**		5.5	1.5	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Beryllium	ND		5.5	0.89	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Cadmium	ND		4.4	0.26	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Calcium	**14000**		440	130	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Chromium	**16**		5.5	0.78	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Cobalt	**9.0**		5.5	0.43	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Copper	**17**	**J**	18	3.4	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Iron	**21000**		440	190	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Lead	**29**		13	6.5	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Magnesium	**7300**		220	39	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Manganese	**450**	**^1+**	66	4.6	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Nickel	**18**		5.5	0.68	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Potassium	**1900**		110	55	mg/Kg	☼	03/07/24 11:07	03/08/24 16:39	5
Selenium	ND		22	13	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Silver	ND		5.5	1.3	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Sodium	**140**		110	46	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Thallium	ND	^1+	11	1.5	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Vanadium	**27**		5.5	0.97	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5
Zinc	**94**		22	3.5	mg/Kg	☼	03/07/24 11:07	03/08/24 11:57	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**33**	**J**	49	12	ug/Kg	☼	03/07/24 11:05	03/07/24 17:04	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-46161/2-A
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46161

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		50	15	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Antimony	ND	^1+	2.5	1.2	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Arsenic	ND		1.3	0.50	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Barium	ND		1.3	0.34	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Beryllium	ND		1.3	0.20	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Cadmium	ND		1.0	0.059	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Calcium	ND		100	30	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Chromium	ND		1.3	0.18	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Cobalt	ND		1.3	0.097	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Copper	ND		4.0	0.76	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Iron	ND		100	43	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Lead	ND		3.0	1.5	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Magnesium	ND		50	8.9	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Manganese	ND	^1+	15	1.0	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Nickel	ND		1.3	0.15	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Selenium	ND		5.0	3.0	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Silver	ND		1.3	0.29	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Sodium	ND		25	10	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Thallium	ND	^1+	2.5	0.35	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Vanadium	ND		1.3	0.22	mg/Kg		03/07/24 11:07	03/08/24 11:00	1
Zinc	ND		5.0	0.79	mg/Kg		03/07/24 11:07	03/08/24 11:00	1

Lab Sample ID: MB 590-46161/2-A
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46161

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND	^1+	15	1.0	mg/Kg		03/07/24 11:07	03/08/24 15:42	1
Potassium	ND		25	13	mg/Kg		03/07/24 11:07	03/08/24 15:42	1

Lab Sample ID: LCS 590-46161/1-A
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	500	480		mg/Kg		96	80 - 120
Antimony	50.0	51.0	^1+	mg/Kg		102	80 - 120
Arsenic	100	92.5		mg/Kg		92	80 - 120
Barium	100	85.9		mg/Kg		86	80 - 120
Beryllium	50.0	49.7		mg/Kg		99	80 - 120
Cadmium	50.0	47.6		mg/Kg		95	80 - 120
Calcium	2500	2430		mg/Kg		97	80 - 120
Chromium	50.0	47.1		mg/Kg		94	80 - 120
Cobalt	50.0	49.6		mg/Kg		99	80 - 120
Copper	50.0	48.1		mg/Kg		96	80 - 120
Iron	500	478		mg/Kg		96	80 - 120
Lead	50.0	49.2		mg/Kg		98	80 - 120
Magnesium	2500	2460		mg/Kg		98	80 - 120
Manganese	50.0	48.8	^1+	mg/Kg		98	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-46161/1-A
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nickel	50.0	49.2		mg/Kg		98	80 - 120
Selenium	100	92.4		mg/Kg		92	80 - 120
Silver	5.00	4.65		mg/Kg		93	80 - 120
Sodium	2500	2430		mg/Kg		97	80 - 120
Thallium	100	103	^1+	mg/Kg		103	80 - 120
Vanadium	50.0	44.8		mg/Kg		90	80 - 120
Zinc	50.0	49.5		mg/Kg		99	80 - 120

Lab Sample ID: LCS 590-46161/1-A
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	50.0	47.8	^1+	mg/Kg		96	80 - 120
Potassium	2500	2330		mg/Kg		93	80 - 120

Lab Sample ID: 590-23482-3 MS
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	9800		561	10500	4	mg/Kg	☼	121	75 - 125
Antimony	ND	^1+	56.1	52.6	^1+	mg/Kg	☼	94	75 - 125
Arsenic	5.1		112	109		mg/Kg	☼	93	75 - 125
Barium	47		112	140		mg/Kg	☼	83	75 - 125
Beryllium	ND		56.1	56.3		mg/Kg	☼	100	75 - 125
Cadmium	ND		56.1	54.1		mg/Kg	☼	97	75 - 125
Calcium	19000	F2	2800	22400	4	mg/Kg	☼	104	75 - 125
Chromium	16		56.1	66.9		mg/Kg	☼	90	75 - 125
Cobalt	6.9		56.1	62.8		mg/Kg	☼	100	75 - 125
Copper	15	J	56.1	68.1		mg/Kg	☼	95	75 - 125
Iron	18000		561	16600	4	mg/Kg	☼	-326	75 - 125
Lead	16		56.1	72.1		mg/Kg	☼	99	75 - 125
Magnesium	9500	F1	2800	10500	F1	mg/Kg	☼	36	75 - 125
Manganese	310	^1+	56.1	351	^1+ 4	mg/Kg	☼	71	75 - 125
Nickel	16		56.1	70.8		mg/Kg	☼	97	75 - 125
Selenium	ND		112	104		mg/Kg	☼	93	75 - 125
Silver	ND		5.61	5.63	J	mg/Kg	☼	100	75 - 125
Sodium	150		2800	2920		mg/Kg	☼	99	75 - 125
Thallium	ND	^1+	112	117	^1+	mg/Kg	☼	104	75 - 125
Vanadium	22		56.1	68.2		mg/Kg	☼	83	75 - 125
Zinc	68		56.1	120		mg/Kg	☼	94	75 - 125

