25 May, 2022

VIA EMAIL

Ms. Jessica Hall
ADEC CSP
555 Cordova Street
Anchorage, AK 99501
1laska1.hall@alaska.gov

Re: HGCMC Concentrate Storage Building, Revised May 2022

Dear Ms. Hall:

The following report documents Hecla Greens Creek Mining Company's (HGCMC) additional cleanup of contaminated soil from around the perimeter of the Concentrate Storage Building (CSB). This revised report incorporates comments from the Alaska Department of Environmental Conservation's (ADEC) October 5, 2021 letter. The Site is listed in the ADEC Contaminated Site Database under File # 1513.38.120 and Hazard ID# 27226. The nearest potable water intake is located on Cannery Creek, 2,500 feet away from the CSB and 155 feet higher in elevation (upgradient). According to the ADEC Drinking Water Protection Map, the CSB is not located within a drinking water protection area. The CSB is approximately 50 feet from Hawk Inlet.

Introduction

During an Environmental Protection Agency (EPA) inspection in August 2019, lead and zinc concentrate material was observed on the ground around the perimeter of the CSB located at HGCMC's port facility. Upon investigation, HGCMC discovered that concentrate had slipped between the framing and corrugated metal siding of the CSB. Within days after the inspection, HGCMC developed a plan to seal the building to prevent the further escape of concentrate material. By November 2019, HGCMC obtained a bid from Statewide Foam & Coatings, LLC to seal the CSB using foam and a waterproof, spray-on membrane.

Due to winter conditions, the contractor advised the work needed to be completed in the spring, and a contract was executed in March 2020. However, due to the impacts of the COVID-19 pandemic, the project was delayed until the summer. The CSB was sealed in early August 2020. See HGCMC's 27 August 2020 letter for additional information regarding the completion of the work (attached). Prior to completion of the sealing, HGCMC stored concentrate materials away from the exterior corrugated metal walls and has periodically inspected the exterior of the CSB to ensure that no additional material had escaped. Cleanup activities began after the CSB had been sealed.

Work to date has been completed in two phases. Phase I consisted of hand removing soils visibly impacted by the concentrate from around the CSB and sampling of remaining soils to determine if additional cleanup was necessary. Using that data to determine appropriate Decision Units (DU), Phase II consisted of incremental sampling around the CSB and cleanup of areas where incremental sampling indicated soils remained impacted by lead and zinc. After excavation of each DU, discrete samples were collected to confirm clean. Phase II has been partially completed and additional soil removal remains necessary in DU-2.

Phase I activities were reported to the ADEC in letters dated 12 May 2020 (attached). This report documents Phase II activities undertaken by HGCMC to date. Additional work is required in DU-2 and will be discussed in a separate workplan to be submitted to the ADEC after approval of this report.

Objectives

The objective of the Phase 2 activities was to remove soil around the perimeter of the CSB that contained lead or zinc in concentrations above cleanup levels approved by the ADEC. Following characterization, impacted soils above cleanup levels would be excavated, placed in appropriate containers, characterized and properly disposed.

Cleanup Levels

Cleanup levels for lead are based on land use. For industrial land use, as applied in 18 AAC 75.341, the soil cleanup level is 800 mg/kg. The applicable soil cleanup level for zinc, in a zone with greater than 40 inches of precipitation, is 25,000 mg/kg. HGCMC proposed these cleanup levels in our letter dated 12 May 2020, and they were approved by ADEC via email on 28 August 2020 (attached). However, based on multi-incremental sampling, after removal of concentrates from the exterior of the building tested soils met the most stringent (Migration to Groundwater) cleanup levels of 4,900 mg/Kg for zinc.

Previous Work

Under oversight from the Alaska Department of Environmental Conservation (ADEC) and consistent with HGCMC's letters dated 2 and 28 October 2019 to Mr. David Khan and HGCMC's letter to you dated 12 May 2020 (letters attached), HGCMC has followed a two-phase process to remove the lead and zinc concentrate from the perimeter of the CSB and investigate and remove any impacted soils. Phase 1, which occurred in October 2019 and again in August 2020, involved the recovery of approximately 3 cubic yards of concentrate-laden soil from discrete surface areas around the perimeter of the CSB. Approximately 1.5 cubic yards was removed using hand shovels in October 2019. We reported these activities to you in a letter dated 12 May 2020.

After the CSB was sealed, HGCMC used a vacuum truck to remove another 1.5 cubic yards of concentrate and soil in August 2020. In both instances, the recovered product was reprocessed in the mill for metals recovery. After product recovery of the concentrate around the exterior of the CSB occurred, HGCMC collected soil samples to determine if additional cleanup was necessary.

Sampling completed in August 2019, showed the north and northeast sides of the CSB had the highest lead concentrations while the south and southeast sides had the highest zinc concentrations. This is consistent with the locations where the lead concentrate and zinc concentrate products are stored inside

the CSB. The sample results showed lead and zinc concentrations were elevated close to the foundation walls but generally decreased to background levels within three feet from the walls. Samples did not generally show elevated concentrations below a depth of 12 inches. These results were reported to ADEC in our letter dated 12 May 2020.

Based on the sampling information, the area of concern was limited to an approximately 3-ft. wide strip around the perimeter of the CSB on the north, east, and south sides, and to a depth of 12 inches. This information was used to determine appropriate Dus for Phase II of the project.

Methodology

Decision Units

The exterior of the CSB was divided into three separate Decision Units (DU) for the sampling plan based on laboratory results from August 2019. Figure 1 shows the location of each DU. The south side is DU1 and measures 115 feet in length. The southeast side is DU2 and measures 107 feet in length. The north and northeast sides were combined into DU3, which measures 200 feet in length.

Figure 1: Aerial view of CSB showing the location of the Dus for characterization sampling

Incremental Sampling

In order to determine if the mean concentration of lead or zinc was above applicable cleanup levels, HGCMC conducted incremental sampling in each of the three established Dus. Laboratory results of these characterization samples were used to guide additional cleanup, if needed. Sampling was conducted by Mr. David Landes, Chief Environmental Engineer at Hecla Greens Creek Mine. Mr. Landes is a Qualified Environmental Professional in accordance with 18 AAC 75.333I.

The measured length of each DU was divided by 10 to calculate the size of ten equal cells. Then, using a 300-ft. tape measure laid along the edge of the CSB, the midpoint of each cell was located. For example, DU3 was 200 feet long. This equates to ten cells, each 20 feet long. Starting at the northwest corner of the CSB, cell 1 extended from 0 to 20 feet with the mid-point at 10 feet, cell 2 extended from 20 to 40 feet with the mid-point at 30 feet, and so on.

Orange pin flags were placed at distances of 1 ft., 2 ft., and 3 ft. off the building wall at the mid-point of each cell. These marked the locations where 30 core samples, measuring 2-inch diameter by 12-inches deep, were collected from each DU. A new corer was used for each location.

Each core sample was sieved to remove rocks and larger materials that are not representative of the fine-grained concentrates. The sieved samples were combined into one container and homogenized to produce one bulk soil sample for each DU.

Sub-sampling of each sieved bulk sample was then conducted by spreading the entire sieved and homogenized sample out to a thin layer on a clean flat surface to create a slab cake. A grid of 30 uniform cells was laid out on the slab, and a level teaspoon was collected from each cell. A clean spoon was used for each subsample. These subsamples were placed into a clean sample container to form one incremental sample from a DU for laboratory analysis. The process was repeated for each bulk sample.

The three incremental characterization samples were sent to ACZ Laboratories, located in Steamboat Springs, Colorado, to be analyzed for total lead and total zinc via EPA Method 6010D. Samples were given unique identifications, collected into laboratory supplied containers, and sent to ACZ Laboratories under laboratory chain of custody procedures. Photos 1 through 8 show the process of collecting the characterization samples.

Discrete Sampling

Sampling was conducted by Mr. David Landes, Chief Environmental Engineer at Hecla Greens Creek Mine. Mr. Landes is a Qualified Environmental Professional in accordance with 18 AAC 75.333I. After cleanup activities in DU2 and DU3 were completed, HGCMC collected discrete soil samples from each DU to ensure the excavation had achieved clean limits. As sampling during Phase I activities showed lead and zinc impacted soils did not extend beyond three feet from the CSB, discrete samples were collected from the bottom of the excavation only.

Field screening for lead and zinc in soils requires an X-ray Florence device (XRF). HGCMC did not have access to an XRF and therefore field screening of soils could not occur. Confirmation samples were collected from areas most likely to be contaminated based on previous laboratory results, field observations, and visual indicators.

Samples were collected using reusable sampling media and placed in laboratory supplied containers. Sampling spoons were cleaned between each use. Samples were given unique identifications and sent under laboratory chain of custody procedures to ACZ Laboratories, located in Steamboat Springs, Colorado, to be analyzed for total lead and total zinc via EPA method 6010D.

Field Activities

Decision Unit 3 Cleanup

Soil removal began in DU3 on 26 September 2020 by excavating a trench approximately 4-ft. wide by 1-ft. deep along the exterior of the foundation. Large rocks were sorted by hand from the excavated material and placed back in the trench. Photos 9 through 12 show the first round of excavation. The material was placed in open-top totes and super sacks, then placed in a sealed shipping container. Discrete sampling methods, described in the Methodology Section, were used to collect confirmation samples from within the final limits of the excavation.

Seven confirmation samples were collected from the bottom of the excavation, four on the north side of the CSB and three on the northeast side. The approximate location of the samples is shown in Figure 2. The samples were sent to ACZ Laboratories and analyzed for total lead. As previous multi-incremental sampling within DU3 indicated zinc concentrations were below applicable 18 AAC 75 Migration to Groundwater Cleanup Levels, samples were not analyzed for zinc.

Laboratory results of the initial seven discrete samples indicated additional soil removal was required on the east half of the north side and on the southern part of the northeast side.

The second round of excavation on the east half of the north side of the CSB occurred on 17 October 2020. The existing trench was excavated about one foot deeper, and there was a noticeable difference in the color and odor of the soil in this depth interval. Large rocks were sorted by hand from the excavated material and placed back in the trench. The excavated material was placed in a lined, open-top, half-high shipping container. Photos 15 through 17 show the second round of excavation.

Two confirmation samples were collected from the bottom of the trench at approximately the same location as the previous confirmation samples (CSB North-C3 and CSB North-C4). Freezing conditions and a winter storm occurred prior to receiving the results from the confirmation samples collected on the northeast side of the CSB.

Therefore, the second round of excavation in this area was postponed until spring 2021. In May 2021, additional material was excavated from the south end of the northeast side. Approximately one cubic yard of soil was excavated and placed in a super sack. Based on results from a discrete sample collected after the second round of excavation, no additional soil removal was required on the northeast side of the CSB. Figure 2 shows the approximate locations of discrete confirmation samples collected within DU3.

Figure 2: Approximate confirmation sampling locations for DU2 and DU3.

Decision Unit 2 Cleanup

Excavation in DU2 occurred on 5 October 2020. The excavation was approximately 3-ft. wide by 1-ft. deep. Large rocks were sorted by hand from the excavated material and placed in the trench. The excavated material was placed in super sacks and stored inside a sealed shipping container. Two discrete confirmation samples were collected from the bottom of the excavation. The samples were sent to ACZ Laboratories and analyzed for total lead, consistent with the characterization results discussed above. Figure 2 shows the approximate locations of discrete samples collected in DU2.

Freezing conditions and a winter storm occurred prior to receiving the results from the confirmation samples. Confirmation samples indicated that additional soil should be removed from DU2, however work could not be completed immediately due to the onset of winter. Therefore, the second round of excavation in this area was postponed until spring 2021. Due again to weather, HGCMC was not able to complete the additional removal prior to the start of a major contracted project to replace the roof on the CSB, which began in early June, 2021.

HGCMC is planning to perform additional soil removal from the southeast side of the CSB using a vacuum truck. The soil will be placed in a super sack and characterized. HGCMC intends to complete the remaining work this year. A workplan will be submitted to the ADEC for approval prior to commencing additional work in DU2.

Decision Unit 1 Cleanup

In DU1, located on the south side of the CSB, the mean concentrations of both lead and zinc were below the applicable soil cleanup levels. Therefore, no additional soil removal was needed in that area.

Laboratory Results

Incremental Sampling

Incremental samples were collected as described in the Methodology section and analyzed for total lead and total zinc via EPA Method 6010D. Laboratory results are summarized in Table 1. Zinc concentrations were below the most stringent (18 AAC 75 Migration to Groundwater) Cleanup Levels of 4,900 mg/Kg. Total lead concentrations ranged from 427 mg/Kg within DU1 to 2,160 mg/Kg in DU3.

Table 1: Mean concentrations of Lead and Zinc in top 12 inches of soil around CSB

Location	Lead (mg/Kg)	Zinc (mg/Kg)
DU1 (CSB South)	427	3370
DU2 (CSB Southeast)	1450	2770
DU3 (CSB North/Northeast)	2160	1500

Decision Unit 3

Two rounds of confirmation sampling occurred within DU3. A total of seven discrete samples were collected from the DU3 excavation in October 2020. An additional composite sample was also collected. Discrete samples were analyzed by ACZ Laboratory in Steamboat Springs, CO for total lead via EPA Method 6010D. The composite sample was analyzed for TCLP of Lead. October 2020 DU3 laboratory results are summarized in Table 2.

Total lead ranged from 109 mg/Kg in samples CSB North-C1 to 5,240 mg/Kg in sample CSB North C-3. As these discrete samples indicated soils within the excavation did not meet cleanup levels, additional soil removal activities were conducted. An additional 12 inches of soil was removed from the northeast portion of DU3, which corresponded to samples CSB North-C3, CSB North C-4, and CSB NE-C3. The northern portion of DU3 had laboratory concentrations of total lead below Industrial Use cleanup levels in an Over 40 Inches Zone and were not further excavated.

Two discrete confirmation samples and three TCLP samples were submitted to ACZ Laboratory. The discrete samples were collected from the approximate locations of CSB North C-3 and CSB North C-4 after an additional foot of soil was removed. Total lead ranged from 117 mg/Kg to 342 mg/Kg and are below the most stringent (Migration to Groundwater) Cleanup Levels in 18 AAC 75. TCLP samples were collected for disposal characterization purposes only. Table 3 summarizes the results of discrete samples from the second round of laboratory samples from DU3. TCLP results will be discussed with disposal samples.

