

Palmer Project Aquatic Studies, 2025

by

Dylan Krull



July 2026

Alaska Department of Fish and Game

Habitat Section



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mideye-to-fork	MEF
gram	g	all commonly accepted		mideye-to-tail fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	Mathematics, statistics	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
nanometer	nm	east	E	alternate hypothesis	H _A
		north	N	base of natural logarithm	<i>e</i>
Weights and measures (English)		south	S	catch per unit effort	CPUE
cubic feet per second	ft ³ /s	west	W	coefficient of variation	CV
foot	ft	copyright	©	common test statistics	(F, t, χ^2 , etc.)
gallon	gal	corporate suffixes:		confidence interval	CI
inch	in	Company	Co.	correlation coefficient	
mile	mi	Corporation	Corp.	(multiple)	R
nautical mile	nmi	Incorporated	Inc.	correlation coefficient	
ounce	oz	Limited	Ltd.	(simple)	r
pound	lb	District of Columbia	D.C.	covariance	cov
quart	qt	et alii (and others)	et al.	degree (angular)	°
yard	yd	et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	<i>E</i>
Time and temperature		(for example)	e.g.	greater than	>
day	d	Federal Information		greater than or equal to	≥
degrees Celsius	°C	Code	FIC	harvest per unit effort	HPUE
degrees Fahrenheit	°F	id est (that is)	i.e.	less than	<
degrees kelvin	K	latitude or longitude	lat. or long.	less than or equal to	≤
hour	h	monetary symbols		logarithm (natural)	ln
minute	min	(U.S.)	\$, ¢	logarithm (base 10)	log
second	s	months (tables and figures): first three		logarithm (specify base)	log ₂ , etc.
		letters	Jan,...,Dec	minute (angular)	'
Physics and chemistry				not detected	N
all atomic symbols		registered trademark	®	no data	ND
alternating current	AC	trademark	™	not significant	NS
ampere	A	United States		null hypothesis	H ₀
calorie	cal	(adjective)	U.S.	percent	%
direct current	DC	United States of		probability	P
hertz	Hz	America (noun)	USA	probability of a type I error	
horsepower	hp	U.S.C.	United States	(rejection of the null	
hydrogen ion activity	pH		Code	hypothesis when true)	α
(negative log of)		U.S. state	use two-letter	probability of a type II error	
kilowatt	kW		abbreviations	(acceptance of the null	
Kilopascal	kPa		(e.g., AK, WA)	hypothesis when false)	β
Nephelometric Turbidity Unit	NTU			second (angular)	"
parts per million	ppm			standard deviation	SD
parts per thousand	ppt,			standard error	SE
	‰			variance	
volts	V			population	Var
watts	W			sample	var

TECHNICAL REPORT NO. 26-10

PALMER PROJECT AQUATIC STUDIES, 2025

By

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July 2026

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Cover: Middle Glacier Creek sample site, facing upstream, June 10, 2025.

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Alaska Department of Fish and Game Habitat Section Habitat Biologists Nick Jensen, Claire Delbecq, and Greg Albrecht collected field samples. Claire Delbecq verified data entry of all samples, assisted in periphyton analysis, and identified benthic macroinvertebrates. Fish and Wildlife Technicians Ruth Roys and Kaylee Brown sorted benthic macroinvertebrates. Habitat Biologist Greg Albrecht provided quality assurance and control of benthic macroinvertebrate identification, reviewed and analyzed periphyton samples, and edited the report. Habitat Section Southeast Regional Supervisor Kate Kanouse reviewed and edited the report and Operations Manager Dr. Al Ott reviewed the report. Thank you all for your contribution.

EXECUTIVE SUMMARY

Constantine Mining, LLC. (Constantine) began exploratory drilling at the Palmer Exploration Project, located near Haines in Southeast Alaska in 2006, and has identified barite, copper, gold, silver, and zinc deposits within the volcanogenic massive sulfide deposit that may support a hard rock mine.

Constantine contracted with the Alaska Department of Fish and Game (ADF&G) Habitat Section to study aquatic resources in Glacier Creek, a glacial water body near the potential mine area. With Constantine, Habitat Section biologists developed and modified a study plan over time to document periphyton, benthic macroinvertebrates (BMI), fish, and sediment element concentrations at two sites in Glacier Creek (2016–2023) with the goal of documenting baseline aquatic productivity and sediment conditions, which will be useful if Constantine moves forward with a project. In 2024, we added three additional sample sites; one on Plateau Creek (a clear water tributary of Glacier Creek) and two on Sarah Creek (a nearby tributary to the Klehini River), to document conditions in water bodies proximal to the project area; we continued work at these sites in 2025.

In 2025, we sampled all sites June 10–12. Mean chlorophyll *a* density was similar among Lower Glacier Creek and both Sarah Creek sites, while Plateau Creek had the greatest mean density. Middle Glacier Creek had the lowest observed chlorophyll *a* density of all sites in 2025.

The 2025 mean BMI densities varied among sites, with Plateau Creek containing the highest density. The BMI communities in Glacier Creek were dominated by Diptera: Chironomidae insects; which generally colonize rapidly, adapt to changing habitats, and can exercise more than one feeding strategy (Entrekin et al. 2007). The BMI community composition at both Sarah Creek sites and Plateau Creek contained a greater portion of Ephemeroptera and Plecoptera insects; as expected given the differences in water quality, bedload transport, and other factors contributing to aquatic productivity, especially between glacial and non-glacial systems.

We captured and retained 35 fish across the five sites, which were analyzed for whole body concentrations of arsenic, cadmium, copper, lead, mercury, silver, selenium, and zinc. Mean concentrations were generally within the ranges observed in whole body fish samples collected from previous efforts at the Palmer Project and reference and mineral exploration sites elsewhere in Alaska (Legere and Timothy 2016).

We sampled fine sediment at each site for aluminum, arsenic, cadmium, copper, iron, lead, mercury, selenium, silver, and zinc. Mean element concentrations were generally similar among sites and within the ranges previously observed at the Glacier Creek sites. The cadmium, copper, and zinc concentrations at most sites were near or above the lower threshold for freshwater sediment guidelines suggested by Buchman (2008).

INTRODUCTION

The Palmer Exploration Project is in the Porcupine Mining District about 55 km northwest of Haines by air in the southeastern extent of the Saint Elias Mountains near the U.S./Canada border (Figure 1). Placer gold mining in Glacier Creek and its tributaries occurred during the 20th century. In 1969, local prospector Merrill Palmer discovered base-metal sulfides and barite that initiated exploration drilling programs by several companies in the following years, including Constantine beginning in 2006 (Constantine 2015) which the American Pacific Mining Corp. acquired in 2022, and Vizsla Copper Corp. acquired in November 2025.

The Palmer Prospect consists of two primary deposits: the Palmer Deposit on the south wall of the mountainside on the west side of the valley and the AG Deposit at the head of the valley under the Saksai Glacier (Figure 1). The project is located on the same volcanogenic massive sulfide belt as Greens Creek Mine on Admiralty Island, about 100 air miles south. Constantine identified barite, copper, gold, silver, and zinc as potential mineable resources (Constantine 2015). From 2014 to 2018, Constantine constructed a 6.73 km single lane gravel road to support mineral exploration on the mountainside near the Saksai Glacier face while conducting exploration activities, which continued through 2024. No exploration occurred in 2025.

Tetra Tech (2013) and ADF&G biologists documented^a Dolly Varden in Glacier Creek and three tributaries. In 2016, Constantine contracted with the ADF&G Habitat Section to conduct baseline studies in Glacier Creek. Following review of Constantine's water quality data, Habitat biologists developed a study plan to investigate and document aquatic resources in Glacier Creek. Methods and sampling design are similar to aquatic sampling programs at the Greens Creek Mine (Albrecht 2026) and Kensington Gold Mine (Timothy and Kanouse 2014), neighboring underground hard rock mines in Southeast Alaska. The study plan includes sampling periphyton, BMI, sediment, and fish—aquatic resources influenced by water and sediment quality through natural processes—to provide baseline information on aquatic productivity in Glacier Creek. We conducted these studies in spring 2016–2025; sampling results from previous years are presented in Kanouse and Legere (2016), Legere and Kanouse (2017–2018), and Krull (2019–2025). In addition, in 2024, we added three new sites in two streams that may be subject to development as part of the project, in Sarah Creek and Plateau Creek; sites Lower and Upper Sarah Creek and Plateau Creek.

PURPOSE

The purpose of this investigation and technical report is to document the baseline condition, abundance, and composition of biological communities and sediments in Glacier Creek, Sarah Creek, and Plateau Creek, which are adjacent or downstream of potential development of the Palmer Project.

^a Matthew Kern, Habitat Biologist, to Jackie Timothy, Southeast Regional Supervisor, ADF&G Division of Habitat. Memorandum: Glacier Creek investigation trip report; dated 6/26/2014. Unpublished document, can be obtained from the Southeast Regional Supervisor, ADF&G Habitat Section, 802 3rd St, Douglas, AK.