Lab Sample ID: 590-23482-3 MS
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	310	^1+	56.1	347	^1+ 4	mg/Kg	☼	75	75 - 125

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 590-23482-3 MS
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	1300		2800	4030		mg/Kg	☼	96	75 - 125

Lab Sample ID: 590-23482-3 MSD
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	9800		534	8950	4	mg/Kg	☼	-158	75 - 125	16	20
Antimony	ND	^1+	53.4	48.0	^1+	mg/Kg	☼	90	75 - 125	9	20
Arsenic	5.1		107	100		mg/Kg	☼	89	75 - 125	8	20
Barium	47		107	130		mg/Kg	☼	78	75 - 125	7	20
Beryllium	ND		53.4	51.7		mg/Kg	☼	97	75 - 125	8	20
Cadmium	ND		53.4	49.6		mg/Kg	☼	93	75 - 125	9	20
Calcium	19000	F2	2670	17500	4 F2	mg/Kg	☼	-71	75 - 125	24	20
Chromium	16		53.4	61.9		mg/Kg	☼	85	75 - 125	8	20
Cobalt	6.9		53.4	58.4		mg/Kg	☼	96	75 - 125	7	20
Copper	15	J	53.4	64.2		mg/Kg	☼	92	75 - 125	6	20
Iron	18000		534	16400	4	mg/Kg	☼	-389	75 - 125	2	20
Lead	16		53.4	67.3		mg/Kg	☼	95	75 - 125	7	20
Magnesium	9500	F1	2670	9950	F1	mg/Kg	☼	16	75 - 125	6	20
Manganese	310	^1+	53.4	365	^1+ 4	mg/Kg	☼	100	75 - 125	4	20
Nickel	16		53.4	65.8		mg/Kg	☼	93	75 - 125	7	20
Selenium	ND		107	95.5		mg/Kg	☼	89	75 - 125	8	20
Silver	ND		5.34	4.90	J	mg/Kg	☼	92	75 - 125	14	20
Sodium	150		2670	2700		mg/Kg	☼	95	75 - 125	8	20
Thallium	ND	^1+	107	108	^1+	mg/Kg	☼	101	75 - 125	8	20
Vanadium	22		53.4	64.8		mg/Kg	☼	80	75 - 125	5	20
Zinc	68		53.4	112		mg/Kg	☼	83	75 - 125	7	20

Lab Sample ID: 590-23482-3 MSD
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	310	^1+	53.4	359	^1+ 4	mg/Kg	☼	101	75 - 125	3	20
Potassium	1300		2670	3600		mg/Kg	☼	85	75 - 125	11	20

Lab Sample ID: 590-23482-3 DU
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	9800		9250		mg/Kg	☼	6	20
Antimony	ND	^1+	ND	^1+	mg/Kg	☼	NC	20
Arsenic	5.1		3.92	J F5	mg/Kg	☼	27	20
Barium	47		44.1		mg/Kg	☼	6	20
Beryllium	ND		ND		mg/Kg	☼	NC	20
Cadmium	ND		ND		mg/Kg	☼	NC	20
Calcium	19000	F2	23800		mg/Kg	☼	20	20

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 590-23482-3 DU
Matrix: Solid
Analysis Batch: 46192

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chromium	16		14.2		mg/Kg	☼	14	20
Cobalt	6.9		6.90		mg/Kg	☼	0.3	20
Copper	15	J	14.2	J	mg/Kg	☼	6	20
Iron	18000		17400		mg/Kg	☼	6	20
Lead	16		15.0		mg/Kg	☼	9	20
Magnesium	9500	F1	8620		mg/Kg	☼	10	20
Manganese	310	^1+	347	^1+	mg/Kg	☼	11	20
Nickel	16		16.2		mg/Kg	☼	0.2	20
Selenium	ND		ND		mg/Kg	☼	NC	20
Silver	ND		ND		mg/Kg	☼	NC	20
Sodium	150		144		mg/Kg	☼	7	20
Thallium	ND	^1+	ND	^1+	mg/Kg	☼	NC	20
Vanadium	22		20.8		mg/Kg	☼	5	20
Zinc	68		67.7		mg/Kg	☼	0.06	20