Table 2: Confirmation samples following first round of excavation in DU3

Sample ID	Description	Total Lead (mg/Kg)
CSB North-C1	Confirmation, north side – west, +12" depth	109
CSB North-C2	Confirmation, north side – mid-west, +12" depth	253
CSB North-C3	Confirmation, north side – mid-east, +12" depth	5240
CSB North-C4	Confirmation, north side – east, +12" depth	2190
CSB NE-C1	Confirmation, northeast side – north, +12" depth	247
CSB NE-C2	Confirmation, northeast side – middle, +12" depth	744
CSB NE-C3	Confirmation, northeast side – south, +12" depth	1430

Table 3: Confirmation samples following second round of excavation in DU3

Sample ID	Description	Total Lead (mg/Kg)
CSB-N-Rd2-C1	Confirmation, north side – mid-east, +24" depth, CSB North C-3 Location	342
CSB-N-Rd2-C1	Confirmation, north side – east, +24" depth, CSB North C-3 Location	117
CSB-East Trench	south end of the northeast side of CSB	211

Decision Unit 2

Two discrete confirmation samples were collected from DU2 after the initial round of soil removal. Discrete samples were analyzed by ACZ Laboratory in Steamboat Springs, CO for total lead via EPA Method 6010D. Total lead ranged from 633 mg/Kg to 1080 mg/Kg and are above cleanup levels. Laboratory results are summarized in Table 4.

Table 4: Confirmation samples following first round of excavation in DU2

Sample ID	Description	Total Lead (mg/Kg)
CSB SE-C1	Confirmation, northeast side	633
CSB SE-C2	Confirmation, northeast side	1080

Disposal Characterization

Composite samples were collected from the soils generated during the CSB cleanup for analysis using the Toxicity Characteristic Leachate Procedure (TCLP). All soils excavated from the north side of the CSB in DU3 were characterized as hazardous waste based on the lead TCLP result. This material was initially

stored in totes and super sacks but was consolidated and transferred to lined, half-high containers for shipping. Soil excavated in the first round on the northeast side was also characterized as hazardous waste based on the lead TCLP result. The soils excavated from DU2 on the southeast side of the CSB did not exhibit a hazardous waste characteristic. However, the soil was consolidated with the other excavated soil and disposed of off-site. The analytical results are shown in Table 5 below.

Table 5: Results from Soil Characterization Sampling (TCLP)

Sample ID	Description	Lead (µg/L)
CSB North RD1 E	Composite super sacks, north side-east half, 0-12"	23400
CSB North RD1 W	Composite totes, north side-west half, 0-12"	37300
CSB North RD2	Composite half-high, north side-east half, 12-24"	43600
TCLP NE	Composite super sacks, northeast side, 0-12"	7780
TCLP SE	Composite super sacks, southeast side, 0-12"	2500
CSB-East Waste	Composite super sack, northeast side, 12-24"	2000

Note: TCLP limit = 5000 µg/L

Soil Disposal

In December 2020, HGCMC shipped three full half-high containers and one container with super sacks of soil, weighing a total of 130,170 pounds, to Chemical Waste Management in Arlington, Oregon, for disposal. Copies of the hazardous waste manifests and certificates of disposal are attached. Also attached is a copy of the completed Contaminated Media Transport and Treatment or Disposal Approval Form required by the ADEC.

The TCLP result from the super sack of soil excavated from the northeast side of the CSB in May 2021 is below the lead limit; therefore, the soil is not a characteristic hazardous waste. That soil is currently being stored on-site. HGCMC is seeking concurrence from ADEC that the soil can be placed in the tailings facility.

Investigation Derived Waste

Lead and zinc concentrate removed from around the CSB was reprocessed through the mill as approved by the EPA. Soil removed from around the CSB with TCLP for lead results greater than the RCRA limit of 5,000 µg/L were shipped to an appropriate disposal landfill as described in the Soil Disposal section. Used disposable sampling and equipment supplies were double-bagged and disposed with other non-hazardous waste. Reusable sampling equipment was taken to the on-Site laboratory and decontaminated in accordance with HGCMC's internal Standard Operating Procedures. Water used to decontaminate reusable sampling equipment was treated in accordance with other water used in the on-Site laboratory.

Quality Control

The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to data quality objective (DQOs). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, matrix spike/matrix spike duplicates, method blank/method blank duplicate, and laboratory control sample/laboratory control sample duplicates to assess precision, accuracy, and matrix bias. If a DQO was not met, the project

laboratory provides a brief narrative within the Case Narrative concerning the problem. Laboratory reports, including the Case Narrative, are attached.

The goal of the project was to produce data of adequate quality for comparison to 18 AAC 75 Method II Migration to Groundwater Cleanup levels. The primary tool used to assess the quality of data is the ADEC Laboratory Data Review Checklist (LDRC). A LDRC was completed for each individual laboratory work order and is included. The laboratory report Case Narrative was reviewed against the ADEC LDRC for potential quality control issues. No issues were identified that would negatively affect data quality or usability.

Conceptual Site Model

A Conceptual Site Model (CSM) has been prepared for the Site and is attached to this report. According to the CSM, Incidental Soil Ingestion is the only complete pathway at the Site. However, the Site is a working lead and zinc mine with multiple internal operating procedures to protect workers from exposure to high levels of lead and zinc. HGCMC's internal operating procedures meet Occupational Safety and Health Administration (OSHA) requirements for protection of workers. As internal, OSHA compliant safety procedures are already in place, it is unlikely this open pathway will impact human health or safety at the Site.

Recommendations and Conclusions

Based on available data, the following conclusions can be made:

- In August 2019, lead and zinc concentrate was observed along the exterior perimeter of the Concentrate Storage Building
    - Samples were collected to determine total lead and zinc concentrations in the soil
        - Samples also served to delineate the impacted area
        - Lab results indicated the north and northeast sides of the building had the highest lead concentrations, the south and southeast sides had the highest zinc concentrations
- In October 2019 and August 2020 3.0 cubic yards of concentrate was removed from the building perimeter
    - This material was processed through the on-Site mill for metals recovery
- The building was sealed using foam and a waterproof coating in August 2020
    - The Covid-19 pandemic delayed the project
- Using data from August 2019, three Decision Units were established
- Incremental sampling techniques were used to determine the mean concentrations of lead and zinc in each DU
    - DU1 had total lead and zinc below cleanup levels and no further work was conducted
    - DU2 and DU3 had mean lead concentrations above cleanup levels
        - Mean zinc concentrations were below 18 AAC 75 Migration to Groundwater Cleanup Levels
- Cleanup of DU3 was completed in October 2020
    - Discrete samples from the excavation area were below Industrial use cleanup levels for an Over 40 Inches of rain Zone for total lead

        - Total lead at the final limits of excavation ranged from 109 mg/Kg to 744 mg/Kg
- Partial cleanup of DU2 occurred in October 2020
    - Twelve inches of soil was removed from DU2
        - Discrete samples from the initial excavation indicated additional soil removal was necessary
            - Total lead ranged from 633 mg/Kg to 1080 mg/Kg
- Winter weather and storms postponed additional soil removal in 2020
- A late winter thaw meant additional soil removal could not occur in 2021
    - Replacement of the Concentrate Storage Building roof meant personnel and equipment was not available to conduct additional soil removal after the spring 2021 thaw
- Soil removal is currently scheduled to occur in 2022
    - HGCMC will submit necessary workplans for needed work to the ADEC prior to commencing work
- A Conceptual Site Model was completed for the Site
    - The CSM indicates Incidental Soil Ingestion is the only completed pathway
    - On Site safety protocols at HGCMC are OSHA compliant and protective of workers' health and safety for this pathway

Based on the above conclusions, further removal of soils in DU2 are recommended. An ADEC approved workplan should be in place prior to commencing further work.

Please let me know if I can provide you with additional information.

Sincerely,

Christopher Wallace

Permitting and Environmental Compliance Coordinator
Hecla Greens Creek Mining Company

Attachments

A) Photo Pages
B) Laboratory Reports and LDRCs
C) Disposal Paperwork and Permission to Transport Form
D) Communications with ADEC
E) Conceptual Site Model

Attachment A

Photos

Photo 1: Core sampler used for collecting composite intervals.

Photo 2: Flags showing grid sample locations in DU1 (CSB South). Note this is where the vacuum truck was used to clean residual concentrate material along the edge of the foundation.

Photo 3: Flags marking approximate sample locations in DU2 (CSB Southeast). Note fill material is primarily rocks, significantly hindering sampling.

Photo 4: Flags marking grid sample locations in a portion of DU3 (CSB Northeast).

Photo 5: Flags marking grid sample locations in a portion of DU3 (CSB North).

Photo 6: Collecting 12-inch core samples at 1 ft., 2 ft., and 3 ft. off the wall.

Photo 7: Sieve used to remove larger particles from composite samples.

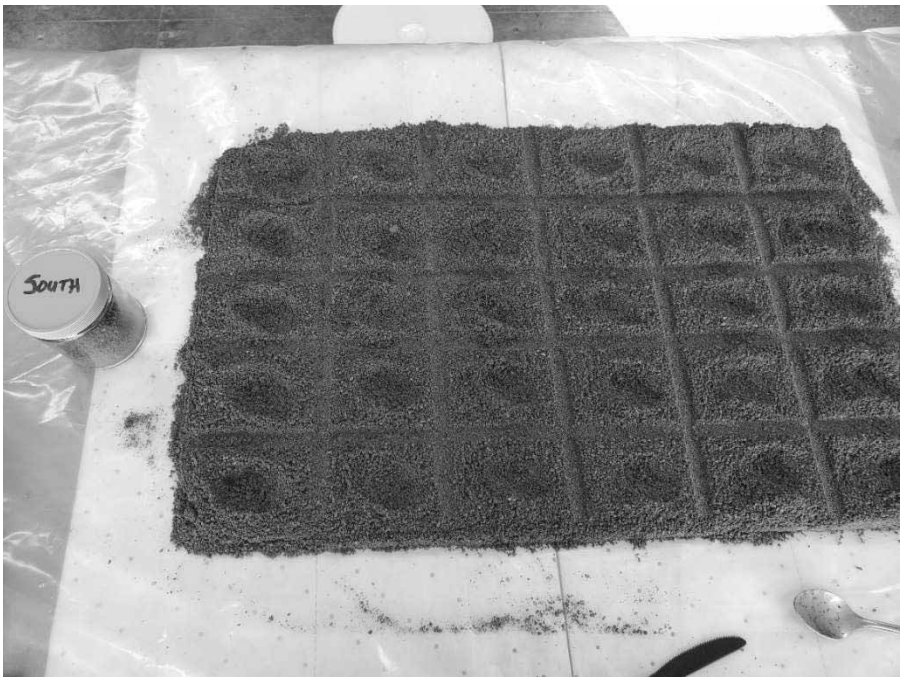

Photo 8: Sub-sampling of bulk composite from DU1 to prepare laboratory sample.

Photo 9: First round of excavation in DU3 (near the northeast corner of CSB). Note foam sealant at the base of metal siding.

Photo 10: First round of excavation in DU3 (CSB North). Large rocks were sorted and placed back in the trench.

Photo 11: Completed first round of excavation in DU3 (CSB North).

Photo 12: Completed first round of excavation in DU3 (CSB Northeast).

Photo 13: Sampling prior to the second round of excavation in DU3 (CSB North-middle).

Photo 14: Sampling prior to the second round of excavation in DU3 (CSB North-east).

Photo 15: The second round of excavation in DU3 (CSB North-East half).

Photo 16: The completed second round of excavation in DU3 (CSB North).

Photo 17: Container of soil from the second round of excavation in DU3. The material was shipped to a licensed hazardous waste disposal facility.

Photo 18: Additional excavation on the northeast side of CSB in May 2021.

Photo 19: Super sack of material excavated from the northeast side of CSB in May 2021.

Photo 20: DU2 following soil removal.

Attachment B

Laboratory Reports and LDRCs

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

September 17, 2020

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S20058
ACZ Project ID: L61369

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on September 10, 2020. This project has been assigned to ACZ's project number, L61369. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L61369. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after October 17, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NORTH

ACZ Sample ID: ***L61369-01***
Date Sampled: *09/06/20 15:00*
Date Received: *09/10/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6020B ICP-MS	1000	2160		*	mg/Kg	0.1	0.5	09/15/20 14:03	mfm
Zinc, total (3050)	M6020B ICP-MS	1000	1500		*	mg/Kg	6	20	09/15/20 14:03	mfm

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	83.7		*	%	0.1	0.5	09/10/20 20:18	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP-MS								09/11/20 11:30	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB SOUTH

ACZ Sample ID: ***L61369-02***
Date Sampled: *09/06/20 15:20*
Date Received: *09/10/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6020B ICP-MS	1000	427		*	mg/Kg	0.1	0.5	09/15/20 14:04	mfm
Zinc, total (3050)	M6020B ICP-MS	1000	3370		*	mg/Kg	6	20	09/15/20 14:04	mfm

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	89.1		*	%	0.1	0.5	09/11/20 4:26	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP-MS								09/11/20 12:30	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB SOUTHEAST

ACZ Sample ID: ***L61369-03***
Date Sampled: *09/06/20 15:40*
Date Received: *09/10/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6020B ICP-MS	1000	1450		*	mg/Kg	0.1	0.5	09/15/20 14:10	mfm
Zinc, total (3050)	M6020B ICP-MS	1000	2770		*	mg/Kg	6	20	09/15/20 14:10	mfm

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	77.8		*	%	0.1	0.5	09/11/20 8:30	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP-MS								09/11/20 15:30	krs

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company ACZ Project ID: ***L61369***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead, total (3050) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG505160													
WG505160ICV	ICV	09/15/20 13:21	MS200812-2	.05		.05023	mg/L	100	90	110			
WG505160ICB	ICB	09/15/20 13:23				U	mg/L		-0.0003	0.0003			
WG504817PBS	PBS	09/15/20 13:34				U	mg/Kg		-0.15	0.15			
WG504817LCSS	LCSS	09/15/20 13:36	PCN61790	92.3		91.05	mg/Kg		76.7	108			
WG504817LCSSD	LCSSD	09/15/20 13:38	PCN61790	92.3		88.32	mg/Kg		76.7	108	3	20	
WG504817LFB	LFB	09/15/20 13:39	MS200818-3	.05005		.05124	mg/Kg	102	80	120			
WG504817LFBD	LFBD	09/15/20 13:41	MS200818-3	.05005		.0553	mg/Kg	110	80	120	8	20	
WG504969PBS	PBS	09/15/20 13:57				U	mg/Kg		-0.15	0.15			
WG504969LCSS	LCSS	09/15/20 13:59	PCN61790	92.3		105.72	mg/Kg		76.7	108			
WG504969LCSSD	LCSSD	09/15/20 14:01	PCN61790	92.3		92.63	mg/Kg		76.7	108	13	20	
L61369-02MS	MS	09/15/20 14:06	MS200818-3	50.05	427	575.39	mg/Kg	296	75	125			M3
L61369-02MSD	MSD	09/15/20 14:08	MS200818-3	50.05	427	406.36	mg/Kg	-41	75	125	34	20	M3 RD

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG504941													
WG504941PBS	PBS	09/10/20 16:15				U	%		-0.1	0.1			
L61369-01DUP	DUP	09/11/20 0:22			83.7	84.18	%				1	20	

Zinc, total (3050) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG505160													
WG505160ICV	ICV	09/15/20 13:21	MS200812-2	.05		.0486	mg/L	97	90	110			
WG505160ICB	ICB	09/15/20 13:23				U	mg/L		-0.018	0.018			
WG504817PBS	PBS	09/15/20 13:34				U	mg/Kg		-9	9			
WG504817LCSS	LCSS	09/15/20 13:36	PCN61790	369		368	mg/Kg		298	440			
WG504817LCSSD	LCSSD	09/15/20 13:38	PCN61790	369		358	mg/Kg		298	440	3	20	
WG504817LFB	LFB	09/15/20 13:39	MS200818-3	.050075		.0508	mg/Kg	101	80	120			
WG504817LFBD	LFBD	09/15/20 13:41	MS200818-3	.050075		.0525	mg/Kg	105	80	120	3	20	
WG504969PBS	PBS	09/15/20 13:57				U	mg/Kg		-9	9			
WG504969LCSS	LCSS	09/15/20 13:59	PCN61790	369		433	mg/Kg		298	440			
WG504969LCSSD	LCSSD	09/15/20 14:01	PCN61790	369		377	mg/Kg		298	440	14	20	
L61369-02MS	MS	09/15/20 14:06	MS200818-3	50.075	3370	3602.8	mg/Kg	465	75	125			M3
L61369-02MSD	MSD	09/15/20 14:08	MS200818-3	50.075	3370	2770.2	mg/Kg	-1198	75	125	26	20	M3 RD

Hecla Greens Creek Mining Company ACZ Project ID: ***L61369***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L61369-01	WG505160	Lead, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Zinc, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
L61369-02	WG505160	Lead, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Zinc, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
L61369-03	WG505160	Lead, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Zinc, total (3050)	M6020B ICP-MS	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6020B ICP-MS	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6020B ICP-MS	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.