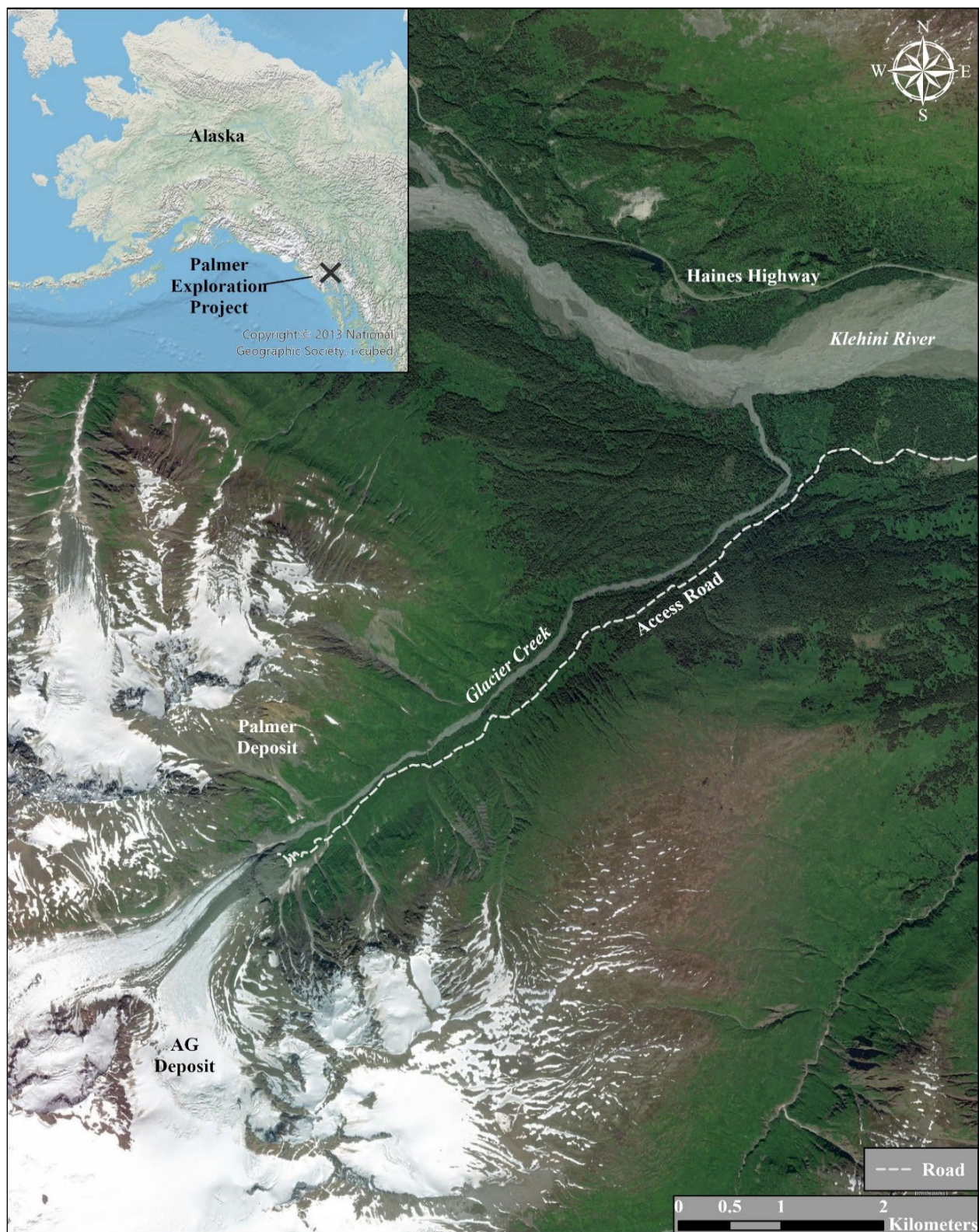


Figure 1.—Palmer Exploration Project area map.

STUDY AREA

Glacier Creek

Glacier Creek is about 7.5 km long, drains a 39 km² watershed between its headwaters at the Saksai Glacier and confluence with the Klehini River^b. It contributes about 5% of the total Klehini River drainage area, measured from the former U.S. Geological Survey gage at the Klehini River bridge—about 20 km downstream of the prospect.^c

Continuous discharge data do not exist for Glacier Creek; however, Integral Consulting, Inc.^d estimated mean Glacier Creek discharge between May and September at 150 ft³/s based on the relative size of Glacier Creek and Klehini River drainage areas. Field staff measured discharge opportunistically 2015–2018 between June and September ranging 57–471 ft³/s, with the lowest discharge measured during September. During winter, spring, and fall of 2019 and 2020, Constantine staff collected discharge measurements, 3.36–71.66 ft³/s, about 2 km upstream of the Middle Glacier Creek sampling site (A. Cairns, former Environmental Manager, Constantine Mining LLC, Vancouver, personal communication).

Constantine’s 2008–2014 and 2017–2023 Glacier Creek year-round basic water quality data documents total suspended solids ranging less than 3 mg/L to 2,470 mg/L, turbidity ranging 0.03–2,760 NTU, and pH ranging 6.59–8.33 (DOI 2016; A. Cairns, former Environmental Manager, Constantine Mining LLC, Vancouver, personal communication).

The lower 1 km of Glacier Creek (ADF&G Stream No. 115-32-10250-2077-3151) provides habitat for coho salmon *Oncorhynchus kisutch*, cutthroat trout *O. clarkii*, and Dolly Varden *Salvelinus malma* (Figure 2; Giefer and Evers 2025). We captured Dolly Varden throughout Glacier Creek while sampling fish from 2016 to 2025 during aquatic biomonitoring; we also captured several adult cutthroat trout and one rainbow trout in Lower Glacier Creek, near the Glacier Creek bridge.

Additionally, since 2019 we surveyed Lower Glacier Creek for adult fish presence in fall after water levels drop and clarity improves, observing in total three adult coho salmon within the cataloged reach and several adult Dolly Varden upstream of the Glacier Creek bridge.^e

In 2018, we captured Dolly Varden 0.1 km upstream of the Christmas Creek confluence,^f a nonglacial tributary located 4.5 km upstream of the Glacier Creek confluence with the Klehini

^b ADF&G Stream No. 115-32-10250-2077; cataloged for coho, chum, Chinook, pink, and sockeye salmon, cutthroat trout, and Dolly Varden.

^c Marcia Greenblatt and Alice Conovitz, Integral Consulting, to Darwin Green, Constantine North. Memorandum: Klehini River and Glacier Creek hydrologic data summary; dated 2/24/2016. Unpublished document, can be obtained from Constantine North, Inc., 800 W. Pender St. Ste. 320, Vancouver, BC, Canada.

^d Marcia Greenblatt and Alice Conovitz, Integral Consulting, to Darwin Green and Allegra Cairns, Constantine North. Memorandum: Klehini River and Glacier Creek hydrologic data summary–fall 2016 update; dated 12/19/2016. Unpublished document, can be obtained from Constantine North, Inc., 800 W. Pender St. Ste. 320, Vancouver, BC, Canada.

^e Dylan Krull, Habitat Biologist, to Kate Kanouse, Southeast Regional Supervisor, ADF&G Habitat Section. Memorandum: 2024 Glacier Creek Fish Survey; dated 4/4/2025. Unpublished document, can be obtained from the Southeast Regional Supervisor, ADF&G Habitat Section, 802 3rd St, Douglas, AK.

^f Previously miscalculated and reported as 0.6 km upstream of the Christmas Creek confluence.

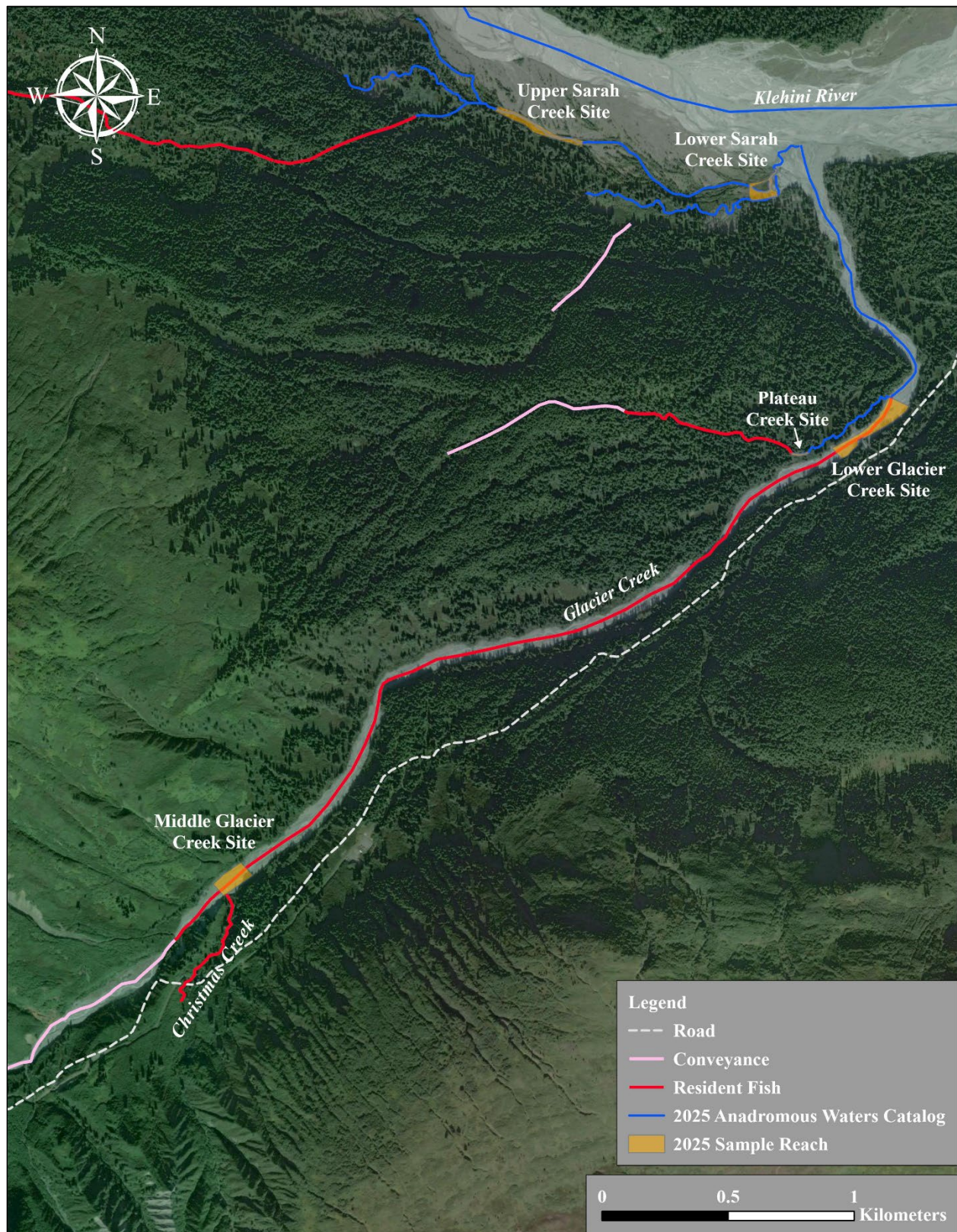


Figure 2.—Palmer Project sample site map.

River that supports resident Dolly Varden. Later in 2018, we sampled near the upper extent of Glacier Creek and captured no fish.^g

We completed aquatic biomonitoring sampling at two locations in Glacier Creek: Lower Glacier Creek and Middle Glacier Creek (Figure 2). Site locations were relatively similar since we began sampling in 2016. The fish sampling reach length varied each year due to low fish abundance.