Lab Sample ID: 590-23482-3 DU
Matrix: Solid
Analysis Batch: 46200

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46161

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Manganese	310	^1+	344	^1+	mg/Kg	☼	12	20
Potassium	1300		1220		mg/Kg	☼	9	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-46160/9-A
Matrix: Solid
Analysis Batch: 46173

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46160

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	12	ug/Kg		03/07/24 11:05	03/07/24 16:36	1

Lab Sample ID: LCS 590-46160/8-A
Matrix: Solid
Analysis Batch: 46173

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46160

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hg	200	198		ug/Kg		99	80 - 120

Lab Sample ID: 590-23482-3 MS
Matrix: Solid
Analysis Batch: 46173

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46160

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Hg	17	J F1	206	227		ug/Kg	☼	102	80 - 120

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Method: 7471B - Mercury (CVAA) (Continued)

Lab Sample ID: 590-23482-3 MSD
Matrix: Solid
Analysis Batch: 46173

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46160

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hg	17	J F1	195	270	F1	ug/Kg	☼	130	80 - 120	17	20

Lab Sample ID: 590-23482-3 DU
Matrix: Solid
Analysis Batch: 46173

Client Sample ID: IONE-BG-3-022924
Prep Type: Total/NA
Prep Batch: 46160

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Hg	17	J F1		17.6	J	ug/Kg	☼			6	20

Lab Chronicle

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Client Sample ID: IONE-BG-3-022924
Lab Sample ID: 590-23482-3
Date Collected: 02/29/24 09:07
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-3-022924
Lab Sample ID: 590-23482-3
Date Collected: 02/29/24 09:07
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 88.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.43 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:04	AMB	EET SPK
Total/NA	Prep	3050B			1.43 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 15:46	AMB	EET SPK
Total/NA	Prep	7471B			0.58 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 16:39	AMB	EET SPK

Client Sample ID: IONE-BG-4-022924
Lab Sample ID: 590-23482-4
Date Collected: 02/29/24 09:14
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-4-022924
Lab Sample ID: 590-23482-4
Date Collected: 02/29/24 09:14
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 83.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.27 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:29	AMB	EET SPK
Total/NA	Prep	3050B			1.27 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 16:10	AMB	EET SPK
Total/NA	Prep	7471B			0.71 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 16:49	AMB	EET SPK

Client Sample ID: IONE-BG-5-022924
Lab Sample ID: 590-23482-5
Date Collected: 02/29/24 09:22
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-5-022924

Lab Sample ID: 590-23482-5
Date Collected: 02/29/24 09:22
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 86.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.48 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:33	AMB	EET SPK
Total/NA	Prep	3050B			1.48 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 16:15	AMB	EET SPK
Total/NA	Prep	7471B			0.77 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 16:51	AMB	EET SPK

Client Sample ID: IONE-BG-8-022924

Lab Sample ID: 590-23482-8
Date Collected: 02/29/24 09:48
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-8-022924

Lab Sample ID: 590-23482-8
Date Collected: 02/29/24 09:48
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.34 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:49	AMB	EET SPK
Total/NA	Prep	3050B			1.34 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 16:31	AMB	EET SPK
Total/NA	Prep	7471B			0.71 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 16:54	AMB	EET SPK

Client Sample ID: IONE-BG-9-022924

Lab Sample ID: 590-23482-9
Date Collected: 02/29/24 09:50
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-9-022924

Lab Sample ID: 590-23482-9
Date Collected: 02/29/24 09:50
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 77.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.70 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:53	AMB	EET SPK
Total/NA	Prep	3050B			1.70 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 16:35	AMB	EET SPK
Total/NA	Prep	7471B			0.74 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 16:57	AMB	EET SPK

Lab Chronicle

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Client Sample ID: IONE-BG-10-022924
Date Collected: 02/29/24 10:04
Date Received: 02/29/24 16:13

Lab Sample ID: 590-23482-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			46137	03/06/24 10:34	JSP	EET SPK

Client Sample ID: IONE-BG-10-022924
Date Collected: 02/29/24 10:04
Date Received: 02/29/24 16:13

Lab Sample ID: 590-23482-10
Matrix: Solid
Percent Solids: 75.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.50 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46192	03/08/24 11:57	AMB	EET SPK
Total/NA	Prep	3050B			1.50 g	50 mL	46161	03/07/24 11:07	AMB	EET SPK
Total/NA	Analysis	6010D		5			46200	03/08/24 16:39	AMB	EET SPK
Total/NA	Prep	7471B			0.68 g	50 mL	46160	03/07/24 11:05	AMB	EET SPK
Total/NA	Analysis	7471B		1			46173	03/07/24 17:04	AMB	EET SPK

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23482-2

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET SPK
7471B	Mercury (CVAA)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
3050B	Preparation, Metals	SW846	EET SPK
7471B	Preparation, Mercury	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