Hecla Greens Creek Mining Company ACZ Project ID: ***L61369***

Soil Analysis

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Solids, Percent	D2216-80

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L61369
Date Received: 09/10/2020 12:15
Received By:
Date Printed: 9/11/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA33589	5.9	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L61369
Date Received: 09/10/2020 12:15
Received By:
Date Printed: 9/11/2020

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L61369 Chain of Custod

ain of Custody Record / Analysis Request L61369

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **Miscellaneous**

Report To: gcenvdata@hecla-mining.com

Sampler: DL, GF

P.O.Number: S20058

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: 8 oz Glass	Total Lead	Total Zinc	pH < 2	RUSH (see below)
CSB North	9/6/2020	15:00	Soil	1	X	X		X
CSB South	9/6/2020	15:20	Soil	1	X	X		X
CSB Southeast	9/6/2020	15:40	Soil	1	X	X		X

Comments:

Please Rush

Deliverable Instructions:

Use naming system below for report. XXXX will be replaced by the lab Project ID

20200908_Miscellaneous_ACZ_XXXX

e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist

- ☐ Lab Contacted
- ☐ FedEx Pickup Scheduled
- ☐ _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Printed Name: David Landes	Printed Name:	Printed Name:	Printed Name:
Firm: HGCMC	Firm:	Firm:	Firm:
Date / Time: 9/9/20 09:00	Date / Time: 9/10/20 12:15	Date / Time:	Date / Time:

Condition of Sample Containers:

Temp Received: _____ °C

# of Coolers: _____

Seals Intact: _____

Page _____ of _____

L61369-2009171136

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L61369

Laboratory Report Date:

September 17, 2020

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L61369

Laboratory Report Date:

September 17, 2020

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented and within range

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☐ No☐ N/A☒ Comments:

Metals do not need preservative

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Spike recovery did not meet QC, RPD did not meet QC, ICP or ICP-MS Serial Dilution was not used because sample concentration was less than 50 times the MDL

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Recovery of the associate control sample was used instead of the Spike Recovery to meet QC Criteria, LC/LCSD RPD failed as the sample was non-homogenous, so data quality and usability are not affected.

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Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R did not meet QC as the analyte concentration is the sample is disproportionate to the spike level.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

All

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected as sample matrix caused the QC failure.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L61369

Laboratory Report Date:

September 17, 2020

CS Site Name:

Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

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Greens Creek Concentrate Building

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

L61369

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September 17, 2020

CS Site Name:

Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 13, 2020

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

cc: Cameron Sell

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S20058
ACZ Project ID: L61897

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 02, 2020. This project has been assigned to ACZ's project number, L61897. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L61897. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 12, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CBS NORTH - C1

ACZ Sample ID: ***L61897-01***
Date Sampled: *09/28/20 14:15*
Date Received: *10/02/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	109		*	mg/Kg	3.03	15.2	10/13/20 6:26	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	85.9		*	%	0.1	0.5	10/08/20 3:03	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/05/20 17:45	krs
Digestion - Hot Plate	M3050B ICP								10/08/20 14:21	krs/mlp
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/07/20 17:18	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CBS NORTH - C2

ACZ Sample ID: ***L61897-02***
Date Sampled: *09/28/20 14:18*
Date Received: *10/02/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	253		*	mg/Kg	3	15	10/13/20 6:46	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	85.9		*	%	0.1	0.5	10/08/20 4:03	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/05/20 17:55	krs
Digestion - Hot Plate	M3050B ICP								10/08/20 15:22	krs/mlp
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/07/20 17:22	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CBS NORTH - C3

ACZ Sample ID: ***L61897-03***
Date Sampled: *09/28/20 14:21*
Date Received: *10/02/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	200	5240		*	mg/Kg	6	30	10/13/20 6:50	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	89.8		*	%	0.1	0.5	10/08/20 5:03	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/05/20 18:05	krs
Digestion - Hot Plate	M3050B ICP								10/08/20 16:23	krs/mlp
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/07/20 17:26	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CBS NORTH - C4

ACZ Sample ID: ***L61897-04***
Date Sampled: *09/28/20 14:25*
Date Received: *10/02/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	2190		*	mg/Kg	3.03	15.2	10/13/20 6:53	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	86.6		*	%	0.1	0.5	10/08/20 6:04	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/05/20 18:15	krs
Digestion - Hot Plate	M3050B ICP								10/08/20 16:44	krs/mlp
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/07/20 17:30	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CBS NORTH - W COMP

ACZ Sample ID: ***L61897-05***
Date Sampled: *09/28/20 14:30*
Date Received: *10/02/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/09/20 15:24	jlw

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead (TCLP)	M6010D ICP	1	43100		*	ug/L	30	150	10/12/20 22:07	kja

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/07/20 7:53	mlp

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company ACZ Project ID: ***L61897***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507084													
WG507084ICV	ICV	10/12/20 21:15	II201009-1	4		3.887	mg/L	97	90	110			
WG507084ICB	ICB	10/12/20 21:19				U	mg/L		-0.09	0.09			
WG506692PBS	PBS	10/12/20 21:43				U	mg/L		-0.09	0.09			
WG506692LFB	LFB	10/12/20 21:47	IITCLPSPIKE	1.001		1.006	mg/L	100	80	120			
L61895-01MS	MS	10/12/20 21:55	IITCLPSPIKE	1.001	U	.986	mg/L	99	75	125			
L61895-01MSD	MSD	10/12/20 21:59	IITCLPSPIKE	1.001	U	.999	mg/L	100	75	125	1	20	
L61895-01DUP	DUP	10/12/20 22:03			U	U	mg/L				0	20	RA

Lead, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507078													
WG507078ICV	ICV	10/13/20 4:41	II201009-1	4		3.885	mg/L	97	90	110			
WG507078ICB	ICB	10/13/20 4:45				U	mg/L		-0.09	0.09			
WG506815PBS	PBS	10/13/20 5:09				U	mg/Kg		-9	9			
WG506815LCSS	LCSS	10/13/20 5:13	PCN61789	92.3		86.23	mg/Kg		76.7	108			
WG506815LCSSD	LCSSD	10/13/20 5:17	PCN61789	92.3		80.77	mg/Kg		76.7	108	7	20	
L61897-01MS	MS	10/13/20 6:30	II201002-6	100.14	109	276.3	mg/Kg	167	75	125			MC
L61897-01MSD	MSD	10/13/20 6:42	II201002-6	101.1414	109	184.022	mg/Kg	74	75	125	40	20	MC RD

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG506792													
L61929-01DUP	DUP	10/08/20 8:04			18	17.83	%				1	20	
WG506792PBS	PBS	10/08/20 10:05				U	%		-0.1	0.1			

Hecla Greens Creek Mining Company ACZ Project ID: ***L61897***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L61897-01	WG507078	Lead, total (3050)	M6010D ICP	MC	Recovery for matrix spike and matrix spike duplicate are outside of acceptance limits; recovery for the method control sample was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L61897-02	WG507078	Lead, total (3050)	M6010D ICP	MC	Recovery for matrix spike and matrix spike duplicate are outside of acceptance limits; recovery for the method control sample was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L61897-03	WG507078	Lead, total (3050)	M6010D ICP	MC	Recovery for matrix spike and matrix spike duplicate are outside of acceptance limits; recovery for the method control sample was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L61897-04	WG507078	Lead, total (3050)	M6010D ICP	MC	Recovery for matrix spike and matrix spike duplicate are outside of acceptance limits; recovery for the method control sample was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L61897-05	WG507084	Lead (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

Hecla Greens Creek Mining Company ACZ Project ID: ***L61897***

Soil Analysis

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Solids, Percent	D2216-80

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L61897
Date Received: 10/02/2020 12:30
Received By:
Date Printed: 10/5/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA33775	9.8	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L61897
Date Received: 10/02/2020 12:30
Received By:
Date Printed: 10/5/2020

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L61897-20101317

L61897 Chain of Custod

Hecla — dy Record / Analysis Request L61897

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **Miscellaneous**

Report To: gcenvdata@hecla-mining.com

Sampler: DL

P.O.Number: S20058

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: 8 oz Clear Glass	Total Lead (Pb)	TCLP - Lead (Pb)	pH < 2	RUSH (see below)
CSB North - C1	9/28/2020	1415	Soil	1	X			X
CSB North - C2	9/28/2020	1418	Soil	1	X			X
CSB North - C3	9/28/2020	1421	Soil	1	X			X
CSB North - C4	9/28/2020	1425	Soil	1	X			X
CSB North - W Comp	9/28/2020	1430	Soil	1		X		X

Comments:

Please Rush

Deliverable Instructions:

Use naming system below for report. XXXX will be replaced by the lab Project ID

20200928_Miscellaneous_ACZ_XXXX

e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist

- [x] Lab Contacted
- [x] FedEx Pickup Scheduled
- [ ] _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature: David Landes	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: David Landes	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date / Time: 9/28/20 16:00	Date / Time: 10/2/20 12:30	Date / Time:	Date / Time:	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☐ No☐ N/A☒ Comments:

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Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

MS/MSD outside of QC Limits, MS/MSD RPD outside QC Criteria for all samples

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Recovery for the method control sample can be used instead, MS/MSD RPD QC failure due to non-homogenous nature of sample matrix

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

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Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☒ N/A☐ Comments:

TCLP results are reported as mg/L

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

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Laboratory Report Date:

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CS Site Name:

Greens Creek Concentrate Building

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R did not meet QC

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

MS/MSD was not within QC Criteria due to non-homogeneity of sample matrix

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

All

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected as sample matrix caused the RPD QC failure and the %R of the control sample was acceptable.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

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Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

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iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

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Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Hazard Identification Number:

L621897

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

Metals do not require preservation

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☐ No☐ N/A☒ Comments:

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Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

MS/MSD outside of QC Limits, MS/MSD RPD outside QC Criteria for all samples

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Recovery for the method control sample can be used instead, MS/MSD RPD QC failure due to non-homogenous nature of sample matrix

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

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b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☒ N/A☐ Comments:

TCLP results are reported as mg/L

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

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Greens Creek Concentrate Building

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

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Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R did not meet QC

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

MS/MSD was not within QC Criteria due to non-homogeneity of sample matrix

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

All

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected as sample matrix caused the RPD QC failure and the %R of the control sample was acceptable.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

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Greens Creek Concentrate Building

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

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October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

November 06, 2020

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S20058
ACZ Project ID: L62081

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 09, 2020. This project has been assigned to ACZ's project number, L62081. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L62081. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after December 06, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NE-C1

ACZ Sample ID: ***L62081-01***
Date Sampled: *10/05/20 16:00*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	247			mg/Kg	3.03	15.2	11/04/20 6:01	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	86.4		*	%	0.1	0.5	10/21/20 2:22	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/20/20 15:30	krs
Digestion - Hot Plate	M3050B ICP								10/31/20 11:53	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/30/20 15:00	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NE-C2

ACZ Sample ID: ***L62081-02***
Date Sampled: *10/05/20 16:05*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	744			mg/Kg	3	15	11/04/20 6:13	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	85.7		*	%	0.1	0.5	10/21/20 3:26	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/20/20 15:45	krs
Digestion - Hot Plate	M3050B ICP								10/31/20 12:35	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/30/20 15:05	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NE-C3

ACZ Sample ID: ***L62081-03***
Date Sampled: *10/05/20 16:10*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	1430			mg/Kg	3	15	11/04/20 6:17	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	82.6		*	%	0.1	0.5	10/21/20 4:31	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/20/20 16:00	krs
Digestion - Hot Plate	M3050B ICP								10/31/20 13:17	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/30/20 15:10	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB SE-C1

ACZ Sample ID: ***L62081-04***
Date Sampled: *10/05/20 16:15*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	633			mg/Kg	3.03	15.2	11/04/20 6:20	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	82.8		*	%	0.1	0.5	10/21/20 5:36	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/20/20 16:15	krs
Digestion - Hot Plate	M3050B ICP								10/31/20 13:31	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/30/20 15:15	krs

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB SE-C2

ACZ Sample ID: ***L62081-05***
Date Sampled: *10/05/20 16:20*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	1080			mg/Kg	3.03	15.2	11/04/20 6:31	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	79.8		*	%	0.1	0.5	10/21/20 6:41	krs

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				10/20/20 16:30	krs
Digestion - Hot Plate	M3050B ICP								10/31/20 13:45	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2				*				10/30/20 15:20	krs

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company

ACZ Project ID: ***L62081***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508720													
WG508720ICV	ICV	11/04/20 4:34	II201023-2	4		4.009	mg/L	100	90	110			
WG508720ICB	ICB	11/04/20 4:38				U	mg/L		-0.09	0.09			
WG508608PBS	PBS	11/04/20 5:01				U	mg/Kg		-9	9			
WG508608LCSS1	LCSS	11/04/20 5:05	PCN61045	105		112.8	mg/Kg		86.7	123			
WG508608LCSSD1	LCSSD	11/04/20 5:09	PCN61045	105		113.5	mg/Kg		86.7	123	1	20	
L62081-01MS	MS	11/04/20 6:05	II201027-3	101.1414	247	355.52	mg/Kg	107	75	125			
L62081-01MSD	MSD	11/04/20 6:09	II201027-3	100.14	247	371.4	mg/Kg	124	75	125	4	20	