Lower Glacier Creek Site

The Lower Glacier Creek Site is located at the Glacier Creek bridge near 230 m elevation, about 1.5 km upstream of the Klehini River (Table 1; Figures 3, 8). We accessed the site from the bridge crossing at the end of Porcupine Road.

Table 1.–2025 Lower Glacier Creek waypoints (WGS 84).

	Latitude	Longitude
Upper extent	59.4169	-136.3029
Lower extent	59.4189	-136.2988

Lower Glacier Creek is classified as a medium glacial outwash channel type, which exhibits high rates of aggradation and scour, resulting in active channel migration throughout the floodplain (Paustian 2010). Comparing stream characteristics of the Lower Glacier Creek sample site 2016–2025, we observed different main channel courses and channel braids each year. During sampling in 2025, flow was partitioned into two braids in the center of the floodplain that joined at the bridge. Downstream of the bridge, the channel split into two braids, with one braid flowing along the river left bank with overhanging alders and the other flowing towards the river right side of the floodplain; the sediment basin downstream of the bridge constructed in 2023 was filled. Streambed gradient ranges 3–6% and the substrate is composed of cobble, gravel, sand, and silt.

In 2025, we collected periphyton, BMI, fish, and sediment samples in a 60 m reach of the dominant channel braid on river right and along the main channel margin upstream of the bridge. We collected fish upstream and downstream of the bridge in a 325 m reach.

^g Dylan Krull, Habitat Biologist, to Jackie Timothy, Southeast Regional Supervisor, ADF&G Division of Habitat. Memorandum: Waterfall and Hangover Creeks fish investigations; dated October 22, 2018. Unpublished document, can be obtained from the Southeast Regional Supervisor, ADF&G Habitat Section, 802 3rd St, Douglas, AK.



Figure 3.–Lower Glacier Creek, looking downstream from bridge.

Middle Glacier Creek Site

The Middle Glacier Creek Site is located near 350 m elevation, about 4.5 km upstream of the Klehini River (Table 2; Figures 4, 10) and was accessed by foot.

Table 2.–2025 Middle Glacier Creek waypoints (WGS 84).

	Latitude	Longitude
Upper extent	59.4005	-136.3449
Lower extent	59.4013	-136.3432

Middle Glacier Creek is characterized as a transitional zone between a cirque channel and a medium glacial outwash channel type; both classifications are within the glacial outwash process group and contain high sediment loads causing lateral channel migration and stream braiding (Paustian 2010). Streambed gradient ranges 4–8% and the substrate is composed of cobble, gravel, sand, and silt, resulting in large amounts of bedload movement. We observe different main channel courses and channel braids each year at Middle Glacier Creek, a common trait in both channel types. In 2025, the main channel flowed largely in the center of the floodplain and the river left side of the floodplain. Christmas Creek joined the main channel after flowing about 50 m in the Glacier Creek floodplain.

On June 10, 2025, we collected periphyton, BMI, and sediment samples in channel braids and along the main channel margin near the Christmas Creek confluence and fished a 150 m sample reach downstream from the Christmas Creek confluence.



Figure 4.—Middle Glacier Creek sampling site, facing downstream.

Sarah Creek

Sarah Creek^h is about 6.4 km long, drains a 10.4 km² watershed between its headwaters at an unnamed glacier east of the Little Jarvis Glacier and flows down a steep south facing slope where it joins the Klehini River floodplain (DOI 2016). While Sarah Creek is glacially fed in part, it runs clearer than neighboring glacial streams. The stream is accessible to anadromous fish for 1.85 km where the channel flows in the historical Klehini River floodplain; upstream of the floodplain, a cascade barrier that exceeds 39% gradient for 135 ft prevents upstream fish migration.ⁱ Upstream of the barrier, the stream supports resident Dolly Varden for at least 1.7 km. Published water quality and discharge data do not exist for Sarah Creek.

Since 2024, we completed aquatic biomonitoring sampling at two locations in Sarah Creek: Lower Sarah Creek and Upper Sarah Creek which are both within the reach accessible by anadromous fish and within the historical Klehini River floodplain (Figure 2).

^h ADF&G Stream No. 115-32-10250-2077-3159; cataloged for coho salmon.

ⁱ Gordan Willson-Naranjo, Habitat Biologist, to Jackie Timothy, Southeast Regional Supervisor, Sarah Creek Survey Haines, dated May 5, 2015. Unpublished document, can be obtained from the Southeast Regional Supervisor, ADF&G Habitat Section, 802 3rd St, Douglas, AK.

Lower Sarah Creek Site

The Lower Sarah Creek Site is located about 50 m upstream of the confluence with the Klehini River (Table 3; Figures 5, 9) and was accessed by foot.

Table 3.—2025 Lower Sarah Creek waypoints (WGS 84).

	Latitude	Longitude
Upper Extent	59.4180	-136.3005
Lower Extent	59.4276	-136.3216

Lower Sarah Creek is characterized as a small floodplain channel type (Paustian 2010). Within the sample reach, stream gradients range 1–2 % and the substrate is composed of gravel underlain with sand. At the upper extent of the sample reach, an unnamed stream^j enters Sarah Creek from the south. This stream includes a beaver pond complex just upstream of the confluence with Sarah Creek. Based on potential mine development plans, it is possible that the headwaters of this stream will be near infrastructure (Constantine North Inc. 2024). About 100 m upstream of the sampling reach, two distinct braids of Sarah Creek join.

On June 11, 2025, we collected periphyton, BMI, and sediment samples near the confluence with the Klehini River. We used a backpack electrofisher and set minnow traps baited with disinfected salmon eggs, focusing on the southern braid and within Stream No. 115-32-10250-2077-3155.



Figure 5.—Southern braid, facing downstream.

^j ADF&G Stream No. 115-32-10250-2077-3155; cataloged for coho salmon.

Upper Sarah Creek Site

The Upper Sarah Creek Site is located about 800 m upstream of the Lower Sarah Creek site near the portion of the stream that flows from the forest to the Klehini River floodplain (Table 4; Figures 6, 9). We accessed the site by foot.

Table 4.—2025 Upper Sarah Creek waypoints
(WGS 84).

	Latitude	Longitude
Upper Extent	59.4287	-136.3277
Lower Extent	59.4276	-136.3216

Like the Lower Sarah Creek Site, the Upper Sarah Creek Site is characterized as a small floodplain channel type (Paustian 2010). Within the sample reach, stream gradients were 1–3% and the substrate was composed of gravel underlain with sand. We chose this site due to the proximity of the Lower Sarah Creek site and its location above potential project development influences, and its similarity in reach characteristics to the Lower Sarah Creek Site; both are likely a relic channel from the Klehini River given the cobble and large gravel substrate.

On June 11, 2025, we collected periphyton, BMI, and sediment in a 50 m reach at the downstream end of the sampling reach, and fish samples from a 375 m reach which extended upstream.



Figure 6.—Downstream extent of Upper Sarah Creek sample site, facing upstream.

Plateau Creek

Plateau Creek^k originates from an unnamed mountainside on the east-facing slope of the Glacier Creek valley and flows through a moderate gradient plateau from about 457 m to 365 m elevation over 1.6 km (5.75% gradient on average). At around 365 m elevation the gradient steepens to approximately 17% for 0.8 km then maintains 3–5% gradient channel parallel to Glacier Creek for 480 m to its confluence. There is little information about Plateau Creek discharge and water quality; Constantine’s consultant Integral Consulting measured streamflow in Plateau Creek near the aquatic biomonitoring site on August 7, 2015, at 0.25 ft³/s and on July 1, 2016, at 0.52 ft³/s. No other streamflow data are available.

In 2024, we initiated aquatic biomonitoring sampling at one location in the lower reach of Plateau Creek, accessible to anadromous fish (Figure 2).

Plateau Creek Site

The Plateau Creek Site is located about 450 m upstream of the confluence with the Glacier Creek (Table 5; Figures 7, 8). We accessed the site from the Glacier Creek bridge.

Table 5.–2025 Plateau Creek waypoints (WGS 84).

	Latitude	Longitude
Upper Extent	59.4169	-136.3061
Lower Extent	59.4169	-136.3049

Plateau Creek, at the sample site, is classified as a small flood plain channel type; the reach is situated at the transition between the small flood plain channel and a small moderate gradient channel type (Paustian 2010). Within the sample reach, stream gradients were 2–5% and the substrate was composed of gravel underlain with sand; wood was common throughout the reach and resulted in the formation of pools and riffles. We selected this reach due to its long-term stability; about 40 m down from the upstream extent of the reach, the stream flows within about 5 m from the active Glacier Creek floodplain, separated by a natural gravel berm, which could erode and abandon Plateau Creek downstream.

On June 11, 2025, we collected periphyton, BMI, and sediment samples within the upper 40 m of the sampling reach. We captured all fish downstream of the periphyton, BMI, and sediment reach.

^k ADF&G Stream No. 115-32-10250-2077-3151-4010; cataloged for coho salmon, cutthroat trout, and Dolly Varden.



Figure 7.—Upper extent of sampling reach, facing downstream.