>> Select a Laboratory or Service Center <<
#N/A
#N/A
#N/A
##

Chain of Custody Record

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Regulatory Program ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact	Project Manager: Joshua Lee	Site Contact	Date:	COC No: 1
Arcadis U.S. INC	Email joshua.lee@arcadis.com	Lab Contact:	Carrier	1 of 1 COCs
1420 5th Avenue, Suite 2400	Tel/Fax: 406-239-7810			TALS Project #
Seattle, WA 98101	Analysis Turnaround Time			Sampler: Garrett Wilson
406-239-7810	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below ____24-hour rush____			Walk-in Client.
Project Name: Hecla-Ione	☐ 2 weeks			Lab Sampling.
Site: Ione	☐ 1 week			Job / SDG No.
P O #	☐ 2 days			
	☑ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TAL Metals	TAL Metals	Sample Specific Notes.
IONE-BG-1-022924	2/29/2024	0846	G	S	1	N		↓	X	24-hour rush tat
IONE-BG-2-022924	2/29/24	0955	G	S		N			X	24-hour rush tat
IONE-BG-3-022924	2/29/24	0907	G	S		N				Hold at lab
IONE-BG-4-022924	2/29/24	0914	G	S		N				Hold at lab
IONE-BG-5-022924	2/29/24	0922	G	S		N				Hold at lab
IONE-BG-6-022924	2/29/24	0933	G	S		N			X	24-hour rush tat
IONE-BG-7-022924	2/29/24	0936	G	S		N			X	24-hour rush tat
IONE-BG-8-022924	2/29/24	0948	G	S		N				Hold at lab
IONE-BG-9-022924	2/29/24	0950	G	S		N				Hold at lab
IONE-BG-10-022924	2/29/24	1004	G	S		N				Hold at lab

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification.
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may

590-23482 Chain of Custody

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

month)

Special Instructions/QC Requirements & Comments
~~#3 Soil~~ #24-hour rush TAT on BG 1,2,6 & 7 All remaining samples hold at lab#

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.		Cooler Temp. (°C). Obs'd: 3.9 Corr'd: 4.0		Therm ID No.: IR Gun
Relinquished by: Garrett Wilson	Company: Arcadis	Date/Time: 2/29/24 1613	Received by:	Company: EET SPO	Date/Time: 2/29/24 1613
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Arcadis U.S., Inc.

Job Number: 590-23482-2

Login Number: 23482
List Number: 1
Creator: Morris, Mackenzie 1

List Source: Eurofins Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Josh Lee
ARCADIS U.S., Inc
695 N. Legacy Ridge Drive
Suite 200
Liberty Lake, Washington 99019

Generated 2/22/2024 7:49:48 PM

JOB DESCRIPTION

HECLA

JOB NUMBER

590-23298-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

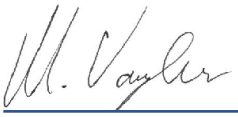
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Madison Vaughan, Analyst I
Madison.Vaughan@et.eurofinsus.com
Designee for
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

Table of Contents

Job ID: 590-23298-1 — Eurofins Spokane

Job Narrative
590-23298-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 2/19/2024 10:18 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.3°C.

Metals
Method 6010D: The following sample was diluted due to the abundance of non-target analytes: WASTE-1-021624 (590-23298-1). Elevated reporting limits (RLs) are provided.

Method 6010D: In order to meet the client requested TAT, the sample was reported before the DU/MS/MSD were finished being analyzed. WASTE-1-021624 (590-23298-1)

Method 6010D - TCLP: The method blank for preparation batch 590-45898 and 590-45938 and analytical batch 590-45940 contained Barium above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 7471B: For the following samples, the DU\MS\MSD were not reported to meet client TAT. QC will be ready next day WASTE-1-021624 (590-23298-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-23298-1	WASTE-1-021624	Solid	02/16/24 14:00	02/19/24 10:18

Definitions/Glossary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample ID: WASTE-1-021624

Lab Sample ID: 590-23298-1
Date Collected: 02/16/24 14:00
Matrix: Solid
Date Received: 02/19/24 10:18

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		02/21/24 09:47	02/21/24 17:42	1
Barium	**0.62**	**B**	0.025	0.0014	mg/L		02/21/24 09:47	02/21/24 17:42	1
Cadmium	**0.14**		0.025	0.0012	mg/L		02/21/24 09:47	02/21/24 17:42	1
Chromium	**0.011**	**J**	0.025	0.0017	mg/L		02/21/24 09:47	02/21/24 17:42	1
Lead	**120**		3.0	0.26	mg/L		02/21/24 09:47	02/21/24 18:16	50
Selenium	ND		0.10	0.049	mg/L		02/21/24 09:47	02/21/24 17:42	1
Silver	ND		0.025	0.0025	mg/L		02/21/24 09:47	02/21/24 17:42	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.20	0.090	ug/L		02/21/24 09:50	02/22/24 11:42	1

Client Sample ID: WASTE-1-021624

Lab Sample ID: 590-23298-1
Date Collected: 02/16/24 14:00
Matrix: Solid
Date Received: 02/19/24 10:18
Percent Solids: 94.9