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507734													
WG507734PBS	PBS	10/20/20 14:30				U	%		-0.1	0.1			
L61933-01DUP	DUP	10/20/20 16:39			34	34.56	%				2	20	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L62081***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

Hecla Greens Creek Mining Company ACZ Project ID: ***L62081***

Soil Analysis

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Solids, Percent	D2216-80

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L62081
Date Received: 10/09/2020 10:52
Received By:
Date Printed: 10/12/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
6330	2.7	NA	15	Yes

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L62081
Date Received: 10/09/2020 10:52
Received By:
Date Printed: 10/12/2020

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L62081-2011060906

L62081 Chain of Custod

ain of Custody Record / Analysis Request L62081

Lab Sent To:

ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **CSB**

Report To: gcenvdata@hecla-mining.com

Sampler: GF

P.O.Number: S20058

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: 8oz Clear Glass						Total Lead (Pb)									pH < 2	RUSH (see below)
CSB NE-C1	10/5/2020	1600	Soil	X						X										
CSB NE-C2	10/5/2020	1605	Soil	X						X										
CSB NE-C3	10/5/2020	1610	Soil	X						X										
CSB SE-C1	10/5/2020	1615	Soil	X						X										
CSB SE-C2	10/5/2020	1620	Soil	X						X										

Comments:

Deliverable Instructions:
Use naming system below for report. XXXX will be replaced by the lab Project ID
20201006_CSB_ACZ_XXXX
e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist
☐ Lab Contacted
☐ FedEx Pickup Scheduled
☐ _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature:	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: G. FREDHEIM	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date / Time: 10-6-20 16:00	Date / Time: 10/9/20 10:52	Date / Time:	Date / Time:	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☐ No☐ N/A☒ Comments:

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

MS/MSD outside of QC Limits, MS/MSD RPD outside QC Criteria for all samples

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Recovery for the method control sample can be used instead, MS/MSD RPD QC failure due to non-homogenous nature of sample matrix

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☒ N/A☐ Comments:

TCLP results are reported as mg/L

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

L62081

Laboratory Report Date:

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Greens Creek Concentrate Building

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R did not meet QC

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

MS/MSD was not within QC Criteria due to non-homogeneity of sample matrix

L62081

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Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

All

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected as sample matrix caused the RPD QC failure and the %R of the control sample was acceptable.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L62081

Laboratory Report Date:

October 13, 2020

CS Site Name:

Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

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Greens Creek Concentrate Building

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

L62081

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Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 28, 2020

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S20058
ACZ Project ID: L62075

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 09, 2020. This project has been assigned to ACZ's project number, L62075. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L62075. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 27, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Case Narrative

Hecla Greens Creek Mining Company

October 28, 2020

Project ID: S20058
ACZ Project ID: L62075

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 3 miscellaneous samples from Hecla Greens Creek Mining Company on October 9, 2020. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L62075. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Holding Times

All analyses were performed within EPA recommended holding times.

Sample Analysis

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports.

This project was revised on 10/28/2020 to report additional TCLP RCRA metals for L62075-02. No other changes were made.

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: TCLP NORTH

ACZ Sample ID: ***L62075-01***
Date Sampled: *10/05/20 16:25*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/16/20 11:15	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead (TCLP)	M6010D ICP	2	54300		*	ug/L	60	300	10/23/20 0:31	kja

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/14/20 23:16	mlp

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: TCLP NE

ACZ Sample ID: ***L62075-02***
Date Sampled: *10/05/20 16:30*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/16/20 13:48	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic (TCLP)	M6010D ICP	1	<40	U	*	ug/L	40	200	10/21/20 6:34	jlw
Barium (TCLP)	M6010D ICP	1	946			ug/L	7	35	10/21/20 6:34	jlw
Cadmium (TCLP)	M6010D ICP	1	105		*	ug/L	8	25	10/21/20 6:34	jlw
Chromium (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	50	10/21/20 6:34	jlw
Lead (TCLP)	M6010D ICP	1	7780		*	ug/L	30	150	10/21/20 6:34	jlw
Mercury (TCLP)	M7470A CVAA	1	<0.2	U	*	ug/L	0.2	1	10/28/20 14:08	llr
Selenium (TCLP)	M6010D ICP	1	<50	U	*	ug/L	50	250	10/21/20 6:34	jlw
Silver (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	25	10/21/20 6:34	jlw

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/15/20 8:33	mlp

Arizona license number: AZ0102

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: TCLP SE

ACZ Sample ID: ***L62075-03***
Date Sampled: *10/05/20 16:35*
Date Received: *10/09/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/16/20 14:39	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead (TCLP)	M6010D ICP	1	2500		*	ug/L	30	150	10/21/20 6:42	jlw

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/15/20 11:39	mlp

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company ACZ Project ID: ***L62075***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Arsenic (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	4		3.984	mg/L	100	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.12	0.12			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.12	0.12			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	1.001		1.095	mg/L	109	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	1.001	U	1.071	mg/L	107	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	1.001	U	1.096	mg/L	109	75	125	2	20	
L62075-03DUP	DUP	10/21/20 6:46			U	U	mg/L				0	20	RA

Barium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	2		1.984	mg/L	99	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.021	0.021			
WG507291PBS	PBS	10/21/20 6:15				.0147	mg/L		-0.021	0.021			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	20.5		20.3	mg/L	99	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	20.5	.909	21.05	mg/L	98	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	20.5	.909	21.05	mg/L	98	75	125	0	20	
L62075-03DUP	DUP	10/21/20 6:46			1.25	1.244	mg/L				0	20	

Cadmium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	2		1.927	mg/L	96	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.024	0.024			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.024	0.024			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	.501		.5021	mg/L	100	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	.501	.0979	.5862	mg/L	97	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	.501	.0979	.5926	mg/L	99	75	125	1	20	
L62075-03DUP	DUP	10/21/20 6:46			.0365	.0353	mg/L				3	20	RA

Chromium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	2		1.988	mg/L	99	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.03	0.03			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.03	0.03			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	.501		.517	mg/L	103	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	.501	U	.506	mg/L	101	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	.501	U	.514	mg/L	103	75	125	2	20	
L62075-03DUP	DUP	10/21/20 6:46			U	U	mg/L				0	20	RA

Hecla Greens Creek Mining Company ACZ Project ID: ***L62075***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	4		3.907	mg/L	98	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.09	0.09			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.09	0.09			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	1.001		1.021	mg/L	102	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	1.001	50.1	50.29	mg/L	19	75	125			M3
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	1.001	50.1	50.39	mg/L	29	75	125	0	20	M3
L62075-03DUP	DUP	10/21/20 6:46			2.5	3.083	mg/L				21	20	RD
WG507797													
WG507797ICV	ICV	10/22/20 23:56	II201009-1	4		3.937	mg/L	98	90	110			
WG507797ICB	ICB	10/23/20 0:00				U	mg/L		-0.09	0.09			
WG507291PBS	PBS	10/23/20 0:23				U	mg/L		-0.09	0.09			
WG507291LFB	LFB	10/23/20 0:27	IITCLPSPIKE	1.001		1.078	mg/L	108	80	120			
L62075-01MS	MS	10/23/20 0:35	IITCLPSPIKE	1.001	54.3	54.92	mg/L	62	75	125			M3
L62075-01MSD	MSD	10/23/20 0:39	IITCLPSPIKE	1.001	54.3	53.28	mg/L	-102	75	125	3	20	M3
L62075-03DUP	DUP	10/23/20 0:51			2.61	3.255	mg/L				22	20	RD

Mercury (TCLP) M7470A CVAA

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508289													
WG508289ICV	ICV	10/28/20 14:00	HG200810-2	.005		.00482	mg/L	96	90	110			
WG508289ICB	ICB	10/28/20 14:01				U	mg/L		-0.0006	0.0006			
WG508289PBW	PBW	10/28/20 14:03				U	mg/L		-0.00044	0.00044			
WG507291PBS	PBS	10/28/20 14:04				U	mg/L		-0.0006	0.0006			
WG507291LFB	LFB	10/28/20 14:05	HG201027-4	.002002		.00193	mg/L	96	85	115			
L62075-01MS	MS	10/28/20 14:06	HG201027-4	.002002	U	.00203	mg/L	101	85	115			
L62075-01MSD	MSD	10/28/20 14:07	HG201027-4	.002002	U	.00196	mg/L	98	85	115	4	20	
L62075-03DUP	DUP	10/28/20 14:10			U	U	mg/L				0	20	RA
WG507968PBS	PBS	10/28/20 14:13				U	mg/L		-0.0006	0.0006			
WG507968LFB	LFB	10/28/20 14:14	HG201027-4	.002002		.00198	mg/L	99	85	115			

Selenium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	4		3.997	mg/L	100	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.15	0.15			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.15	0.15			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	1.001		1.09	mg/L	109	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	1.001	U	1.054	mg/L	105	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	1.001	U	1.062	mg/L	106	75	125	1	20	
L62075-03DUP	DUP	10/21/20 6:46			U	U	mg/L				0	20	RA

Hecla Greens Creek Mining Company

ACZ Project ID: ***L62075***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Silver (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG507722													
WG507722ICV	ICV	10/21/20 5:48	II201009-1	1		1.006	mg/L	101	90	110			
WG507722ICB	ICB	10/21/20 5:51				U	mg/L		-0.03	0.03			
WG507291PBS	PBS	10/21/20 6:15				U	mg/L		-0.03	0.03			
WG507291LFB	LFB	10/21/20 6:19	IITCLPSPIKE	.501		.493	mg/L	98	80	120			
L62075-01MS	MS	10/21/20 6:26	IITCLPSPIKE	.501	U	.493	mg/L	98	75	125			
L62075-01MSD	MSD	10/21/20 6:30	IITCLPSPIKE	.501	U	.499	mg/L	100	75	125	1	20	
L62075-03DUP	DUP	10/21/20 6:46			U	U	mg/L				0	20	RA

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L62075***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L62075-01	WG507797	Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L62075-02	WG507722	Arsenic (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Cadmium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Chromium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
	WG508289	Mercury (TCLP)	M7470A CVAA	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG507722	Selenium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Silver (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L62075-03	WG507722	Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.

Certification Qualifiers

Hecla Greens Creek Mining Company ACZ Project ID: ***L62075***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L62075
Date Received: 10/09/2020 10:52
Received By:
Date Printed: 10/12/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
6330	2.7	NA	15	Yes

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID:	L62075
Date Received:	10/09/2020 10:52
Received By:	
Date Printed:	10/12/2020

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L62075-2010281559

L62075 Chain of Custod

Chain of Custody Record / Analysis Request L62075

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **TCLP**

Report To: gcenvdata@hecla-mining.com

Sampler: GF

P.O.Number: S20058

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: 8oz Glass Jar	TCLP-RCRA Metals (8)	TPH - DRO/RRO	TCLP - LEAD	TCLP-RCRA VOCs	TCLP-RCRA Semi-VOCs	TCLP-RCRA Pesticides/Herbicides	TCLP-RCRA Ignitability	TCLP-RCRA Corrosivity	TCLP-RCRA Reactivity	pH < 2	RUSH (see below)
TCLP NORTH	10/5/2020	16:25	Soil	1			X								
TCLP NE	10/5/2020	16:30	Soil	1			X								
TCLP SE	10/5/2020	16:35	Soil	1			X								

Comments:

Deliverable Instructions:
Use naming system below for report. XXXX will be replaced by the lab Project ID
20201006-TCLP-ACZ-XXXX
e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist
- ☐ Lab Contacted
- ☐ FedEx Pickup Scheduled
- ☐ _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature:	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: G. FREDHEIM	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date / Time: 10-6-20 16:00	Date / Time: 10/6/20 10:52	Date / Time:	Date / Time:	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L62075

Laboratory Report Date:

October 28, 2020

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L62075

Laboratory Report Date:

October 28, 2020

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

L62075

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Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

MS %R outside of QC Criteria, MS/MSD RPD does not meet QC,

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Recovery for the LCS can be used instead, MS/MSD RPD QC failure due to non-homogenous nature of sample matrix, therefore data quality and usability are not affected

L62075

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CS Site Name:

Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☒ N/A☐ Comments:

TCLP results are reported as mg/L

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

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iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R did not meet QC

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

MS/MSD was not within QC Criteria due to non-homogeneity of sample matrix

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

All

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected as sample matrix caused the RPD QC failure and the %R of the LCS was acceptable.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L62075

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Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

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iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

L62075

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CS Site Name:

Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Revised Analytical Report

October 30, 2020

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S20058
ACZ Project ID: L62358

gcenvdata@hecla-mining.com:

Enclosed are revised analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 21, 2020 and originally reported on October 29, 2020. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L62358. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L62358. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 28, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Case Narrative

Hecla Greens Creek Mining Company

October 30, 2020

Project ID: S20058
ACZ Project ID: L62358

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 5 miscellaneous samples from Hecla Greens Creek Mining Company on October 21, 2020. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L62358. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Holding Times

All analyses were performed within EPA recommended holding times.

Sample Analysis

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports.

This project was revised on 10/30/2020 to report the correct analyses for samples L62358-04 and -05. No other changes were made.