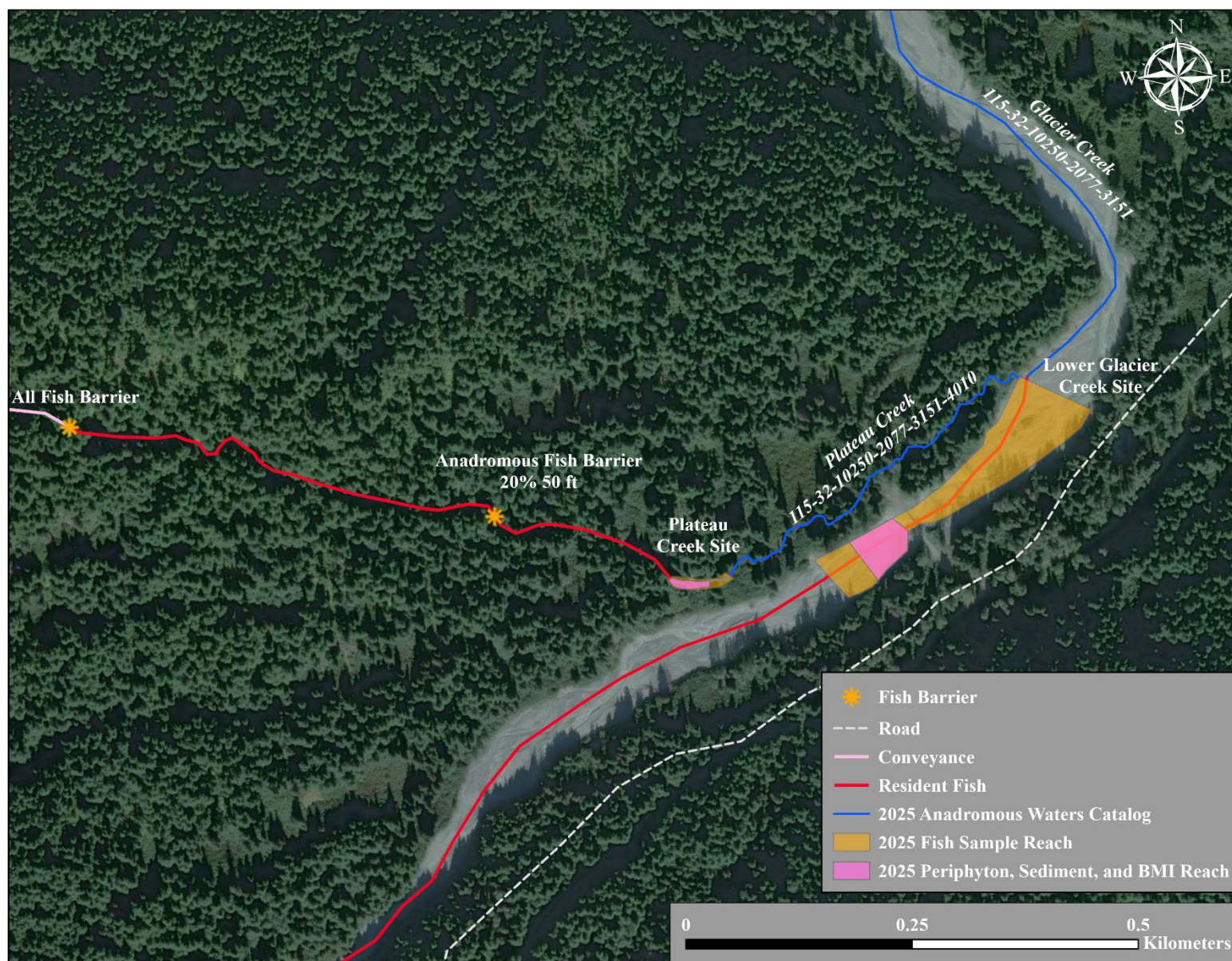


Figure 8.—Lower Glacier Creek and Plateau Creek sites map.

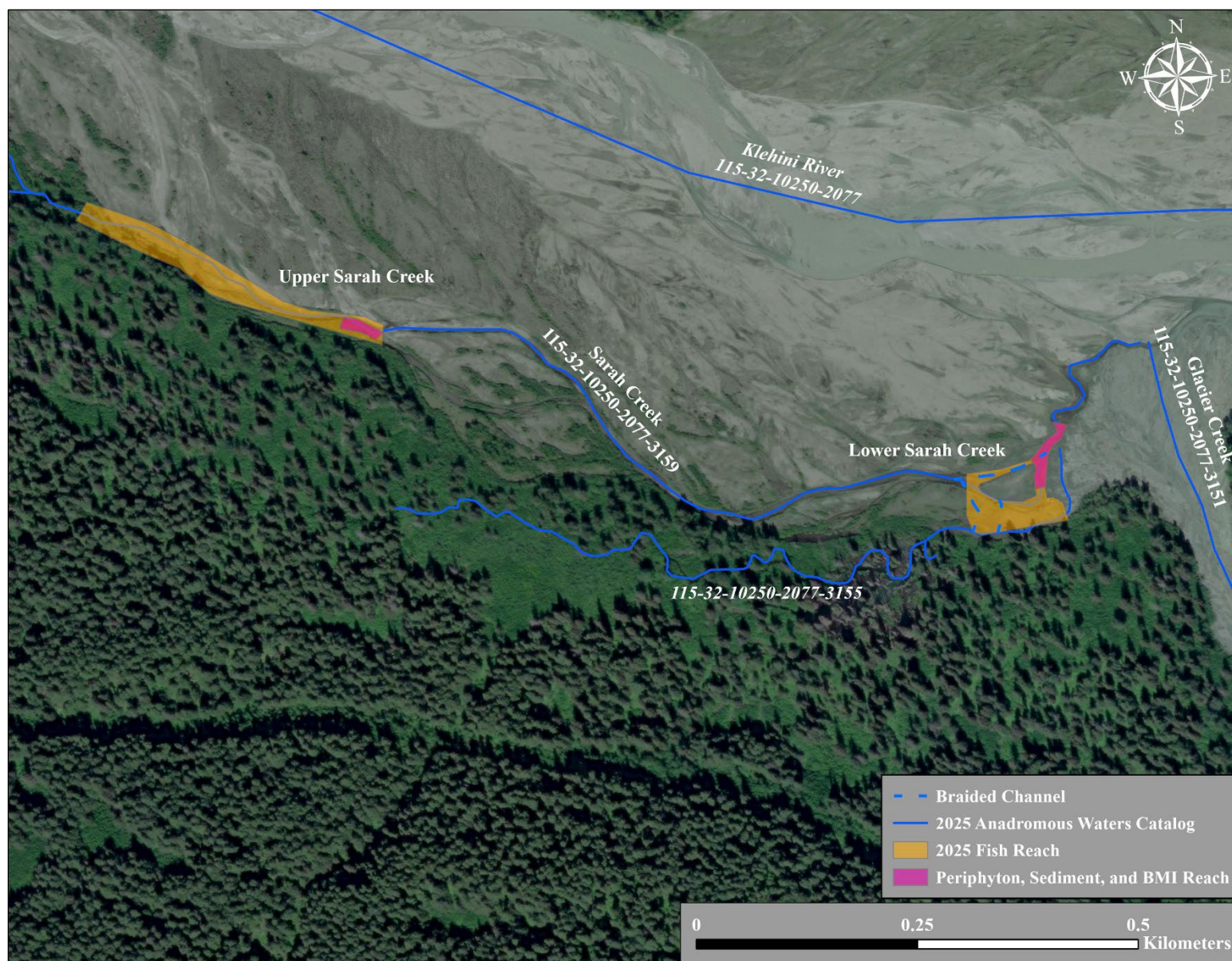


Figure 9.—Lower and Upper Sarah Creek sites map.



Figure 10.—Middle Glacier Creek Site map.

AQUATIC STUDIES

We completed the following studies at Lower Glacier Creek, Middle Glacier Creek, Lower Sarah Creek, Upper Sarah Creek, and Plateau Creek.

Chlorophyll Density and Composition

Periphyton is composed of primary producing organisms, such as algae, cyanobacteria, heterotrophic microbes, and detritus attached to the submerged surfaces of aquatic ecosystems. Algal density and community structure are influenced by water and sediment characteristics through physical, chemical, and biological factors, and disturbances that change throughout the year (Barbour et al. 1999).

Periphyton was collected at all sites to estimate algal density and community composition at each site, using concentrations of chlorophylls *a*, *b*, and *c*. The concentration of chlorophyll-*a* (Chl-*a*) pigment in periphyton samples provides an estimate of active algal biomass (density), while concentrations of chlorophyll-*b* (Chl-*b*) and chlorophyll-*c* (Chl-*c*) pigments estimate the composition of algal organisms present, such as green algae that produce Chl-*b*, and diatoms and brown algae that produce Chl-*c*. The chlorophyll data are used to document baseline primary productivity (e.g., live algal biomass).

Benthic Macroinvertebrate Density and Community Composition

BMI classified in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), collectively known as EPT taxa, have complex life cycles and include genera sensitive to changes in water and sediment quality (Barbour et al. 1999). These organisms are secondary producers, feed on periphyton and other macroinvertebrates, and provide a food source for fish.

Fish Condition and Whole Body Element Concentrations

Element bioavailability and bioaccumulation depends on physical and chemical factors and interactions among biological communities (Tchounwou et al. 2012). Resident fish samples were analyzed for whole body concentrations of silver (Ag), arsenic (As), cadmium (Cd), copper (Cu), mercury (Hg), lead (Pb), selenium (Se), and zinc (Zn) to document baseline concentrations and variability. These elements were selected based on Constantine's Glacier Creek water sample data and potential target elements identified in the ore body.

Sediment Composition and Element Concentrations

Sediment element concentrations are influenced by a variety of factors, such as geochemical composition and weathering within the watershed, sediment grain size, organic content, and development/disturbance (Tchounwou et al. 2012). Subsequently, sediment element concentrations influence aquatic productivity, and heavy metals in sediments can decrease BMI taxa richness and alter the composition of BMI communities (Qu et al. 2010). Fine sediments were sampled at all sample sites for total concentrations of Ag, aluminum (Al), As, Cd, Cu, iron (Fe), Hg, Pb, Se, and Zn to document baseline conditions and variability. These elements were selected based on Constantine's Glacier Creek water sample data and potential target elements identified in the ore body.

METHODS

We review data sets annually to ensure accuracy and consistency with modifications to methods; corrections and updates are reported in the document and appendices. The most recent technical report presents the current data sets and should be used to analyze data from previous years.

WATER QUALITY

Basic water quality data were collected with a Hanna HI98194 multimeter and a Hanna HI98703 Portable Turbidimeter; both instruments were calibrated per the manufacturer's instructions prior to sampling.¹ Data are provided in Appendix A.

PERIPHYTON: CHLOROPHYLL DENSITY AND COMPOSITION

Sample Collection and Analysis

Sampling methods are adapted from Barbour et al. (1999). Ten smooth, flat, undisturbed, and perennially wetted rocks were collected from submerged cobble in riffle habitats in less than 0.45 m water depth at each sample site, and submerged in the creek in the same orientation they were collected. To collect a sample from each rock, a 5 × 5 cm square of high-density foam was held on the sample area; the area around the foam was scrubbed with a toothbrush to remove algae and other organisms outside the sample area. The rock was rinsed by submerging it in the stream while holding the foam in place; the toothbrush also was rinsed in the stream, and between samples.