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		890	350	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Barium	ND		890	240	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Cadmium	**2300**		710	42	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Chromium	ND		890	130	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Lead	**33000**		2100	1000	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Selenium	ND		3600	2100	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000
Silver	ND		890	200	mg/Kg	☼	02/22/24 11:53	02/22/24 14:49	1000

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**280000**		21000	5300	ug/Kg	☼	02/22/24 11:55	02/22/24 16:21	500

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 590-45938/1-A
Matrix: Solid
Analysis Batch: 45940

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45938

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.00	0.914		mg/L		91	80 - 120
Barium	1.00	0.829		mg/L		83	80 - 120
Cadmium	0.500	0.472		mg/L		94	80 - 120
Chromium	0.500	0.460		mg/L		92	80 - 120
Lead	0.500	0.497		mg/L		99	80 - 120
Selenium	1.00	0.933		mg/L		93	80 - 120
Silver	0.0500	0.0446		mg/L		89	80 - 120

Lab Sample ID: MB 590-45947/2-A
Matrix: Solid
Analysis Batch: 45953

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45947

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.3	0.50	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Barium	ND		1.3	0.34	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Cadmium	ND		1.0	0.059	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Chromium	ND		1.3	0.18	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Lead	ND		3.0	1.5	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Selenium	ND		5.0	3.0	mg/Kg		02/22/24 11:53	02/22/24 14:16	1
Silver	ND		1.3	0.29	mg/Kg		02/22/24 11:53	02/22/24 14:16	1

Lab Sample ID: LCS 590-45947/1-A
Matrix: Solid
Analysis Batch: 45953

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45947

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	50.0	49.4		mg/Kg		99	80 - 120
Barium	50.0	45.4		mg/Kg		91	80 - 120
Cadmium	25.0	25.1		mg/Kg		101	80 - 120
Chromium	25.0	25.2		mg/Kg		101	80 - 120
Lead	25.0	26.4		mg/Kg		106	80 - 120
Selenium	50.0	48.9		mg/Kg		98	80 - 120
Silver	2.50	2.35		mg/Kg		94	80 - 120

Lab Sample ID: LB 590-45898/1-B
Matrix: Solid
Analysis Batch: 45940

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 45938

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		02/21/24 09:47	02/21/24 13:38	1
Barium	0.00464	J	0.025	0.0014	mg/L		02/21/24 09:47	02/21/24 13:38	1
Cadmium	ND		0.025	0.0012	mg/L		02/21/24 09:47	02/21/24 13:38	1
Chromium	ND		0.025	0.0017	mg/L		02/21/24 09:47	02/21/24 13:38	1
Lead	ND		0.060	0.0051	mg/L		02/21/24 09:47	02/21/24 13:38	1
Selenium	ND		0.10	0.049	mg/L		02/21/24 09:47	02/21/24 13:38	1
Silver	ND		0.025	0.0025	mg/L		02/21/24 09:47	02/21/24 13:38	1

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-45948/9-A
Matrix: Solid
Analysis Batch: 45956

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45948

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	12	ug/Kg		02/22/24 11:55	02/22/24 16:29	1

Lab Sample ID: LCS 590-45948/8-A
Matrix: Solid
Analysis Batch: 45956

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45948

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Hg			200	200		ug/Kg		100	80 - 120		

Lab Chronicle

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Client Sample ID: WASTE-1-021624

Lab Sample ID: 590-23298-1

Date Collected: 02/16/24 14:00

Matrix: Solid

Date Received: 02/19/24 10:18

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			100.97 g	2000.08 mL	45898	02/19/24 16:14	AMB	EET SPK
TCLP	Prep	3010A			50 mL	50 mL	45938	02/21/24 09:47	AMB	EET SPK
TCLP	Analysis	6010D		1			45944	02/21/24 17:42	AMB	EET SPK
TCLP	Leach	1311			100.97 g	2000.08 mL	45898	02/19/24 16:14	AMB	EET SPK
TCLP	Prep	3010A			50 mL	50 mL	45938	02/21/24 09:47	AMB	EET SPK
TCLP	Analysis	6010D		50			45944	02/21/24 18:16	AMB	EET SPK
TCLP	Leach	1311			100.97 g	2000.08 mL	45898	02/19/24 16:14	AMB	EET SPK
TCLP	Prep	7470A			50 mL	50 mL	45939	02/21/24 09:50	AMB	EET SPK
TCLP	Analysis	7470A		1			45945	02/22/24 11:42	AMB	EET SPK
Total/NA	Analysis	Moisture		1			45897	02/19/24 15:50	AMB	EET SPK

Client Sample ID: WASTE-1-021624

Lab Sample ID: 590-23298-1

Date Collected: 02/16/24 14:00

Matrix: Solid

Date Received: 02/19/24 10:18

Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.48 g	50 mL	45947	02/22/24 11:53	AMB	EET SPK
Total/NA	Analysis	6010D		1000			45953	02/22/24 14:49	AMB	EET SPK
Total/NA	Prep	7471B			0.62 g	50 mL	45948	02/22/24 11:55	AMB	EET SPK
Total/NA	Analysis	7471B		500			45956	02/22/24 16:21	AMB	EET SPK