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NORTH RD2

ACZ Sample ID: ***L62358-01***
Date Sampled: *10/17/20 14:00*
Date Received: *10/21/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/26/20 13:01	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic (TCLP)	M6010D ICP	1	<40	U	*	ug/L	40	200	10/27/20 20:55	kja
Barium (TCLP)	M6010D ICP	1	807			ug/L	7	35	10/27/20 20:55	kja
Cadmium (TCLP)	M6010D ICP	1	32.1		*	ug/L	8	25	10/27/20 20:55	kja
Chromium (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	50	10/27/20 20:55	kja
Lead (TCLP)	M6010D ICP	1	43600		*	ug/L	30	150	10/27/20 20:55	kja
Mercury (TCLP)	M7470A CVAA	1	<0.2	U	*	ug/L	0.2	1	10/28/20 14:15	llr
Selenium (TCLP)	M6010D ICP	1	<50	U	*	ug/L	50	250	10/27/20 20:55	kja
Silver (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	25	10/27/20 20:55	kja

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/23/20 0:08	mlp

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NORTH RD1 E

ACZ Sample ID: ***L62358-02***
Date Sampled: *10/17/20 15:30*
Date Received: *10/21/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/26/20 14:40	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic (TCLP)	M6010D ICP	1	<40	U	*	ug/L	40	200	10/27/20 21:07	kja
Barium (TCLP)	M6010D ICP	1	842			ug/L	7	35	10/27/20 21:07	kja
Cadmium (TCLP)	M6010D ICP	1	66.1		*	ug/L	8	25	10/27/20 21:07	kja
Chromium (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	50	10/27/20 21:07	kja
Lead (TCLP)	M6010D ICP	1	23400		*	ug/L	30	150	10/27/20 21:07	kja
Mercury (TCLP)	M7470A CVAA	1	<0.2	U	*	ug/L	0.2	1	10/26/20 14:45	llr
Selenium (TCLP)	M6010D ICP	1	<50	U	*	ug/L	50	250	10/27/20 21:07	kja
Silver (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	25	10/27/20 21:07	kja

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/23/20 6:59	mlp

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB NORTH RD1 W

ACZ Sample ID: ***L62358-03***
Date Sampled: *10/17/20 15:45*
Date Received: *10/21/20*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								10/26/20 15:46	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic (TCLP)	M6010D ICP	1	<40	U	*	ug/L	40	200	10/27/20 21:23	kja
Barium (TCLP)	M6010D ICP	1	679			ug/L	7	35	10/27/20 21:23	kja
Cadmium (TCLP)	M6010D ICP	1	149		*	ug/L	8	25	10/27/20 21:23	kja
Chromium (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	50	10/27/20 21:23	kja
Lead (TCLP)	M6010D ICP	1	37300		*	ug/L	30	150	10/27/20 21:23	kja
Mercury (TCLP)	M7470A CVAA	1	<0.2	U	*	ug/L	0.2	1	10/26/20 14:36	llr
Selenium (TCLP)	M6010D ICP	1	<50	U	*	ug/L	50	250	10/27/20 21:23	kja
Silver (TCLP)	M6010D ICP	1	<10	U	*	ug/L	10	25	10/27/20 21:23	kja

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								10/23/20 11:33	mlp

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB-N-RD2-C1

ACZ Sample ID: ***L62358-04***
Date Sampled: *10/17/20 16:40*
Date Received: *10/21/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	342		*	mg/Kg	3.03	15.2	10/29/20 10:46	kja
Zinc, total (3050)	M6010D ICP	101	285		*	mg/Kg	2.02	5.05	10/29/20 10:46	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	88.3		*	%	0.1	0.5	10/26/20 15:30	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								10/26/20 15:15	jms
Digestion - Hot Plate	M3050B ICP								10/27/20 14:57	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								10/27/20 9:10	krs

Hecla Greens Creek Mining Company
Project ID: S20058
Sample ID: CSB-N-RD2-C2

ACZ Sample ID: ***L62358-05***
Date Sampled: *10/17/20 16:50*
Date Received: *10/21/20*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	102	117		*	mg/Kg	3.06	15.3	10/29/20 10:49	kja
Zinc, total (3050)	M6010D ICP	102	148		*	mg/Kg	2.04	5.1	10/29/20 10:49	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	87.2		*	%	0.1	0.5	10/27/20 7:16	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								10/26/20 15:30	jms
Digestion - Hot Plate	M3050B ICP								10/27/20 15:18	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								10/27/20 9:20	krs

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Arsenic (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	4		3.94	mg/L	99	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.12	0.12			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.12	0.12			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	1.001		1.007	mg/L	101	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	1.001	U	1.033	mg/L	103	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	1.001	U	1.036	mg/L	103	75	125	0	20	
L62358-02DUP	DUP	10/27/20 21:11			U	U	mg/L				0	20	RA

Barium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	2		1.96	mg/L	98	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.021	0.021			
WG507968PBS	PBS	10/27/20 20:35				.0157	mg/L		-0.021	0.021			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	20.5		19.63	mg/L	96	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	20.5	.807	20.7	mg/L	97	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	20.5	.807	20.74	mg/L	97	75	125	0	20	
L62358-02DUP	DUP	10/27/20 21:11			.842	.82	mg/L				3	20	

Cadmium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	2		1.89	mg/L	95	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.024	0.024			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.024	0.024			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	.501		.4737	mg/L	95	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	.501	.0321	.5063	mg/L	95	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	.501	.0321	.5175	mg/L	97	75	125	2	20	
L62358-02DUP	DUP	10/27/20 21:11			.0661	.0686	mg/L				4	20	RA

Chromium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	2		1.913	mg/L	96	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.03	0.03			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.03	0.03			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	.501		.476	mg/L	95	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	.501	U	.478	mg/L	95	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	.501	U	.482	mg/L	96	75	125	1	20	
L62358-02DUP	DUP	10/27/20 21:11			U	U	mg/L				0	20	RA

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	4		3.823	mg/L	96	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.09	0.09			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.09	0.09			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	1.001		.961	mg/L	96	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	1.001	43.6	43.96	mg/L	36	75	125			M3
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	1.001	43.6	43.61	mg/L	1	75	125	1	20	M3
L62358-02DUP	DUP	10/27/20 21:11			23.4	23.5	mg/L				0	20	

Lead, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508365													
WG508365ICV	ICV	10/29/20 9:11	II201023-2	4		3.809	mg/L	95	90	110			
WG508365ICB	ICB	10/29/20 9:15				U	mg/L		-0.09	0.09			
WG508204PBS	PBS	10/29/20 9:38				U	mg/Kg		-9	9			
WG508204LCSS	LCSS	10/29/20 9:42	PCN61045	105		102.8	mg/Kg		86.7	123			
WG508204LCSSD	LCSSD	10/29/20 9:46	PCN61045	105		109.098	mg/Kg		86.7	123	6	20	
L62358-05MS	MS	10/29/20 10:53	II201015-4	101.1414	117	198.061	mg/Kg	80	75	125			
L62358-05MSD	MSD	10/29/20 10:57	II201015-4	102.1428	117	263.568	mg/Kg	143	75	125	28	20	M1 RD

Mercury (TCLP) M7470A CVAA

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508043													
WG508043ICV1	ICV	10/26/20 10:39	HG200810-2	.005		.00486	mg/L	97	95	105			
WG508043ICB	ICB	10/26/20 10:40				U	mg/L		-0.0002	0.0002			
WG508098													
WG508098PBW	PBW	10/26/20 14:15				U	mg/L		-0.00044	0.00044			
WG507968PBS	PBS	10/26/20 14:16				U	mg/L		-0.0006	0.0006			
WG507968LFB	LFB	10/26/20 14:17	HG201009-6	.002002		.00176	mg/L	88	85	115			
L62358-01MS	MS	10/26/20 14:43	HG201009-6	.002002	.00142	.00205	mg/L	31	85	115			M2
L62358-01MSD	MSD	10/26/20 14:44	HG201009-6	.002002	.00142	.00196	mg/L	27	85	115	4	20	M2
WG508289													
WG508289ICV	ICV	10/28/20 14:00	HG200810-2	.005		.00482	mg/L	96	90	110			
WG508289ICB	ICB	10/28/20 14:01				U	mg/L		-0.0006	0.0006			
WG508289PBW	PBW	10/28/20 14:03				U	mg/L		-0.00044	0.00044			
WG507291PBS	PBS	10/28/20 14:04				U	mg/L		-0.0006	0.0006			
WG507291LFB	LFB	10/28/20 14:05	HG201027-4	.002002		.00193	mg/L	96	85	115			
WG507968PBS	PBS	10/28/20 14:13				U	mg/L		-0.0006	0.0006			
WG507968LFB	LFB	10/28/20 14:14	HG201027-4	.002002		.00198	mg/L	99	85	115			
L62358-01MS	MS	10/28/20 14:16	HG201027-4	.002002	U	.00206	mg/L	103	85	115			
L62358-01MSD	MSD	10/28/20 14:17	HG201027-4	.002002	U	.00213	mg/L	106	85	115	3	20	
L62358-02DUP	DUP	10/28/20 14:19			U	U	mg/L				0	20	RA

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Selenium (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	4		3.871	mg/L	97	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.15	0.15			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.15	0.15			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	1.001		.975	mg/L	97	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	1.001	U	1	mg/L	100	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	1.001	U	1.02	mg/L	102	75	125	2	20	
L62358-02DUP	DUP	10/27/20 21:11			U	U	mg/L				0	20	RA

Silver (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	1		.999	mg/L	100	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.03	0.03			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.03	0.03			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	.501		.472	mg/L	94	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	.501	U	.476	mg/L	95	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	.501	U	.475	mg/L	95	75	125	0	20	
L62358-02DUP	DUP	10/27/20 21:11			U	U	mg/L				0	20	RA

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508171													
L62358-04DUP	DUP	10/26/20 23:23			88.3	88.52	%				0	20	
WG508171PBS	PBS	10/27/20 15:10				U	%		-0.1	0.1			

Zinc (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508223													
WG508223ICV	ICV	10/27/20 20:07	II201023-2	2		1.938	mg/L	97	90	110			
WG508223ICB	ICB	10/27/20 20:11				U	mg/L		-0.06	0.06			
WG507968PBS	PBS	10/27/20 20:35				U	mg/L		-0.06	0.06			
WG507968LFB	LFB	10/27/20 20:39	IITCLPSPIKE	.5005		.515	mg/L	103	80	120			
L62358-01MS	MS	10/27/20 20:59	IITCLPSPIKE	.5005	4.41	4.877	mg/L	93	75	125			
L62358-01MSD	MSD	10/27/20 21:03	IITCLPSPIKE	.5005	4.41	4.824	mg/L	83	75	125	1	20	
L62358-02DUP	DUP	10/27/20 21:11			9.6	15.62	mg/L				49	20	RD

Zinc, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG508365													
WG508365ICV	ICV	10/29/20 9:11	II201023-2	2		1.944	mg/L	97	90	110			
WG508365ICB	ICB	10/29/20 9:15				U	mg/L		-0.06	0.06			
WG508204PBS	PBS	10/29/20 9:38				U	mg/Kg		-6	6			
WG508204LCSS	LCSS	10/29/20 9:42	PCN61045	212		216.6	mg/Kg		171	252			
WG508204LCSSD	LCSSD	10/29/20 9:46	PCN61045	212		222.849	mg/Kg		171	252	3	20	
L62358-05MS	MS	10/29/20 10:53	II201015-4	50.57575	148	187.052	mg/Kg	77	75	125			
L62358-05MSD	MSD	10/29/20 10:57	II201015-4	51.0765	148	220.626	mg/Kg	142	75	125	16	20	MA

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L62358-01	WG508223	Arsenic (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Cadmium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Chromium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG508289	Mercury (TCLP)	M7470A CVAA	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG508223	Selenium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Silver (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L62358-02	WG508223	Arsenic (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Cadmium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Chromium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG508098	Mercury (TCLP)	M7470A CVAA	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7470A CVAA	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG508223	Selenium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Silver (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L62358-03	WG508223	Arsenic (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Cadmium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Chromium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Lead (TCLP)	M6010D ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG508098	Mercury (TCLP)	M7470A CVAA	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7470A CVAA	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG508223	Selenium (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
		Silver (TCLP)	M6010D ICP	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L62358-04	WG508365	Lead, total (3050)	M6010D ICP	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
		Zinc, total (3050)	M6010D ICP	MA	Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits.
			M6010D ICP	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
L62358-05	WG508365	Lead, total (3050)	M6010D ICP	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
		Zinc, total (3050)	M6010D ICP	MA	Recovery for either the spike or spike duplicate was outside of the acceptance limits; the RPD was within the acceptance limits.
			M6010D ICP	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.

Hecla Greens Creek Mining Company ACZ Project ID: ***L62358***

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L62358
Date Received: 10/21/2020 10:44
Received By:
Date Printed: 10/22/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?		X	
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
6211	2.1	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S20058

ACZ Project ID: L62358
Date Received: 10/21/2020 10:44
Received By:
Date Printed: 10/22/2020

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L62358-2010301428

L62358 Chain of Custody Record / Analysis Request L62358

Hecla

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **Miscellaneous**

Report To: gcenvdata@hecla-mining.com

Sampler: DL, DM

P.O.Number: S20058

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: Plastic Bag							TCLP - RCRA Metals (8)	Total Lead (Pb)	Total Zinc (Zn)							pH < 2	RUSH (see below)
CSB North Rd2	10/17/2020	14:00	Soil	1							X										X
CSB North Rd1 E	10/17/2020	15:30	Soil	1							X										X
CSB North Rd1 W	10/17/2020	15:45	Soil	1							X										X
CSB-N-Rd2-C1	10/17/2020	16:40	Soil	1								X	X								X
CSB-N-Rd2-C2	10/17/2020	16:50	Soil									X	X								X

Comments:

PLEASE RUSH

Deliverable Instructions:

Use naming system below for report. XXXX will be replaced by the lab Project ID

20201019_Miscellaneous_ACZ_XXXX

e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist

- ☐ Lab Contacted
- ☒ FedEx Pickup Scheduled
- ☐ _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature:	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: David Landes	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date / Time: 10/19/20 16:00	Date / Time: 10/21/20 10:41	Date / Time:	Date / Time:	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

L65563

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Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☒ N/A☐ Comments:

No discrepancies, errors, or QC failures occured

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action needed

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability are not affected

L65563

Laboratory Report Date:

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CS Site Name:

Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

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Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

L65563

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Greens Creek Concentrate Building

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)
Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?
Comments:

iii. Data quality or usability affected?
Comments:

Data quality and usability not affected

L65563

Laboratory Report Date:

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CS Site Name:

Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

May 06, 2021

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S21050
ACZ Project ID: L65563

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on April 29, 2021. This project has been assigned to ACZ's project number, L65563. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L65563. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after June 05, 2021. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C3A

ACZ Sample ID: ***L65563-01***
Date Sampled: *04/27/21 12:05*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	706			mg/Kg	3	15	05/06/21 2:34	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	90.4		*	%	0.1	0.5	04/29/21 15:30	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:41	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 14:24	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 7:30	krs

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C3B

ACZ Sample ID: ***L65563-02***
Date Sampled: *04/27/21 12:10*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	1000			mg/Kg	3	15	05/06/21 2:38	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	90.5		*	%	0.1	0.5	04/29/21 22:12	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:45	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 14:43	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 9:00	krs

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C3C

ACZ Sample ID: ***L65563-03***
Date Sampled: *04/27/21 12:20*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	1260			mg/Kg	3.03	15.2	05/06/21 2:49	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	85.0		*	%	0.1	0.5	04/30/21 1:34	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:49	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 15:02	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 10:30	krs

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C2A

ACZ Sample ID: ***L65563-04***
Date Sampled: *04/27/21 12:25*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	1520			mg/Kg	3.03	15.2	05/06/21 2:53	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	83.0		*	%	0.1	0.5	04/30/21 4:55	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:52	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 15:21	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 12:00	krs