A 47 mm diameter Type A/E 1 µm glass fiber filter was placed into a Nalgene® filter receptacle attached to a vacuum pump with a gauge. The foam square was removed and the underside of the foam and the sample area were gently scrubbed in a circular pattern with the toothbrush into the filter receptacle. Stream water in a wash bottle was used to rinse loosened periphyton from the foam, sample area of the rock, toothbrush, and the inside of the filter receptacle onto the filter. The toothbrush was rinsed inside the receptacle, and the sample area was scrubbed a second time and the rinse cycle was repeated. With most of the water pumped through the filter, maintaining pressure less than 34 kPa, a few drops^m of saturated magnesium carbonate solution was added to the filterⁿ before the sample was pumped dry. The glass fiber filter was removed from the receptacle, folded in half with the sample inside, and wrapped in a white coffee filter for additional moisture absorption. The samples were placed in a sealed, labeled plastic bag with desiccant and stored in a light-proof cooler containing frozen icepacks during transportation; samples were stored in a -20°C freezer in the ADF&G Douglas laboratory until processing.

U.S. Environmental Protection Agency (EPA; 1997) protocol was followed for chlorophyll extraction and measurement, determining instrument and estimated detection limits, and data analysis.^o Samples were removed from the freezer, cut into small pieces, and placed into individual 15 mL screw cap centrifuge tubes containing 10 mL of 90% buffered acetone. The centrifuge tubes

¹ At the first sampling site, Middle Glacier Creek, we suspected an error in the pH measurement of multi-meter due to low value, which was discarded. Upon returning to the hotel, the unit was recalibrated for pH and values for the remaining sites normalized.

^m This measurement is not exact as the amount of water and MgCO₃ used to create a saturated solution varies and does not affect sample integrity; supernatant solution was used to avoid MgCO₃ solids.

ⁿ To prevent acidification and conversion of chlorophyll to phaeophytin.

^o Deviations from EPA (1997) include sample storage longer than 3.5 weeks, and cutting sample filters to reduce acetone exposure for laboratory staff (as opposed to homogenization).

were capped and shaken to ensure complete submersion of the sample. Secured in a vial rack covered with aluminum foil, to reduce the potential for light exposure, the samples were stored in a refrigerator for 12–24 hours to allow for saturation and chlorophyll extraction.

In a dimly-lit laboratory, we removed the samples from the refrigerator and centrifuged for 20 min at 500 relative centrifugal force. Prior to sample measurement, two cuvettes containing 90% buffered acetone were placed into a Shimadzu UV-1800 spectrophotometer to calibrate absorbance of the solvent at wavelengths 664 nm, 647 nm, 630 nm, and 750 nm. Each sample supernatant was decanted into an individual cuvette and absorbance was measured at each wavelength. Each sample was treated with 80 μ L of 0.1 N hydrochloric acid for 90 seconds to convert the chlorophyll to phaeophytin, and absorbance was measured at wavelengths 665 nm and 750 nm. To minimize stray light and improve resolution, sample cuvettes were cleaned with a nonabrasive wipe prior to placement in the spectrophotometer.

Trichromatic equations were used to estimate Chl-*a*, Chl-*b*, and Chl-*c* concentrations, correcting for turbidity using the 750 nm absorbance value (APHA 2012, EPA 1997). Chl-*a* concentrations were corrected when phaeophytin was detected. When Chl-*a* was not detected in a sample, the concentration is reported as the spectrophotometer estimated detection limits and the values for Chl-*b* or Chl-*c* are excluded. When Chl-*a* exceeds the upper detection limit, the value is reported at the upper detection limit and the Chl-*b* or Chl-*c* are reported as calculated. The 2025 estimated detection limits for Chl-*a* concentration were 0.23 mg/m² – 115.00 mg/m². In the last report (Krull 2025) the upper level of the Chl-*a* was incorrectly reported; the 2024 upper detection limit is 109.49, not 27.37, which impacted 4 samples, all in Plateau Creek. The values have been corrected in this report. Additional information on periphyton methods and calculations can be found in Bradley (2017).

Data Presentation

For each site and by year, mean densities of Chl-*a*, Chl-*b*, and Chl-*c* are presented in a table. Chl-*a* sample densities and mean proportions of Chl-*a*, Chl-*b*, and Chl-*c* are presented in figures. A comparison of mean densities of Chl-*a* among sites is also presented in a figure. The 2016–2025 sample data are provided in Appendix B.

BENTHIC MACROINVERTEBRATE DENSITY AND COMMUNITY COMPOSITION

Sample Collection and Analysis

Six BMI samples were collected from each site using a Surber stream bottom sampler in riffles and runs with gravel and cobble substrate and varying flow velocities—habitats that support greater BMI densities and taxonomic richness (Barbour et al. 1999). Other habitat types (e.g., pools) were excluded to reduce data variability.

The Surber stream bottom sampler has a 0.093 m² sample area and material is captured in a 200 mL cod end, constructed with 300 μ m mesh net. After securing the frame on the streambed with the opening facing upstream, rocks within the sample area were scoured with a scrub brush; gravel, sand, and silt were disturbed to about 10 cm depth to dislodge macroinvertebrates into the net. If the contents of the sample exceeded the capacity of the cod end, the sample was discarded and repeated at a new location. The net was rinsed in the stream to ensure all organisms drifted into the cod end, and each sample was transferred from the cod end to a labeled 500 mL plastic bottle. Samples were preserved in 95% ethanol at a ratio of three parts ethanol to one part sample.

We used an elutriator system with a 300 µm sieve to sort macroinvertebrates from debris^p and identified organisms to the lowest practical taxonomic level^q using Merritt and Cummins (1996) and Stewart and Oswood (2006). For quality control, other staff verified BMI enumeration for three sample results (more than 10% of the total number of samples).

The BMI density (per m²) was calculated for each sample by dividing the number of macroinvertebrates by 0.093 m²—the Surber sampling area. Mean density was estimated for each site by calculating the mean density among the six samples. Taxa richness is reported as the number of taxonomic groups identified to the lowest practical level; terrestrial^r organisms were excluded from all calculations.

Data Presentation

For each site and by year, a table is presented summarizing mean BMI density, total taxa, total EPT taxa, percent EPT insects, and percent Chironomidae insects. BMI densities and community composition are illustrated in figures and BMI density and taxa richness data comparisons among sites are also presented. The 2025 sample data and the 2016–2025 data summaries are provided in Appendix C.

RESIDENT FISH CONDITION

Age, sex, season, maturation, diet, stomach contents, fat reserve, and muscular development affect fish condition. Length and weight data were used to assess fish condition—an index of fish health.

Sample Collection and Analysis

Wearing nitrile gloves, we recorded sample fish FL to the nearest 1 mm and weight to the nearest 0.1 g. Fulton’s condition factor (K) was calculated using the equation given in Anderson and Neumann (1996), where the weight (W) of each fish is divided by the cubed length (L), and the product multiplied by 100,000:

$$K = \frac{W}{L^3} \times 100,000$$

Data Presentation

For each site the mean fish condition factor of fish samples are presented and compared among sites; 2016–2025 data are provided in Appendix D.

^p Claire Delbecq, Habitat Biologists, to Kate Kanouse, Southeast Regional Supervisor, ADF&G Habitat Section. Memorandum: Region 1 BMI Elutriation Methods; dated 2/4/2026. Unpublished document can be obtained from the ADF&G Habitat Section, 802 3rd St, Douglas, AK.

^q Insects of the orders Ephemeroptera, Plecoptera, Trichoptera, and Diptera to genus, except nonbiting midges to family Chironomidae, and all others to class or order. Damaged and degraded organisms that cannot be identified are not reported.

^r Including adult terrestrial insects of the orders Ephemeroptera, Plecoptera, Trichoptera, and Diptera.

RESIDENT FISH ELEMENT CONCENTRATIONS

Sample Collection and Analysis

Fish were collected using a Smithroot LR-24 backpack electrofisher.^{s,t} The target size range for sample retention of whole body fish was 75–122 mm FL, similar to other methods used in Southeast Alaska (Timothy and Kanouse 2014, Legere and Timothy 2016, Albrecht 2026). A 75 mm fish provides the minimum weight requirement for laboratory testing, while a 130 mm fish is 2–3 years old and young enough to reasonably conclude it is resident due to sampling timing and location—about 60 km upriver from Chilkat Inlet.

Due to general scarcity of fish at both Glacier Creek sample sites, all fish captured were retained as samples regardless of size between 2016 and 2019; the sampling reach extent also was contingent on capture efforts each year. In 2020, we discontinued submitting composite samples of smaller fish due to dilution needed to process samples at the lab resulting in greater method reporting limits. In some years, we retained larger fish to obtain a minimum of five samples per site. In some years we were unable to capture the required samples due to low fish density.

Wearing nitrile gloves, each fish was placed in an individually labeled plastic bag. During transport, samples were stored in a cooler with frozen icepacks and in a freezer while onsite. At the ADF&G Douglas laboratory, FL and weight were measured in the sample bags, correcting for bag weight. Samples were stored in a -20°C freezer in the lab until shipped to the lab for analysis.

In 2026, samples were shipped to the Alaska Department of Environmental Conservation (ADEC) Environmental Health Laboratory (EHL) in Anchorage, AK, in a cooler with frozen icepacks via overnight freight, maintaining written chain of custody documentation.^u The lab measured total concentrations of Ag, As, Cd, Cu, Hg, Pb, Se, and Zn in each sample on a wet-weight basis, following EPA (1998) method 7473 for Hg, American Public Health Association (1992) method 2540 G for solids, and EPA (1998) method 6020A^v for the other elements. Wet-weight data was converted to dry-weight basis by dividing by percent solids and divided by 100:

$$\text{Dry weight} = \text{wet weight} / (\text{percent solids}/100)$$

The laboratory provided Tier IV quality control information including results for sample duplicates, matrix spikes, standard reference materials, and blanks^w. Results were published in wet weight, historically this project has presented dry weight of element concentrations; therefore we converted to dry weight by dividing wet weight concentration by the decimal form of the percent solids and used those values for the report, including the method reporting limits.

Data Presentation

For each site and by year, fish whole body elements concentrations are presented in a figure; comparisons of element concentrations data among sites are also presented. A table with the raw

^s In 2016 and 2019, baited minnow traps also were used to capture fish in Lower Glacier Creek.