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: ARCADIS U.S., Inc
Project/Site: HECLA

Job ID: 590-23298-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET SPK
7470A	Mercury (CVAA)	SW846	EET SPK
7471B	Mercury (CVAA)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
1311	TCLP Extraction	SW846	EET SPK
3010A	Preparation, Total Metals	SW846	EET SPK
3050B	Preparation, Metals	SW846	EET SPK
7470A	Preparation, Mercury	SW846	EET SPK
7471B	Preparation, Mercury	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

>> Select a Laboratory or Service Center <<
#N/A
#N/A
#N/A
##

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact	Project Manager: Joshua Lee	Site Contact:	Date:	COC No:
Arcadis U.S. INC	Email: joshua.lee@arcadis.com	Lab Contact:	Carrier	___1___ of ___1___ COCs
1420 5th Avenue, Suite 2400	Tel/Fax: 406-239-7810			TALS Project #:
Seattle, WA 98101	**Analysis Turnaround Time**			Sampler:
(406)- 239-7810 Phone	☐ CALENDAR DAYS ☑ WORKING DAYS			**For Lab Use Only:**
(xxx) xxx-xxxx FAX	TAT if different from Below ___24 hour rush_____			Walk-in Client
Project Name: Hecla-Ione	☐ 2 weeks			Lab Sampling:
Site: Ione	☐ 1 week			
P O #	☐ 2 days			Job / SDG No
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	RCRA TOTAL METALS (Y/N)	RCRA Metals TCLP (Y/N)	Sample Specific Notes:
WASTE 1-021624	2/16/2024	1400	G	S		N	N	Y	Y	

590-23298 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments.

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No. | Cooler Temp. (°C) Obs'd: 4.2 Corr'd. 4.3 | Therm ID No.: IR0016

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Garrett Wilson	Arcadis	2/19/24@1019		EET SLC	2/19/24 1056
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc

Job Number: 590-23298-1

Login Number: 23298
List Number: 1
Creator: Morris, Mackenzie 1

List Source: Eurofins Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Josh Lee
Arcadis U.S., Inc.
695 N. Legacy Ridge Drive
Suite 200
Liberty Lake, Washington 99019

Generated 3/6/2024 7:26:21 PM

JOB DESCRIPTION

HECLA

JOB NUMBER

590-23483-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

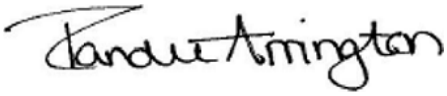
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

Table of Contents

Job Narrative
590-23483-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 2/29/2024 4:13 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.0°C.

Metals
Method 6010D - TCLP: The method blank for preparation batch 590-46130 and 590-46135 and analytical batch 590-46151 contained Barium and Chromium above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 7470A - TCLP: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 590-46130 and 590-46136 and analytical batch 590-46154 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23483-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-23483-1	WASTE-2-022924	Solid	02/29/24 12:07	02/29/24 16:13

Definitions/Glossary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23483-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23483-1

Client Sample ID: WASTE-2-022924
Date Collected: 02/29/24 12:07
Date Received: 02/29/24 16:13

Lab Sample ID: 590-23483-1
Matrix: Solid
Percent Solids: 79.3

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.1	0.44	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Barium	ND		1.1	0.30	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Cadmium	ND		0.89	0.053	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Chromium	ND		1.1	0.16	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Lead	ND		2.7	1.3	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Selenium	ND		4.5	2.7	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1
Silver	ND		1.1	0.26	mg/Kg	☼	03/04/24 10:34	03/04/24 15:59	1

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		03/05/24 10:56	03/06/24 12:11	1
Barium	**0.79**	**B**	0.025	0.0014	mg/L		03/05/24 10:56	03/06/24 12:11	1
Cadmium	ND		0.025	0.0012	mg/L		03/05/24 10:56	03/06/24 12:11	1
Chromium	**0.0027**	**J B**	0.025	0.0017	mg/L		03/05/24 10:56	03/06/24 12:11	1
Lead	**0.086**		0.060	0.0051	mg/L		03/05/24 10:56	03/06/24 12:11	1
Selenium	ND		0.10	0.049	mg/L		03/05/24 10:56	03/06/24 12:11	1
Silver	ND		0.025	0.0025	mg/L		03/05/24 10:56	03/06/24 12:11	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND	F1	0.20	0.090	ug/L		03/05/24 10:38	03/06/24 13:35	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**70**		46	12	ug/Kg	☼	03/04/24 10:32	03/04/24 16:08	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-46099/2-A
Matrix: Solid
Analysis Batch: 46110

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46099

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.3	0.50	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Barium	ND		1.3	0.34	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Cadmium	ND		1.0	0.059	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Chromium	ND		1.3	0.18	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Lead	ND		3.0	1.5	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Selenium	ND		5.0	3.0	mg/Kg		03/04/24 10:34	03/04/24 14:33	1
Silver	ND		1.3	0.29	mg/Kg		03/04/24 10:34	03/04/24 14:33	1