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C2B

ACZ Sample ID: ***L65563-05***
Date Sampled: *04/27/21 12:30*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	882			mg/Kg	3.03	15.2	05/06/21 2:57	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	84.0		*	%	0.1	0.5	04/30/21 8:17	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:56	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 15:40	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 13:30	krs

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-NE-C2C

ACZ Sample ID: ***L65563-06***
Date Sampled: *04/27/21 12:35*
Date Received: *04/29/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	292			mg/Kg	3.03	15.2	05/06/21 3:01	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	85.0		*	%	0.1	0.5	04/30/21 11:38	jms

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972				*				04/29/21 15:59	jms
Digestion - Hot Plate	M3050B ICP								05/04/21 15:59	krs
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								05/04/21 15:00	krs

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

Hecla Greens Creek Mining Company ACZ Project ID: ***L65563***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG518681													
WG518681ICV	ICV	05/06/21 0:52	II210419-1	4		3.968	mg/L	99	90	110			
WG518681ICB	ICB	05/06/21 0:56				U	mg/L		-0.09	0.09			
WG518476PBS	PBS	05/06/21 1:19				U	mg/Kg		-9	9			
WG518476LCSS	LCSS	05/06/21 1:23	PCN63144	77.6		76.9	mg/Kg		64.7	90.4			
WG518476LCSSD	LCSSD	05/06/21 1:27	PCN63144	77.6		77.49	mg/Kg		64.7	90.4	1	20	
L65454-01MS	MS	05/06/21 1:34	II210503-2	101.1414	12.6	97.849	mg/Kg	84	75	125			
L65454-01MSD	MSD	05/06/21 1:38	II210503-2	101.1414	12.6	98.01	mg/Kg	84	75	125	0	20	

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG518376													
L65563-01DUP	DUP	04/29/21 18:51			90.4	92	%				2	20	
WG518376PBS	PBS	04/30/21 15:00				U	%		-0.1	0.1			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L65563***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

Hecla Greens Creek Mining Company ACZ Project ID: ***L65563***

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S21050

ACZ Project ID: L65563
Date Received: 04/29/2021 11:39
Received By:
Date Printed: 4/30/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA35003	4.2	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S21050

ACZ Project ID: L65563
Date Received: 04/29/2021 11:39
Received By:
Date Printed: 4/30/2021

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L65563 Chain of Custody

L65563-2105061521

Chain of Custody Record / Analysis Request L65563

Hecla

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **Miscellaneous**

Report To: gcenvdata@hecla-mining.com

Sampler: DL

P.O.Number: S21050

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: 4 oz. Clear Glass	Total Lead (Pb)	pH < 2	RUSH (see below)
CSB-NE-C3A	4/27/2021	1205	Soil	1	X		X
CSB-NE-C3B	4/27/2021	1210	Soil	1	X		X
CSB-NE-C3C	4/27/2021	1220	Soil	1	X		X
CSB-SE-C2A	4/27/2021	1225	Soil	1	X		X
CSB-SE-C2B	4/27/2021	1230	Soil	1	X		X
CSB-SE-C2C	4/27/2021	1235	Soil	1	X		X

Comments:

PLEASE RUSH

Deliverable Instructions:
Use naming system below for report. XXXX will be replaced by the lab Project ID

20210427_Miscellaneous_ACZ_XXXX

e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist

- ☐ Lab Contacted
- ☐ FedEx Pickup Scheduled
- ☐ _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature:	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: David Landes	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date/ Time: 4/27/21 1800	Date / Time:	Date / Time:	Date / Time: 4/28/21 11:39	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis do not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☒ N/A☐ Comments:

No discrepancies, errors, or QC failures occured

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective action needed

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability are not affected

L65563

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CS Site Name:

Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

L65563

Laboratory Report Date:

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Greens Creek Concentrate Building

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

L65563

Laboratory Report Date:

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CS Site Name:

Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

L65563

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CS Site Name:

Greens Creek Concentrate Building

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)
Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?
Comments:

iii. Data quality or usability affected?
Comments:

Data quality and usability not affected

L65563

Laboratory Report Date:

May 6, 2021

CS Site Name:

Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

November 19, 2021

Report to:
gcenvdata@hecla-mining.com
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99801-2199

Bill to:
Accounts Payable
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803-2199

Project ID: S21050
ACZ Project ID: L69792

gcenvdata@hecla-mining.com:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 09, 2021. This project has been assigned to ACZ's project number, L69792. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L69792. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after December 19, 2021. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-SE-C3A

ACZ Sample ID: ***L69792-01***
Date Sampled: *11/02/21 15:50*
Date Received: *11/09/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	102	1660			mg/Kg	3.06	15.3	11/19/21 1:15	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	79.8		*	%	0.1	0.5	11/17/21 10:10	mlp

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								11/11/21 15:36	jpb
Digestion - Hot Plate	M3050B ICP								11/16/21 12:44	mep
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								11/16/21 8:40	mep

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-SE-C3B

ACZ Sample ID: ***L69792-02***
Date Sampled: *11/02/21 15:55*
Date Received: *11/09/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	101	824			mg/Kg	3.03	15.2	11/19/21 1:23	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	80.0		*	%	0.1	0.5	11/17/21 21:12	mlp

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								11/11/21 15:48	jpb
Digestion - Hot Plate	M3050B ICP								11/16/21 13:12	mep
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								11/16/21 8:50	mep

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-SE-C3C

ACZ Sample ID: ***L69792-03***
Date Sampled: *11/02/21 16:00*
Date Received: *11/09/21*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead, total (3050)	M6010D ICP	100	564			mg/Kg	3	15	11/19/21 1:27	kja

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	D2216-80	1	80.8		*	%	0.1	0.5	11/18/21 2:43	mlp

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								11/11/21 16:00	jpb
Digestion - Hot Plate	M3050B ICP								11/16/21 13:40	mep
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								11/16/21 9:00	mep

Hecla Greens Creek Mining Company
Project ID: S21050
Sample ID: CSB-SE-TCLP

ACZ Sample ID: ***L69792-04***
Date Sampled: *11/02/21 16:05*
Date Received: *11/09/21*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010A ICP								11/17/21 14:58	jlw

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lead (TCLP)	M6010D ICP	1	1680		*	ug/L	30	150	11/18/21 11:56	jlw

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
TCLP Metal Extraction	M1311								11/16/21 7:56	ksf

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

REP001.03.15.02

HECLAAK

ACZ Project ID: ***L69792***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead (TCLP) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG531982													
WG531982ICV	ICV	11/18/21 11:12	II211104-6	4		4.063	mg/L	102	90	110			
WG531982ICB	ICB	11/18/21 11:16				.031	mg/L		-0.09	0.09			
WG531736PBS	PBS	11/18/21 11:40				U	mg/L		-0.09	0.09			
WG531736LFB	LFB	11/18/21 11:44	IITCLPSPIKE	1.001		.946	mg/L	95	80	120			
L69792-04DUP	DUP	11/18/21 12:00			1.68	2.76	mg/L				49	20	RD
L69792-04MS	MS	11/18/21 12:04	IITCLPSPIKE	1.001	1.68	2.52	mg/L	84	75	125			
L69792-04MSD	MSD	11/18/21 12:09	IITCLPSPIKE	1.001	1.68	2.509	mg/L	83	75	125	0	20	

Lead, total (3050) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG531895													
WG531895ICV	ICV	11/19/21 0:02	II211104-6	4		3.945	mg/L	99	90	110			
WG531895ICB	ICB	11/19/21 0:05				U	mg/L		-0.09	0.09			
WG531755PBS	PBS	11/19/21 0:28				U	mg/Kg		-9	9			
WG531755LCSS1	LCSS	11/19/21 0:32	PCN63583	130		124.8	mg/Kg		107	152			
WG531755LCSSD1	LCSSD	11/19/21 0:35	PCN63583	130		126.5	mg/Kg		107	152	1	20	
L69587-01MS	MS	11/19/21 0:50	II211104-5	101.1414	5.06	99.869	mg/Kg	94	75	125			
L69587-01MSD	MSD	11/19/21 0:53	II211104-5	101.1414	5.06	99.697	mg/Kg	94	75	125	0	20	

Solids, Percent D2216-80

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG531873													
L69792-01DUP	DUP	11/17/21 15:41			79.8	79.5	%				0	20	
WG531873PBS	PBS	11/18/21 8:15				U	%		-0.1	0.1			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Hecla Greens Creek Mining Company ACZ Project ID: ***L69792***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L69792-04	WG531982	Lead (TCLP)	M6010D ICP	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
			M6010D ICP	ZG	The ICP or ICP-MS Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.

Hecla Greens Creek Mining Company ACZ Project ID: ***L69792***

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Solids, Percent	D2216-80

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S21050

ACZ Project ID: L69792
Date Received: 11/09/2021 11:18
Received By:
Date Printed: 11/10/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	X		

A change was made in the sample 4 ID was crossed out and rewritten section prior to ACZ custody.

A change was made in the sample 4 ID was crossed out and rewritten section prior to ACZ custody.

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Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Hecla Greens Creek Mining Company
S21050

ACZ Project ID: L69792
Date Received: 11/09/2021 11:18
Received By:
Date Printed: 11/10/2021

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA36396	5.6	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L69792-2111190956

L69792 Chain of Custod Custody Record / Analysis Request L69792

Hecla

Lab Sent To: ACZ

Company Address:
Hecla Greens Creek Mining Company
P.O. Box 32199
Juneau, AK 99803

Project Name: **Miscellaneous**

Report To: gcenvdata@hecla-mining.com

Sampler: DL

P.O.Number: S21050

Telephone: (907) 790-XXXX
8482 D. Maller 8420 D. Landes
8457 C. Sell 8461 G. Fredheim

Sample I.D.	Date Collected	Time Collected	Matrix Water / Soil	Container: Glass Jar	Total Pb	TCLP Pb	pH < 2	RUSH (see below)
CSB-SE-C3A	11/2/2021	1550	Soil	1	X			
CSB-SE-C3B	11/2/2021	1555	Soil	1	X			
CSB-SE-C3C	11/2/2021	1600	Soil	1	X			
~~CSB-SE-TCLP~~ CSB-SE-TCLP	11/2/2021	1605	Soil	1		X		

Comments:

Deliverable Instructions:
Use naming system below for report. XXXX will be replaced by the lab Project ID
20211102_Miscellaneous_ACZ_XXXX
e-mail to: gcenvdata@hecla-mining.com

Shipment Checklist
- [x] Lab Contacted
- [x] FedEx Pickup Scheduled
- [ ] _____

RELINQUISHED BY SAMPLER:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Condition of Sample Containers:
Signature: DLM	Signature:	Signature:	Signature:	Temp Received: _____ °C
Printed Name: Doug Maller	Printed Name:	Printed Name:	Printed Name:	# of Coolers: _____
Firm: HGCMC	Firm:	Firm:	Firm:	Seals Intact: _____
Date / Time: 11/2/21 16:35	Date / Time: 11/9/21 11:18	Date / Time:	Date / Time:	Page _____ of _____

Laboratory Data Review Checklist

Completed By:

Jennifer Stoutamore

Title:

Staff Professional II

Date:

5/16/2022

Consultant Firm:

NORTECH

Laboratory Name:

ACZ Laboratories

Laboratory Report Number:

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

ADEC File Number:

1513.38.120

Hazard Identification Number:

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☐ No☒ N/A☐ Comments:

   ACZ Laboratories, Inc. received and performed sample analysis

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature documented, metals analysis does not have a temperature requirement

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Metals do not require preservation

L69792

Laboratory Report Date:

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Greens Creek Concentrate Building

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☐ No☐ N/A☒ Comments:

Yes, samples OK

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies found

e. Data quality or usability affected?

Comments:

Data quality and usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☐ No☒ N/A☐ Comments:

MS/MSD RPD does not meet QC, Serial dilution was not sued for data validation as sample concentration was less than 50 times the MDL

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

No corrective action possible

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability not affected as RPD failure due to non-homogeneity of the sample.

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Greens Creek Concentrate Building

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☒ N/A☐ Comments:

TCLP results are reported as mg/L

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

Data quality and usability not affected

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Below LOQ

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Below LOQ

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☐ No☒ N/A☐ Comments:

No organic analysis requested

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

L69792

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CS Site Name:

Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

%R and RPD met QC for the LCS/LCSD

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

MS/MSD RPD did not meet QC due to the sample matrix not being homogenous

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

CSB-SE-TCLP

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

Yes, and clearly defined

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☒ N/A☐ Comments:

No organics analysis requested

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No organics analysis requested

iv. Data quality or usability affected?

Comments:

Data quality and usability not affected

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No volatile analysis requested

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Data quality and usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☐ No☒ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☐ No☒ N/A☐ Comments:

L69792

Laboratory Report Date:

November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

No duplicate submitted

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Equipment blank not necessary as reusable sampling equipment was decontaminated at the on-Site laboratory using HGCMC's internal SOPs

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

L69792

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November 19, 2021

CS Site Name:

Greens Creek Concentrate Building

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

Attachment C

Disposal Paperwork and Permission to Transport

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention Preparedness and Response Programs

Contaminated Media Transport and Treatment or Disposal Approval Form

DEC HAZARD/SPILL ID #	NAME OF CONTAMINATED SITE OR SPILL	
27226	Greens Creek Mine	
CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION		
Concentrate Building, Hawk Inlet, Admiralty Island		
CURRENT PHYSICAL LOCATION OF MEDIA	**SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)**	
Hawk Inlet, Admiralty Island	Gradual migration of concentrate through gaps in siding of building	
CONTAMINANTS OF CONCERN	**ESTIMATED VOLUME**	**DATE(S) GENERATED**
Lead	124,000 Pounds	Slowly over the last several years
POST TREATMENT ANALYSIS REQUIRED *(such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)*		
Stabilization		
COMMENTS OR OTHER IMPORTANT INFORMATION		

TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA	PHYSICAL ADDRESS/PHONE NUMBER
Chemical Waste Managment of the Northwest	17629 Cedar Springs Lane, Arlington OR 97812 541-454-2643
RESPONSIBLE PARTY	**ADDRESS/PHONE NUMBER**
Hecla Greens Creek Mine	3000 Vintage Blvd, Suite 102, 907-790-8461
WASTE MANAGEMENT CO. / ORGANIZER	**ADDRESS/PHONE NUMBER**
Chris Beasley	720-4th Avenue Suite 400 Kirkland, WA 98033 206-305-9463

***Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.**

Gunnar Fredheim
Name of the Person Requesting Approval (printed)

Environmental Specialist
Title/Association

Gunnar Fredheim Digitally signed by Gunnar Fredheim Date: 2020.12.03 14:02:35 -09'00'
Signature

12/03/2020
Date

907-790-8461
Phone Number

----------**DEC USE ONLY**----------

Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

Jessica Hall
DEC Project Manager Name (printed)