^t In 2017, 2018, 2020, and 2024 only six samples were retained from Middle Glacier Creek; in 2022 only one sample; in 2021 and 2023 only five samples and were retained due to scarcity of fish.

^u In previous years, we sent samples to ALS in Kelso, WA which used EPA (2002) method 1631E for Hg.

^v In 2016, 2018, and 2019, the same lab used EPA method 200.8 (EPA 1994).

^w In 2025, one batch of fish samples from the lab detected a trace amount of Cu in the laboratory blank, values from this batch were still comparable to others when graphed and included in the report.

data, presenting the mean value for duplicate sample results and 2025 laboratory report are provided in Appendix D.

To differentiate fish species in the graphs, juvenile coho salmon are represented by triangle (▲), cutthroat trout represented by a diamond symbol (◆), and Dolly Varden by a circle (●). To avoid misrepresenting sample results below method reporting limits as whole body elements concentrations data, element concentrations undetected are illustrated as an empty marker (°) at the method reporting limit, while measured element concentrations are illustrated as a solid circle (●).^x

SEDIMENT ELEMENT CONCENTRATIONS

Sample Collection and Analysis

Wearing nitrile gloves, five samples of submerged sand and silt were collected within actively flowing channels. For each sample, the top 4 cm of sediment was retained in glass jars provided by the laboratory for element analyses and plastic bags for particle size analyses. Samples were stored in a cooler with frozen icepacks in the field and in a camp refrigerator. On June 16, 2025, Habitat Section staff sent the sediment samples in coolers with ice packs, via overnight shipping with FedEx to ALS Environmental in Kelso, Washington. Samples arrived on June 18, 2026.

ALS Environmental measured total Ag, Al, As, Cd, Cu, Fe, Hg, Pb, Se, and Zn concentrations on a dry-weight basis using methods listed in Table 6.^y The laboratory provided quality control results for laboratory controls and blanks. Total organic carbon and acid volatile sulfide were not analyzed in 2025, which was a laboratory mistake.

Table 6.—2025 sediment tests, analytes, and methods.

Test Description	Analyte	Method
Particle size distribution	Particle size determination	ASTM D422-63e
Total Solids	Solids	EPA 160.3 (mod)
Mercury in soil	Hg	EPA 1631E
Sulfide, acid volatile	Acid volatile sulfides	EPA 821/R-91-100 (mod)
Metals in soil by CRC ICPMS	Ag, Al, As, Cd, Cu, Fe, Pb, Se, and Zn	EPA 6020B

Data Presentation

For each site and by year, sediment element concentrations data are presented in a figure; mean values are reported when sample duplicate data are available. Consistent with the whole body fish element concentration data presentations, sediment element concentrations undetected are illustrated as an empty circle (°) at the method reporting limit and a solid circle (●) for measured element concentrations. Acid volatile sulfides were not detected in any sample.

The data are compared with the threshold effects concentrations (TEC) and the probable effects concentrations (PEC) for inorganics in freshwater sediment guidelines developed by the National

^x In 2024, MRL limits were mistakenly reported as wet weight. The values in this report are corrected to dry weight from 2024.

^y The 2016 Glacier Creek sediment samples were processed by an ALS Environmental lab in Kelso, WA. In 2017–2024, Constantine sent the sediment samples to a different ALS lab in Whitehorse; though methods used by each lab were different, the results are comparable. The parameters analyzed were different between labs; data comparisons between years are presented where applicable.

Oceanic and Atmospheric Administration (Buchman 2008). The guidelines are based on results of controlled laboratory bioassays, where element concentrations below the TECs rarely affect aquatic life survival and growth, and element concentrations above the PECs can affect aquatic life survival and growth.

Sediment element concentration data are also compared among sites and presented as a figure. Appendix E contains the 2016–2025 composition and raw element data in a table and the 2025 laboratory reports.

RESULTS

GLACIER CREEK

Lower Glacier Creek Site

We sampled Lower Glacier Creek on June 12, 2025, and collected periphyton, BMI, fish, and sediment samples and measured basic water quality at 1100 hours (Table 7).

Table 7.—Lower Glacier Creek water quality data.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/12/2025	4.67	13.7	247	160	7.87

Periphyton: Chlorophyll Density and Composition

The Lower Glacier Creek mean Chl-*a* density was 6.54 mg/m², the greatest mean density recorded at this site (Table 8; Figure 11). The samples contained about 88% Chl-*a*, 12% Chl-*c*, and 0% Chl-*b* (Figure 12). Chl-*b* was not detected in any samples.

Table 8.—Lower Glacier Creek mean chlorophylls *a*, *b*, and *c* densities.

Sample Date	Chl- <i>a</i> (mg/m ²)	Chl- <i>b</i> (mg/m ²)	Chl- <i>c</i> (mg/m ²)
6/7/2016	2.27 ± 1.07	0.00	0.35
6/8/2017	1.73 ± 0.89	0.00	0.26
5/30/2018	1.25 ± 1.09	0.02	0.24
6/6/2019	0.43 ± 0.56	0.01	0.04
6/3/2020	3.91 ± 3.03	0.00	0.47
6/16/2021	0.77 ± 0.83	0.02	0.24
6/13/2022	1.85 ± 1.63	0.00	0.39
6/7/2023	5.51 ± 1.75	0.00	0.69
6/19/2024	0.50 ± 0.55	0.00	0.06
6/12/2025	6.54 ± 3.68	0.00	0.90

Note: Chl-*a* mean density ± 1 SD.

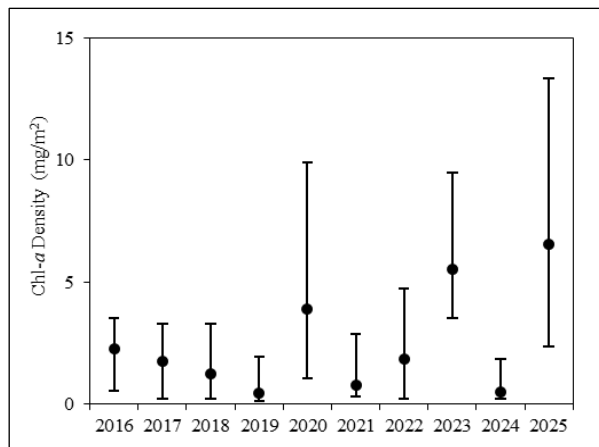


Figure 11.—Lower Glacier Creek Chl-*a* densities.
Note: Minimum, mean, and maximum values shown.

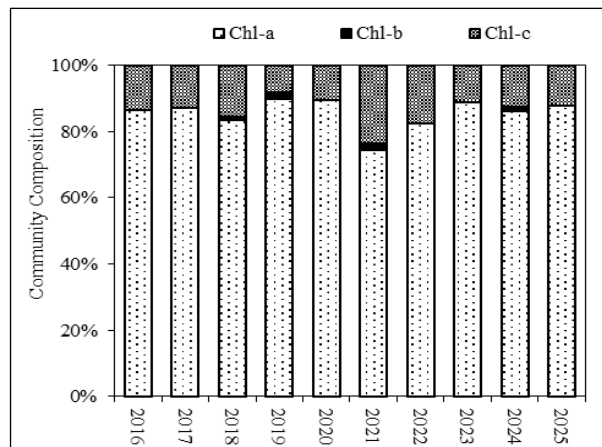


Figure 12.—Lower Glacier Creek mean proportions of chlorophylls *a*, *b*, and *c*.

Benthic Macroinvertebrate Density and Community Composition

Among the 2025 Lower Glacier Creek BMI samples, we identified 17 taxa and estimated mean density at 516 BMI/m², of which 36% were EPT insects (Table 9; Figures 13, 14). Like previous years, the dominant taxon was Diptera: Chironomidae, representing 61% of the samples.

Table 9.–Lower Glacier Creek BMI data summaries.

	6/7/2016	6/8/2017	5/30/2018	6/6/2019	6/3/2020	6/16/2021	6/13/2022	6/7/2023	6/3/2024	6/12/2025
Mean BMI density (per m ²)	995	2,136	217	473	754	396	1,136	3,462	1,208	516
Total BMI taxa	17	30	16	12	25	26	30	12	27	17
Number of EPT taxa	9	13	10	5	12	12	14	9	11	11
Proportion of EPT insects	10%	17%	69%	30%	19%	27%	21%	15%	30%	36%
Proportion of Chironomidae insects	85%	78%	26%	67%	74%	58%	71%	85%	67%	61%

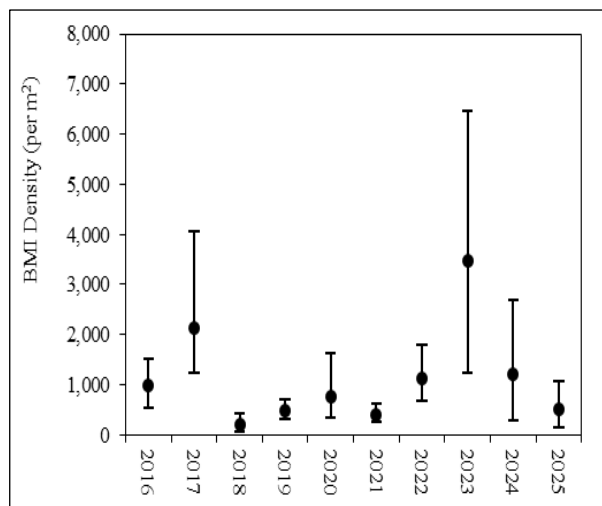


Figure 13.–Lower Glacier Creek BMI densities.
Note: Minimum, mean, and maximum values shown.

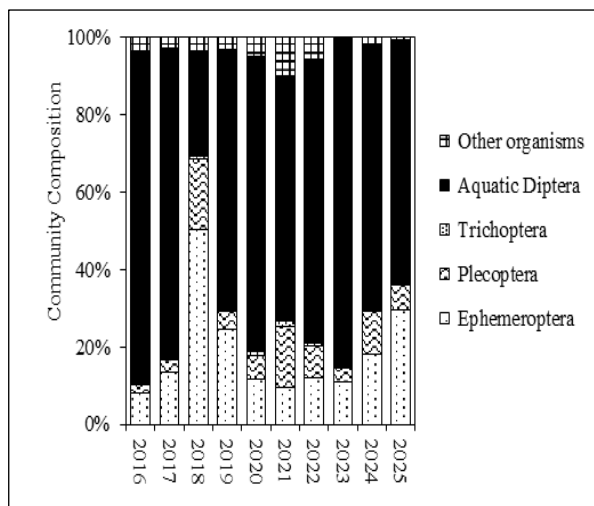


Figure 14.–Lower Glacier Creek mean BMI community compositions.