Lab Sample ID: LCS 590-46099/1-A
Matrix: Solid
Analysis Batch: 46110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46099

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	96.5		mg/Kg		97	80 - 120
Barium	100	86.0		mg/Kg		86	80 - 120
Cadmium	50.0	49.0		mg/Kg		98	80 - 120
Chromium	50.0	47.7		mg/Kg		95	80 - 120
Lead	50.0	50.8		mg/Kg		102	80 - 120
Selenium	100	96.3		mg/Kg		96	80 - 120
Silver	5.00	4.91		mg/Kg		98	80 - 120

Lab Sample ID: LCS 590-46135/1-A
Matrix: Solid
Analysis Batch: 46151

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46135

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	2.00	1.95		mg/L		97	80 - 120
Barium	2.00	1.74		mg/L		87	80 - 120
Cadmium	1.00	1.00		mg/L		100	80 - 120
Chromium	1.00	0.989		mg/L		99	80 - 120
Lead	1.00	1.04		mg/L		104	80 - 120
Selenium	2.00	1.94		mg/L		97	80 - 120
Silver	0.100	0.102		mg/L		102	80 - 120

Lab Sample ID: LB 590-46130/1-B
Matrix: Solid
Analysis Batch: 46151

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 46135

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.025	0.010	mg/L		03/05/24 10:56	03/06/24 11:36	1
Barium	0.00449	J	0.025	0.0014	mg/L		03/05/24 10:56	03/06/24 11:36	1
Cadmium	ND		0.025	0.0012	mg/L		03/05/24 10:56	03/06/24 11:36	1
Chromium	0.00177	J	0.025	0.0017	mg/L		03/05/24 10:56	03/06/24 11:36	1
Lead	ND		0.060	0.0051	mg/L		03/05/24 10:56	03/06/24 11:36	1
Selenium	ND		0.10	0.049	mg/L		03/05/24 10:56	03/06/24 11:36	1
Silver	ND		0.025	0.0025	mg/L		03/05/24 10:56	03/06/24 11:36	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 590-46136/8-A
Matrix: Solid
Analysis Batch: 46154

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46136

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Hg			2.00	1.82		ug/L		91	80 - 120		

Lab Sample ID: LB 590-46130/1-C
Matrix: Solid
Analysis Batch: 46154

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 46136

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.20	0.090	ug/L		03/05/24 10:38	03/06/24 13:33	1

Lab Sample ID: 590-23483-1 MS
Matrix: Solid
Analysis Batch: 46154

Client Sample ID: WASTE-2-022924
Prep Type: TCLP
Prep Batch: 46136

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Hg	ND	F1	2.00	1.55	F1	ug/L		78	80 - 120		

Lab Sample ID: 590-23483-1 MSD
Matrix: Solid
Analysis Batch: 46154

Client Sample ID: WASTE-2-022924
Prep Type: TCLP
Prep Batch: 46136

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hg	ND	F1	2.00	1.76		ug/L		88	80 - 120	13	20

Lab Sample ID: 590-23483-1 DU
Matrix: Solid
Analysis Batch: 46154

Client Sample ID: WASTE-2-022924
Prep Type: TCLP
Prep Batch: 46136

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hg	ND	F1	ND		ug/L		NC	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-46098/9-A
Matrix: Solid
Analysis Batch: 46111

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 46098

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	12	ug/Kg		03/04/24 10:32	03/04/24 15:29	1

Lab Sample ID: LCS 590-46098/8-A
Matrix: Solid
Analysis Batch: 46111

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 46098

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Hg			200	191		ug/Kg		96	80 - 120		

Lab Chronicle

Client: Arcadis U.S., Inc.
Job ID: 590-23483-1
Project/Site: HECLA

Client Sample ID: WASTE-2-022924
Lab Sample ID: 590-23483-1

Date Collected: 02/29/24 12:07
Matrix: Solid
Date Received: 02/29/24 16:13

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			100.52 g	2000.73 mL	46130	03/04/24 15:10	AMB	EET SPK
TCLP	Prep	3010A			50 mL	50 mL	46135	03/05/24 10:56	AMB	EET SPK
TCLP	Analysis	6010D		1			46151	03/06/24 12:11	AMB	EET SPK
TCLP	Leach	1311			100.52 g	2000.73 mL	46130	03/04/24 15:10	AMB	EET SPK
TCLP	Prep	7470A			50 mL	50 mL	46136	03/05/24 10:38	AMB	EET SPK
TCLP	Analysis	7470A		1			46154	03/06/24 13:35	AMB	EET SPK
Total/NA	Analysis	Moisture		1			46103	03/04/24 11:24	M1M	EET SPK

Client Sample ID: WASTE-2-022924
Lab Sample ID: 590-23483-1

Date Collected: 02/29/24 12:07
Matrix: Solid
Date Received: 02/29/24 16:13
Percent Solids: 79.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.41 g	50 mL	46099	03/04/24 10:34	AMB	EET SPK
Total/NA	Analysis	6010D		1			46114	03/04/24 15:59	AMB	EET SPK
Total/NA	Prep	7471B			0.68 g	50 mL	46098	03/04/24 10:32	AMB	EET SPK
Total/NA	Analysis	7471B		1			46111	03/04/24 16:08	AMB	EET SPK