Environmental Program Specialist III
Project Manager Title

Jessica Hall Digitally signed by Jessica Hall Date: 2020.12.07 13:00:07 -09'00'
Signature

12/7/2020
Date

907-269-7553
Phone Number

Rev. 01/2020

479843 PO 732093 1/15

Please print or type (Form designed for use on elite (12-pitch) typewriter) Form Approved OMB No 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: AKD 983067307
2. Page 1 of: 2
3. Emergency Response Phone: 800-424-9300
4. Manifest Tracking Number: 008411549 FLE

5. Generator's Name and Mailing Address
GREENS CREEK MINING
P.O. BOX 32199
JUNEAU, AK 99803 907-790-8461
Generator's Phone:

Generator's Site Address (if different than mailing address)
GREENS CREEK MINING
HAWK INLET, ADMIRALTY ISLAND
JUNEAU, AK 99801 TMI-20-21 TMI-30-21

6. Transporter 1 Company Name: ALASKA MARINE LINES
U.S. EPA ID Number: WAD 991281809

7. Transporter 2 Company Name: UNION PACIFIC RAILROAD
U.S. EPA ID Number: NED 001 792910

8. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT
17629 CEDAR SPRINGS LN
Facility's Phone: ARLINGTON, OR 97812 541-454-2643
U.S. EPA ID Number: ORD 089452353

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
X	1. UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S., 9, PG III	1	CM	39,340	P	D008
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
WEIGHT LISTED IS NET WEIGHT OF MATERIAL 38800#.
1.OR 346109 CONTAINER PNGC 208006

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: GUNNAR FREDHEIM
Signature:
Month Day Year: 12 22 20

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: J. GAVIN FINCH
Signature:
Month Day Year: 12 21 20
Transporter 2 Printed/Typed Name: JASON STEARNS
Signature:
Month Day Year: 1 1 3 21

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. H110 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: MORGAN WOLF
Signature:
Month Day Year: 01 18 21

EPA Form 8700-22 (Rev 3/05) Previous editions are obsolete. DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

479837 PRO 732108 1 | 4

Please print or type (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: AKD983067307
2. Page 1 of: 2
3. Emergency Response Phone: 800-424-9300
4. Manifest Tracking Number: 008411550 FLE

5. Generator's Name and Mailing Address: GREENS CREEK MINING, PO Box 32199, JUNEAU, AK 99803, 907-790-8461
Generator's Site Address (if different than mailing address): GREENS CREEK MINING, HAWK INLET, ADMIRALTY ISLAND, JUNEAU, AK 99801

6. Transporter 1 Company Name: ALASKA MARINE LINES — U.S. EPA ID Number: WAD991281809

7. Transporter 2 Company Name: UNION PACIFIC RAILROAD — U.S. EPA ID Number: NED001792910

8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, 17629 CEDAR SPRINGS LN, ARLINGTON, OR 97812, 541-454-2643 — U.S. EPA ID Number: ORD089452353

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
X	1. UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S., 9, PG III	1	CM	35,090	P	D008
	2.					
	3					
	4					

14. Special Handling Instructions and Additional Information: WEIGHT LISTED IS NET WEIGHT OF MATERIAL 35480p.
1. OR 346109 CONTAINER PNGC08005

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: GUNNAR FREDHEIM — Signature: [signature] — Month 12 Day 22 Year 20

INTERNATIONAL SHIPMENTS
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: [illegible] — Signature: [signature] — Month 12 Day 30 Year 20
Transporter 2 Printed/Typed Name: SR — Signature: [signature] — Month 1 Day 13 Year 21

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. H110 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: Morgan Wolf — Signature: MWolf — Month 01 Day 18 Year 21

EPA Form 8700-22 (Rev. 03-05) Previous editions are obsolete DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

PRO 732216 1/15

Please print or type. (Form designed for use on elite (12-pitch) typewriter) 479842 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: AKD983067307
2. Page 1 of: 2
3. Emergency Response Phone: 800-424-9300
4. Manifest Tracking Number: 008411551 FLE

5. Generator's Name and Mailing Address: GREENS CREEK MINING, PO BOX 32199, JUNEAU, AK 99803, 907-790-8461
Generator's Site Address (if different than mailing address): GREENS CREEK MINING, HAWK INLET, ADMIRALTY ISLAND, JUNEAU, AK 99801

6. Transporter 1 Company Name: ALASKA MARINE LINES — U.S. EPA ID Number: WAD 991281809

7. Transporter 2 Company Name: UNION PACIFIC RAILROAD — U.S. EPA ID Number: NED001792910

8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, 17629 CEDAR SPRINGS LN, ARLINGTON, OR 97812, 541-454-2643 — U.S. EPA ID Number: ORD 089452353

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
X	1. UN3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S., 9, PG III	1	CM	31,540	P	D009
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
WEIGHT LISTED IS NET WEIGHT OF MATERIAL
1. OR 346109 CONTAINER PNGC208004

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: GUNNAR FREDHEIM — Signature: [signature] — Month/Day/Year: 12/22/20

INTL
16. International Shipments: ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.
Transporter signature (for exports only):

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: J. Gavin Rich — Signature: [signature] — Month/Day/Year: 12/24/20
Transporter 2 Printed/Typed Name: Jason Steans — Signature: [signature] — Month/Day/Year: 12/13/21

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space: ☐ Quantity ☑ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Freeliquid in CM is rainwater from record rainfall in Ak. Per Gunnar Fredheim/GreensCreek. JD
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number 1/19/21
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. H110 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: Morgan Wolf — Signature: [signature] — Month/Day/Year: 01/19/21

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.
DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

479838 PRO 732224

Please print or type. (Form designed for use on elite (12-pitch) typewriter) Form Approved. OMB No 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: AKD983067307
2. Page 1 of: 2
3. Emergency Response Phone: 800-424-9300
4. Manifest Tracking Number: 008411552 FLE

GENERATOR

5. Generator's Name and Mailing Address: GREENS CREEK MINING, PO Box 32199, JUNEAU, AK 99803, 907-790-8411
Generator's Site Address (if different than mailing address): GREENS CREEK MINING, HAWK INLET, ADMIRALTY ISLAND, JUNEAU, AK 99801

6. Transporter 1 Company Name: ALASKA MARINE LINES
U.S. EPA ID Number: WAD 991281809

7. Transporter 2 Company Name: UNION PACIFIC RAILROAD
U.S. EPA ID Number: NED 001792910

8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, 17629 CEDAR SPRINGS LN, ARLINGTON, OR 97812, 541-454-2643
U.S. EPA ID Number: ORD 089452353

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
X	1. UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S., 9, PG III	10 ~~12~~ JW 1.19.21	CF	24,200	P	D008
	2.					
	3.					
	4					

14. Special Handling Instructions and Additional Information: WEIGHT LISTED IS THE NET WEIGHT OF MATERIAL
1. OR 346109 CONTAINER AMLU 261123

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: GUNNAR FREDHEIM
Signature:
Month Day Year: 12 22 20

TR ANSPORTER INTL

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: J. Kanji Kadl
Signature:
Month Day Year: 12 24 20
Transporter 2 Printed/Typed Name: JK
Signature:
Month Day Year: 1 13 21

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☑ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Piece count correction per Gunnar Fredheim/Greens Creek Mining JW 1.19.21
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. H11D 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: Dunder
Signature:
Month Day Year: 1 15 21

7700-22 (Rev. 3-05) Previous editions are obsolete DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

HECLA GREENS CREEK MINING CO
ATTN: MANIFEST SECTION
AKD983067307
ADMIRALTY ISLAND
JUNEAU AK 99801

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from HECLA GREENS CREEK MINING CO on 01/18/21 as described on Shipping Document number 008411549FLE.

Profile Number: OR346109
CWM Tracking ID: 47984301
CWM Unit #: 1*0
Disposal Date: 01/20/21

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

CWMNW RECORDS DEPARTMENT
Certificate # 253574
02/10/21

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

HECLA GREENS CREEK MINING CO
ATTN: MANIFEST SECTION
AKD983067307
ADMIRALTY ISLAND
JUNEAU AK 99801

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from HECLA GREENS CREEK MINING CO on 01/18/21 as described on Shipping Document number 008411550FLE.

Profile Number: OR346109
CWM Tracking ID: 47983701
CWM Unit #: 1*0
Disposal Date: 01/20/21

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

CWMNW RECORDS DEPARTMENT
Certificate # 253573
02/10/21

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT
17629 Cedar Springs Lane
Arlington, OR 97812

HECLA GREENS CREEK MINING
AKD983067307
HAWK INLET, ADMIRALTY ISLAND
JUNEAU, AK 99801

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc., ORD089452353, has received the following waste material:

GENERATOR:	HECLA GREENS CREEK MINING
MANIFEST #:	008411551FLE
CWM TRACKING ID:	479842-01
PROFILE #:	OR346109
LINE ITEM:	9b.1
QUANTITY:	1 RO
RECEIVED DATE:	01/19/21
DISPOSAL PROCESS(ES):	STABILIZATION TO LANDFILL
FINAL DISPOSAL LOCATION:	LANDFILL 14
DISPOSAL DATE:	01/19/21

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

CWMNW RECORDS DEPARTMENT
Date: 1/29/2021

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT
17629 Cedar Springs Lane
Arlington, OR 97812

HECLA GREENS CREEK MINING
AKD983067307
HAWK INLET, ADMIRALTY ISLAND
JUNEAU, AK 99801

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc., ORD089452353, has received the following waste material:

GENERATOR:	HECLA GREENS CREEK MINING
MANIFEST #:	008411552FLE
CWM TRACKING ID:	479838-01
PROFILE #:	OR346109
LINE ITEM:	9b.1
QUANTITY:	10 CF
RECEIVED DATE:	01/19/21
DISPOSAL PROCESS(ES):	STABILIZATION TO LANDFILL
FINAL DISPOSAL LOCATION:	LANDFILL 14
DISPOSAL DATE:	01/19/21

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

CWMNW RECORDS DEPARTMENT
Date: 1/29/2021

Attachment D

Communications with ADEC

Hecla
GREENS CREEK

2 October 2019

VIA HAND-DELIVERY

Mr. David Khan
ADEC DOW-MTSS
P.O. Box 111800
Juneau, AK 99811-1800
david.khan@alaska.gov

Re: Management of Impacted Soils at Concentrate Storage Building

Dear Mr. Khan:

We are writing to notify you that on August 20-21, 2019, Environmental Protection Agency (EPA) inspectors Peter Magolske and Jon Jones conducted an RCRA inspection at Hecla Greens Creek Mining Company's (HGCMC) facility. During the inspection, the EPA inspectors observed concentrate material around the perimeter of the Concentrate Storage Building. HGCMC inspected the Concentrate Storage Building and found small gaps through which the concentrate can escape. HGCMC is in the process of conducting repairs to the Concentrate Storage Building. This letter presents our proposal to remove the concentrate material and excavate any impacted soils around the exterior of the building and, with EPA's and DEC's approval, dispose of any residual concentrate and impacted soils in the tailings disposal facility.

HGCMC proposes to remove the concentrate and impacted soils around the exterior of the Concentrate Storage Building in two phases. Phase 1 will consist of the recovery of the concentrate for reprocessing in the mill. To avoid collecting impacted soils, removal during phase 1 will be with shovels. During phase 2 any remaining concentrate and impacted soil will be excavated to ensure all the concentrate was removed. We estimate the excavation to be approximately 2-3 feet around the perimeter of the building to a depth of 12 to 18 inches. We estimate generating about 35 cubic yds. of residual concentrate and soil. All excavated material will be placed into covered containers and labeled appropriately.

The residual concentrate and soil are expected to contain minimal concentrations of lead and zinc and should be of similar composition as waste from the mill that is currently placed in the tailings disposal facility. As a product of beneficiation process, the concentrate is subject to the Bevill Amendment and would not be considered hazardous waste. Pursuant to Condition 2.1.1.1.4.3 of the Waste Management Permit (Permit No. 2014DB0003), HGCMC seeks DEC's approval to place the excavated material in the tailings disposal facility.

18 AAC 75.341 establishes the following cleanup levels: Lead: 400 mg/kg and Zinc: 25,000 mg/kg. HGCMC proposes to use the regulatory cleanup level of 25,000 mg/kg for Zinc and a proposed cleanup level of 1,000 mg/kg for Lead. Given the use of the facility and the on-going operations, HGCMC believes these levels are protective of human health and the environment. Confirmation samples will be collected from the areas excavated. HGCMC will provide DEC and EPA with a copy of the sampling results.

We would appreciate DEC's written approval to place the residual material and impacted soil into the tailings disposal facility.

Please let me know if I can provide you with additional information.

Very truly yours,

Christopher Wallace

Christopher Wallace

Environmental Manager
Hecla Greens Creek Mining Company

cc: P. Magolske, EPA (via electronic mail)
J. Jones, EPA (via electronic mail)

Hecla
GREENS CREEK

28 October 2019

VIA ELECTRONIC MAIL

Mr. David Khan
ADEC DOW-MTSS
P.O. Box 111800
Juneau, AK 99811-1800
david.khan@alaska.gov

Re: Management of Impacted Soils at Concentrate Storage Building

Dear Mr. Khan:

This letter is a follow up to the October 2, 2019 letter provided to you (with a copy to the EPA Region 10) that described HGCMC's proposed plan for managing concentrate material and potentially impacted soils around the exterior of the Concentrate Storage Building. The proposed plan is to remove the impacted soils in two phases. The material removed in phase 1 will be primarily concentrate, which HGCMC would reprocess through the mill. The material removed in phase 2 is expected to contain minimal concentrations of lead and zinc. HGCMC requested approval from the ADEC and EPA to dispose of this material in the permitted Tailings Disposal Facility (TDF).

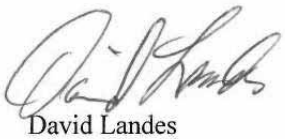
The EPA responded to HGCMC via telephone and e-mail on October 15. Their stated position is that the phase 1 material can be reprocessed through the mill, but the phase 2 material is not eligible for the Bevill exemption and would be potentially subject to hazardous waste regulation. Though HGCMC disagrees with the EPA response, we currently are not challenging their position on the eligibility of the phase 2 material for the Bevill exemption. Therefore, the revised plan for managing the phase 2 material will be to collect a representative sample of the excavated material for metals analysis using the Toxicity Characteristic Leaching Procedure (TCLP), test Method 1311. If the sample results have metals at a concentration above the regulatory level, then HGCMC will ship the material offsite to a permitted hazardous waste disposal facility. If the sample results show the material does not exhibit the toxicity characteristic for metals, then HGCMC will dispose of the material onsite in the TDF, as is allowed under section 2.1.2.1.9 of the Waste Management Permit (Permit No. 2014DB0003).