Resident Fish Condition and Element Concentrations

Of the ten individual whole body Dolly Varden (75–122 mm FL) samples we retained from Lower Glacier Creek in 2025, mean fish condition was 1.1. Whole body element concentrations were generally within the ranges of values previously observed.(Figure 15).

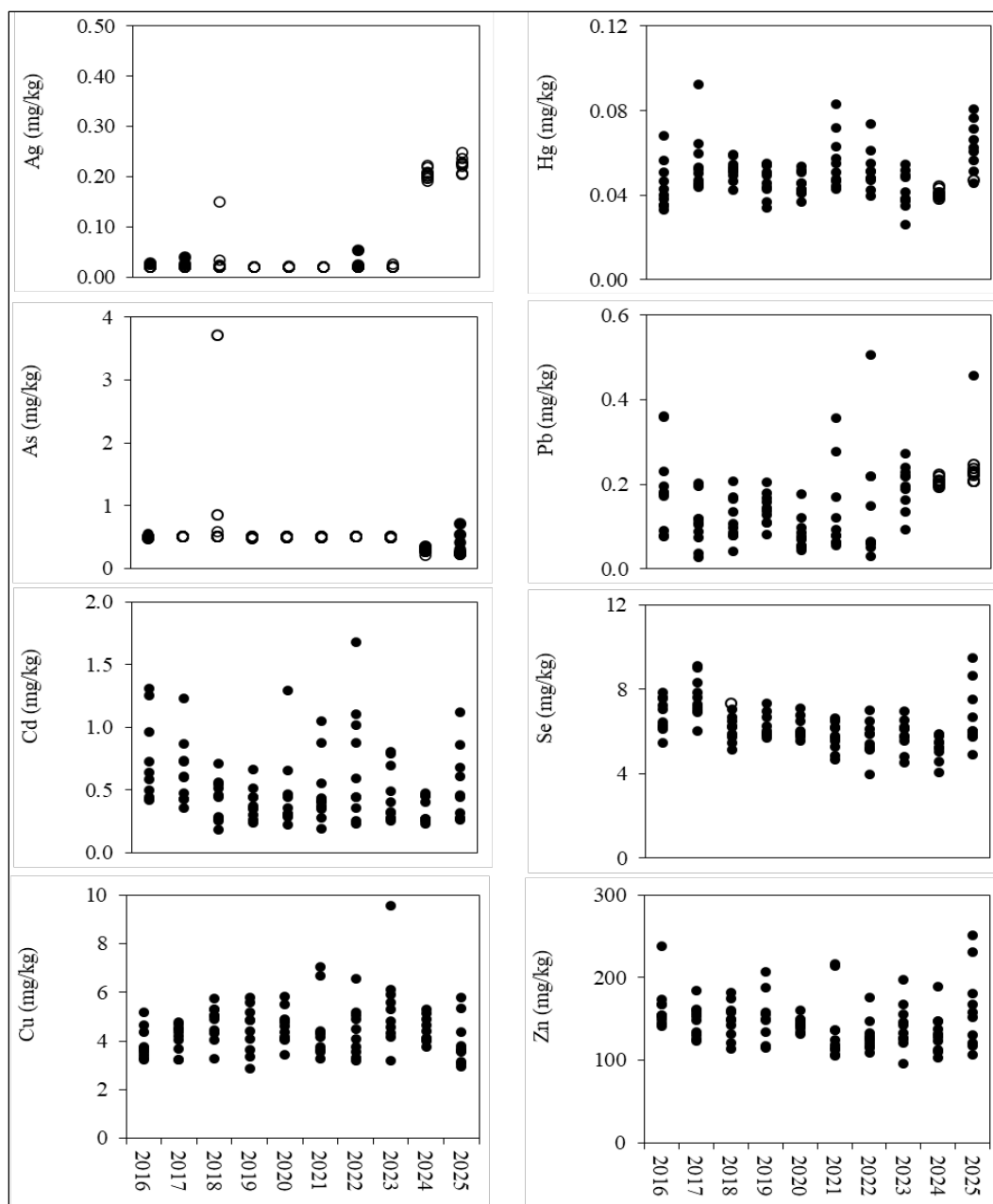


Figure 15.—Lower Glacier Creek whole body Dolly Varden element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit.

Sediment Composition and Element Concentrations

The 2025 Lower Glacier Creek sediment samples included particle sizes less than 9.5 mm, with the majority under 1 mm. The predominant elements were Fe and Al, and the 2025 element concentrations generally were like the 2016–2024 results though Cu concentration was elevated in one sample compared to previous years (Figure 16).

We evaluated the 2025 sediment sample element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and—like the 2016–2024 results—we found Cd, Cu, and Zn concentrations near or above the TEC values, and As, Hg, and Pb concentrations below the TEC values.

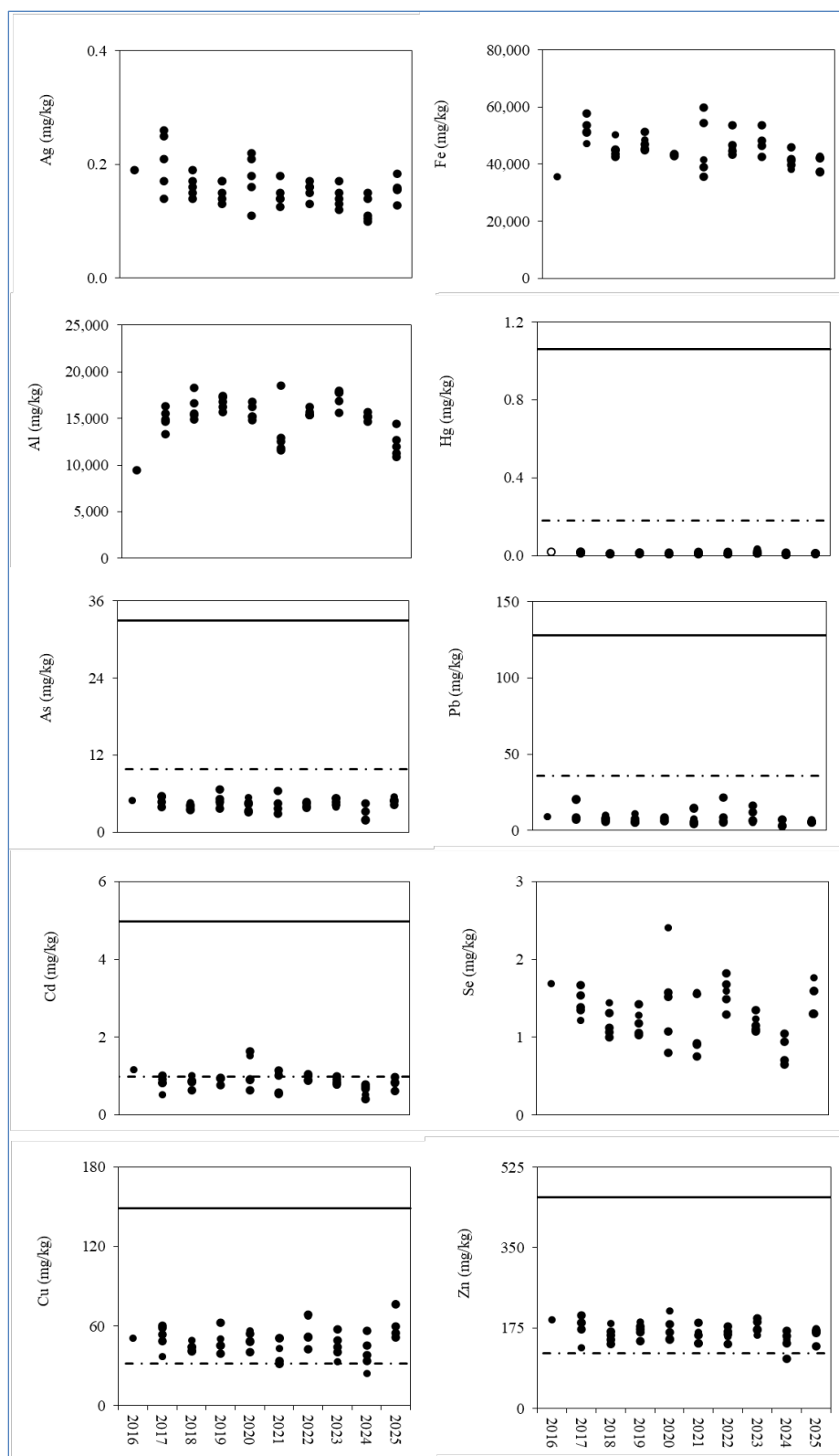


Figure 16.–Lower Glacier Creek sediment element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit. The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

Middle Glacier Creek Site

We sampled Middle Glacier Creek on June 10, 2025, and collected periphyton, BMI, fish, and sediment samples and measured basic water quality at 1630 hours (Table 10).

Table 10.—Middle Glacier Creek water quality data.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/10/2025	3.67	12.14	173	107	ND

Periphyton: Chlorophyll Density and Composition

The 2025 Middle Glacier Creek mean Chl-*a* density was 0.99 mg/m² (Table 11; Figure 17), among the lowest of means observed since 2016. As in previous years, the samples contained about 87% Chl-*a* and 13% Chl-*c*; Chl-*b* was detected in one sample below the estimated reporting limit (0.23 mg/m²; Figure 18).

Table 11.—Middle Glacier Creek mean chlorophylls *a*, *b*, and *c* densities.

Sample Date	Chl- <i>a</i> (mg/m ²)	Chl- <i>b</i> (mg/m ²)	Chl- <i>c</i> (mg/m ²)
6/8/2016	1.50 ± 1.18	0.00	0.25
6/9/2017	0.81 ± 0.45	0.00	0.10
5/31/2018	1.76 ± 0.79	0.00	0.29
6/7/2019	0.33 ± 0.24	0.01	0.04
6/2/2020	1.19 ± 0.89	0.01	0.16
6/15/2021	2.03 ± 2.38	0.00	0.25
6/14/2022	0.97 ± 0.92	0.00	0.27
6/6/2023	4.26 ± 1.85	0.00	0.58
6/19/2024	3.70 ± 2.81	0.00	0.44
6/10/2025	0.99 ± 0.74	0.00	0.14

Note: Chl-*a* mean density ± 1 SD.