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23483-1

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Arcadis U.S., Inc.
Project/Site: HECLA

Job ID: 590-23483-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET SPK
7470A	Mercury (CVAA)	SW846	EET SPK
7471B	Mercury (CVAA)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
1311	TCLP Extraction	SW846	EET SPK
3010A	Preparation, Total Metals	SW846	EET SPK
3050B	Preparation, Metals	SW846	EET SPK
7470A	Preparation, Mercury	SW846	EET SPK
7471B	Preparation, Mercury	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

>> Select a Laboratory or Service Center <<
#N/A
#N/A
#N/A
##

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact	Project Manager: Josh Lee	Site Contact	Date	COC No: 1
Arcadis U.S. INC	Email joshua.lee@arcadis.com	Lab Contact	Carrier:	_1_ of _1_ COCs
1420 5th Avenue, Suite 2400	Tel/Fax:406-239-7810			TALS Project #
Seattle, WA 98101	**Analysis Turnaround Time**			Sampler:
(814)969-6999 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(xxx) xxx-xxxx FAX	TAT if different from Below _____			Walk-in Client:
Project Name Hecla-Ione	☐ 2 weeks			Lab Sampling:
Site: Ione	☐ 1 week			Job / SDG No.
P O #	☐ 2 days ☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Metals (Zn)	RCRA Total Metals	RCRA Metals TCLP	Sample Specific Notes.
WASTE-2-022924	2/29/2024	1207	C	S	1	N			X	X	3-day TAT

590-23483 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☐ Non-Hazard ☑ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments
3-day TAT

Custody Seals Intact. ☐ Yes ☐ No	Custody Seal No.		Cooler Temp. (°C) Obs'd. 3.9 Corr'd: 4.0		Therm ID No.: IR005
Relinquished by: Garrett Wilson	Company: Arcadis	Date/Time: 2/29/24 1613	Received by:	Company: EET 880	Date/Time: 2/29/24 1613
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Arcadis U.S., Inc.

Job Number: 590-23483-1

Login Number: 23483

List Source: Eurofins Spokane

List Number: 1

Creator: Morris, Mackenzie 1

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix E

Waste Disposal Documentation

Form Approved. OMB No. 2050-0039

.AZARDOUS .. MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
				FLE

.erator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name — Signature — Month Day Year

GENERATOR

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name — Signature — Month Day Year

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

Chemical Waste Management Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 11:34:37 2024-04-25
ID: 59 TRK ID: 506489
99840 lb G

OUTBOUND
T/D: 12:36:38 2024-04-25
ID: 59 TRK ID: 506439
99840 lb G
43260 lb PT
56580 lb N

NET 28.29 TONS

GENERATOR _____

903-ARLINGTON_OR

Form Approved. OMB No. 2050-0039

Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
		018615 11 FLE

Generator's Site Address (if different than mailing address)

U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		

onsignment are fully and accurately described above by the proper shipping name, and are classified, packaged, ding to applicable international and national governmental regulations. If export shipment and I am the Primary EPA Acknowledgment of Consent.
quantity generator) or (b) (if I am a small quantity generator) is true.

Signature | Month | Day | Year

Export from U.S. Port of entry/exit: _____
Date leaving U.S.: _____

Signature | Month | Day | Year

Signature | Month | Day | Year

☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Form Approved. OMB No. 2050-0039

2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
		018615610 FLE

Mailing Address | Generator's Site Address (if different than mailing address)

GENERATOR

Generator's Phone:

6. Transporter 1 Company Name | U.S. EPA ID Number

7. Transporter 2 Company Name | U.S. EPA ID Number

8. Designated Facility Name and Site Address | U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name | Signature | Month | Day | Year

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) | U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name | Signature | Month | Day | Year

Form Approved. OMB No. 2050-0039

...mical Waste Management Of The Northwest

WASTE MANAGEMENT

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 11:30:56 2024-04-25
ID: 77 TRK ID: 506485
99160 lb G

OUTBOUND
T/D: 13:04:25 2024-04-25
ID: 77 TRK ID: 506485
99160 lb G
43440 lb PT
55720 lb N

NET 27.86 TONS

GENERATOR _____

903-ARLINGTON_OR

2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number 01861561O FLE

Generator's Site Address (if different than mailing address)

U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	No.	Type					

t are fully and accurately described above by the proper shipping name, and are classified, packaged, licable international and national governmental regulations. If export shipment and I am the Primary wledgment of Consent.
nerator) or (b) (if I am a small quantity generator) is true.

Signature — Month Day Year

U.S. Port of entry/exit: _____
Date leaving U.S.: _____

ature — Month Day Year

ature — Month Day Year

☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

TRANSPORTER INT'L

DESIGNATED FACILITY

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Arcadis U.S., Inc.
1420 5th Avenue, Suite 2400
Seattle, WA 98101
United States
Phone: 206 325 5254
www.arcadis.com