In addition to the waste characterization sample, confirmation samples will be collected from the base of the excavation to ensure the removal of all concentrate and impacted soils. 18 AAC 75.341 establishes the following cleanup levels: Lead: 400 mg/kg and Zinc: 25,000 mg/kg. HGCMC proposes to use the regulatory cleanup level of 25,000 mg/kg for Zinc and a proposed

cleanup level of 1,000 mg/kg for Lead. Given the use of the facility and the on-going operations, HGCMC believes these levels are protective of human health and the environment. Following completion of the cleanup, HGCMC will provide ADEC and EPA with a summary report, including photo documentation and all sampling results.

We would appreciate DEC's written approval of this plan. Please let me know if I can provide you with additional information.

Very truly yours,



David Landes

Sr. Environmental Engineer
Hecla Greens Creek Mining Company

cc: P. Magolske, EPA (via electronic mail)
K. Schanilec, EPA (via electronic mail)

Hecla
GREENS CREEK

12 May 2020

VIA EMAIL

Ms. Jessica Hall
ADEC CSP
555 Cordova Street
Anchorage, AK 99501
Jessica.hall@alaska.gov

Re: Management of Residual Concentrate at Concentrate Storage Building, Greens Creek Mine

Dear Ms. Hall:

This follows-up on your request regarding additional information on the status of the removal of residual concentrate around the perimeter of the Concentrate Storage Building (CSB) at the Greens Creek Mine.

By way of background, Greens Creek Mine is solely owned and operated by the Hecla Greens Creek Mining Company (HGCMC). The mine and milling operations are located on the northern end of Admiralty Island, 18 miles southwest of Juneau. HGCMC produces lead, zinc, and bulk concentrates at the mine site and trucks them daily in covered trailers to the CSB at the port facility, 8 miles away. The Greens Creek Mine production of ore concentrate began in February 1989.

Figure 1 shows the relative location of the port facility to Juneau. The yellow outline approximates the boundary of the private property owned by HGCMC. In the late 1980s, the CSB was built on fill material placed for the development of the port facility. The average elevation of the CSB is approximately 25 feet asl. The nearest potable water intake is located on Cannery Creek approximately 2,500 feet away at an elevation of ~180 feet.

As I mentioned, the Environmental Protection Agency (EPA) conducted a RCRA inspection of the facility on August 20-21, 2019. During the inspection, the EPA inspectors observed concentrate material around the perimeter of the CSB. HGCMC inspected the CSB and found small gaps, corrugations in the metal siding, through which the concentrate could escape. Shortly after the inspection, HGCMC formulated a plan to remove the concentrate material and any residuals around perimeter of the CSB.

In the plan, HGCMC proposed to remove the concentrate and impacted soils around the exterior of the CSB in two phases. Phase 1 would consist of the recovery of the concentrate for reprocessing in the mill. Shovels would be used during phase 1 to prevent the excessive removal of soil. During phase 2 any remaining concentrate and impacted soil would be excavated. We estimated the excavation would be approximately 2-3 feet around the perimeter of the CSB to a depth of 12 to 18 inches. It was estimated this would generate about 35 cubic yds. of residual concentrate and soil. All excavated material will be placed into covered containers and labeled appropriately. HGCMC's plan to remove the concentrate and impacted soil was communicated to EPA and ADEC last Fall. Copies of the emails and correspondence are attached.

To date, HGCMC has recovered and reprocessed the concentrate described in phase 1. Prior to implementing phase 2, HGCMC planned to seal the CSB to minimize the future escapement of products from the CSB. This work was contracted to begin in April 2020. However, due to the Covid-19 mitigation measures imposed by the state, HGCMC implemented a 14-day quarantine period for all personnel, including contractors. The contractor who was to conduct the work was not willing to quarantine. HGCMC hopes to complete the work as soon as the mitigation measures are lifted.

Following the removal of any residual concentrate and soil around the perimeter of the CSB, HGCMC will take confirmation samples. Figure 2 shows the approximate locations of the confirmation samples. Because of the lag (+7 days) between collecting samples and receiving results from an independent laboratory, the plan is to run confirmation sampling in-house until Lead values are at or below 1,500 mg/kg and the Zinc values are at or below 25,000 mg/kg. The in-house laboratory can return results in less than 24 hours, which provides immediate feedback to the operations group signaling if additional material needs removed. Once the above thresholds are reached in-house, final confirmation samples will be collected and sent to an independent laboratory for verification.

18 AAC 75.341 establishes the following cleanup levels: Lead: 800 mg/kg (industrial) and Zinc: 25,000 mg/kg. For the removal of the residual concentrate around the perimeter of the CSB, HGCMC proposes to use the regulatory cleanup level of 25,000 mg/kg for Zinc and a proposed cleanup level of 1,000 mg/kg for Lead. Given the current use of the facility and the on-going operations, HGCMC believes these levels are protective of human health and the environment. At closure, the whole of the operations, including the CSB, will be reclaimed in accordance with the Reclamation Plan approved by the Alaska Department of Natural Resources.

The residual concentrate and soil are expected to contain minimal concentrations of lead and zinc and should be of similar composition as waste from the mill that is currently placed in the tailings disposal facility under the Waste Management Permit issued by ADEC. As a product of the beneficiation process, the concentrate is subject to the Bevill Amendment and would not be regulated as a hazardous waste. However, in subsequent discussions with ADEC and the EPA, HGCMC has agreed to complete a TCLP analysis on the removed material and manage the material accordingly.

You specifically requested a "Phase I report". I am not aware of any "Phase I report." As noted above, the CSB was constructed in the late 1980s and ore production commenced in 1989. HGCMC has not prepared any "reports" related to the removal of the residual concentrate. Copies of the laboratory reports for the confirmation samples and the TCLP analysis will be sent to EPA and ADEC upon completion of the work.

We appreciate the opportunity to provide this information. Please let me know if you have any additional questions.

Very truly yours,

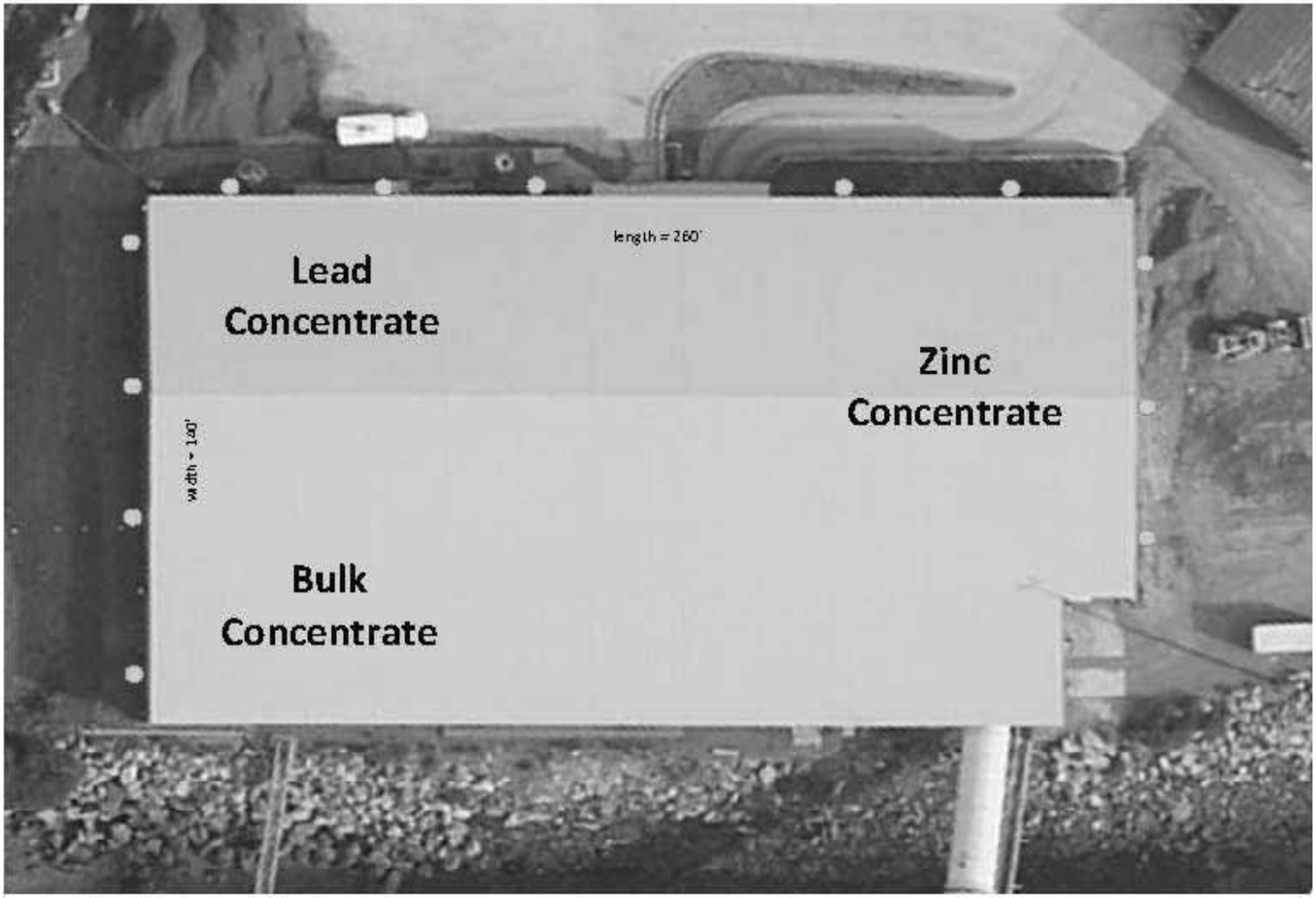
Christopher Wallace

Christopher Wallace

Permitting and Environmental Compliance Coordinator
Hecla Greens Creek Mining Company

Figure 1. HGCMC - Port Facility Site Map

Figure 2. HGCMC - Concentrate Stroage Building Confirmation Sampling Locations



Hecla
GREENS CREEK

27 August 2020

VIA EMAIL

Ms. Jessica Hall
ADEC CSP
555 Cordova Street
Anchorage, AK 99501
Jessica.hall@alaska.gov

Re: HGCMC Concentrate Storage Building

Dear Ms. Hall:

I want to give you an update on the Concentrate Storage Building (CSB) located at the Greens Creek Mine, Admiralty Island. Hecla Greens Creek Mining Company (HGCMC) was successful in sealing the CSB. Unfortunately, this process took considerably longer than HGCMC would like to have taken. HGCMC appreciated the state's patience as we worked to bring the contractor to site in a manner that was protective of our workforce, given the restrictions we all are living with because of the Covid-19 pandemic.

The interior of the metal siding of the CSB was sprayed with expanding foam, the white material in Figure 1. This material was also used to fill void spaces between the siding and other building elements. The foam was topped with a protective spray-on liner, the brown material in Figure 1.

Figure 1. CSB sealing - foam and liner

Figure 2 is a closeup of the foam/liner covering, showing how the foam and liner have contoured to the shape of the siding and were brought out over the interior wall. In the center of the figure

are streaks caused by moisture running down the siding. Before sealing, this moisture would have continued down the panel dripping to the exterior of the building. As seen in the figure, the moisture is now directed to the interior of the building.

Figure 2. Closeup of the sealed siding

With the building sealed and before the onset of fall weather, HGCMC desires to proceed with the cleanup as described in the letter previously sent to you dated 12 May 2020. Does the state approve of HGCMC's plan for the removal and disposal of residual material from the exterior of the CSB?

Please let me know if I can provide you with additional information.

Very truly yours,

Christopher Wallace

Christopher Wallace

Permitting and Environmental Compliance Coordinator
Hecla Greens Creek Mining Company

Attachment E

Conceptual Site Model

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Greens Creek Concentrate Storage Building

Completed By: Jennifer Stoutamore

Date Completed: 5/12/2022

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Current & Future Receptors: Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☐ Direct release to surface soil — check soil	☑ soil	☑ Incidental Soil Ingestion		C/F	C/F				
	☐ Migration to subsurface — check soil		☐ Dermal Absorption of Contaminants from Soil							
	☐ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☐ Volatilization — check air	☐ groundwater	☐ Ingestion of Groundwater							
	☐ Runoff or erosion — check surface water		☐ Dermal Absorption of Contaminants in Groundwater							
	☐ Uptake by plants or animals — check biota		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Other (list):	☐ air	☐ Inhalation of Outdoor Air							
☐ Subsurface Soil (2-15 ft bgs)	☐ Direct release to subsurface soil — check soil		☐ Inhalation of Indoor Air							
	☐ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☐ Volatilization — check air	☐ surface water	☐ Ingestion of Surface Water							
	☐ Uptake by plants or animals — check biota		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Other (list):		☐ Inhalation of Volatile Compounds in Tap Water							
☐ Ground-water	☐ Direct release to groundwater — check groundwater	☐ sediment	☐ Direct Contact with Sediment							
	☐ Volatilization — check air	☐ biota	☐ Ingestion of Wild or Farmed Foods							
	☐ Flow to surface water body — check surface water									
	☐ Flow to sediment — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Surface Water	☐ Direct release to surface water — check surface water									
	☐ Volatilization — check air									
	☐ Sedimentation — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Sediment	☐ Direct release to sediment — check sediment									
	☐ Resuspension, runoff, or erosion — check surface water									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									

Revised, 10/01/2010

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: Greens Creek Concentrate Storage Building

File Number: 1513.38.120

Completed by: Jennifer Stoutamore

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Lead and Zinc concentrate spillage from the concentrate storage building

Release Mechanisms *(check potential release mechanisms at the site)*

- ☐ Spills
- ☐ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☒ Other: The building was not sealed and concentrate pushed against the inner walls of the building fell outside.

Impacted Media *(check potentially-impacted media at the site)*

- ☒ Surface soil (0-2 feet bgs*)
- ☐ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☐ Sediment
- ☐ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☐ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☐ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

The Site is a working lead and zinc mine. Safety measures and internal standard operating procedures are in place to ensure lead and zinc exposure is minimized for worker safety.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☐

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Incomplete

Comments:

The nearest drinking water source is 2,500 feet away and up gradient of the mine.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

The nearest surface water is marine and is unlikely to be used as a drinking water source. There is no surface water at the Site.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☐

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

The Site is an active mine and forageable foods are not present.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☐

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

The Concentrate Storage Building is used for storage of lead and zinc concentrate. Workers enter the building only to move concentrate into or out of the building.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

The Site is a working lead and zinc mine. Safety measures and internal standard operating procedures are in place to ensure lead and zinc exposure is minimized for worker safety. Safety measures to minimize worker exposure are compliant with OSHA standards. Safety measures currently in place due to the nature of work at the mine are sufficient to minimize the exposure to fugitive dust if it were present at the Site.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

The Site is a working lead and zinc mine. Safety measures and internal standard operating procedures are in place to ensure lead and zinc exposure is minimized for worker safety. Safety measures to minimize worker exposure are compliant with OSHA standards.