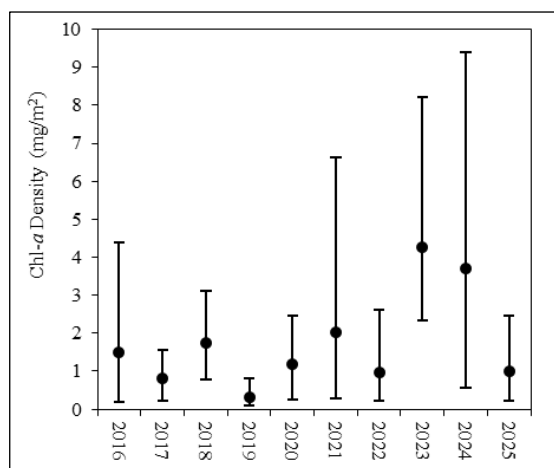


Figure 17.—Middle Glacier Creek Chl-*a* densities.

Note: Minimum, mean, and maximum values shown.

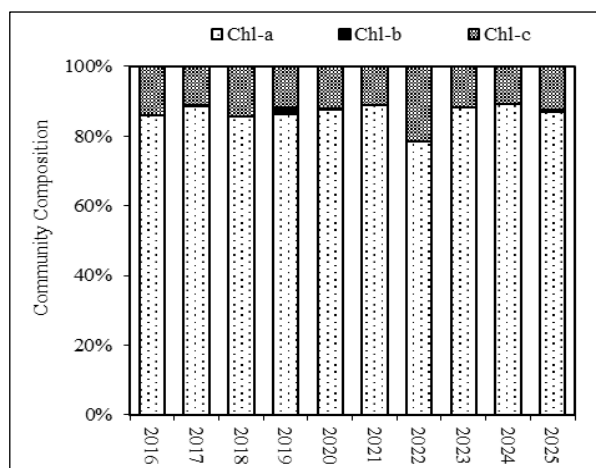


Figure 18.—Middle Glacier Creek mean proportions of chlorophylls *a*, *b*, and *c*.

Benthic Macroinvertebrate Density and Community Composition

Among the 2025 Middle Glacier Creek BMI samples, we identified 11 taxa and estimate mean density at 405 BMI/m², of which 6% were EPT insects; these were the lowest density, percent EPT, and number of taxa observed at the site (Table 12; Figures 19, 20). As in previous years, the dominant taxon was Diptera: Chironomidae, representing 85% of the samples.

Table 12.—Middle Glacier Creek BMI data summaries.

	6/8/2016	6/9/2017	5/31/2018	6/7/2019	6/2/2020	6/15/2021	6/14/2022	6/6/2023	6/3/2024	6/10/2025
Mean BMI density (per m ²)	2,299	593	504	215	754	842	1,192	1,220	1,400	405
Total BMI taxa	22	14	12	11	25	27	25	17	12	11
Number of EPT taxa	12	6	5	8	13	11	13	10	6	4
Proportion of EPT insects	13%	12%	9%	28%	24%	33%	12%	29%	8%	6%
Proportion of Chironomidae insects	85%	82%	87%	68%	69%	57%	79%	70%	88%	85%

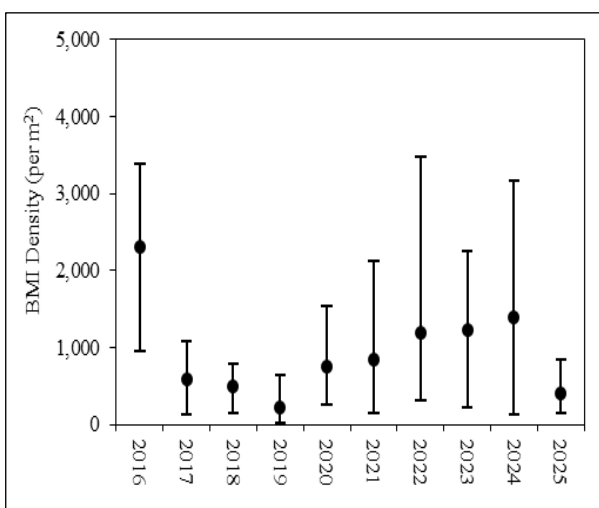


Figure 19.—Middle Glacier Creek BMI densities.

Note: Minimum, mean, and maximum values shown.

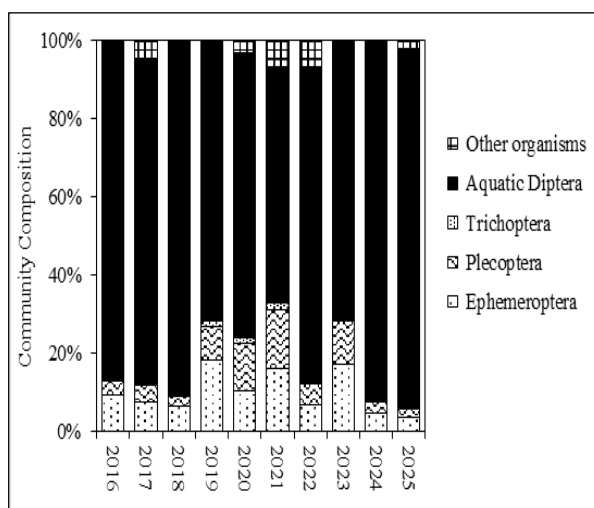


Figure 20.—Middle Glacier Creek mean BMI

community compositions.

Resident Fish Condition and Element Concentrations

We retained one Dolly Varden (91 mm) for whole body element analyses from Middle Glacier Creek in 2025, with a fish condition factor of 1.3. We were unable to capture additional fish within the sample size range, and we did not capture other fish species. The 2025 whole body Dolly Varden element concentration was within the range of concentrations observed in 2016–2024, except for As and Cd which were the greatest concentrations observed at the site (Figure 21).

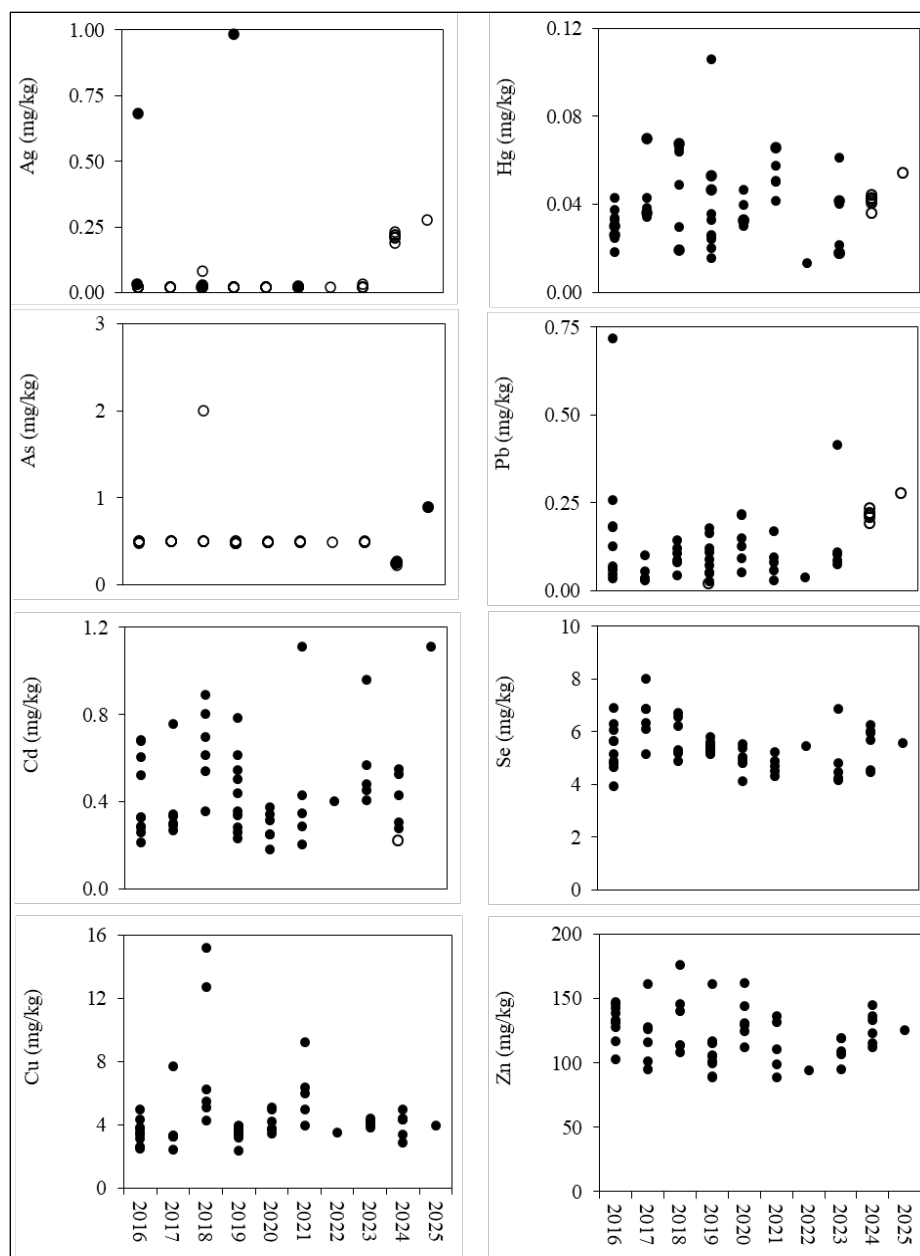


Figure 21.—Middle Glacier Creek whole body Dolly Varden element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit.

Sediment Composition and Element Concentrations

The 2025 Middle Glacier Creek sediment samples largely included particle sizes less than 9.5 mm with the majority under 1 mm. The predominant elements were Fe and Al, and the 2025 element concentrations generally were similar to the 2016–2024 results; however, Se concentrations were lower and Cu concentrations were slightly higher than previous years (Figure 22).

We evaluated the 2025 sediment sample element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and—like the 2016–2024 results—we found Cu and Zn concentrations near or above the TEC values, and As, Cd, Hg, and Pb concentrations below the TEC values.

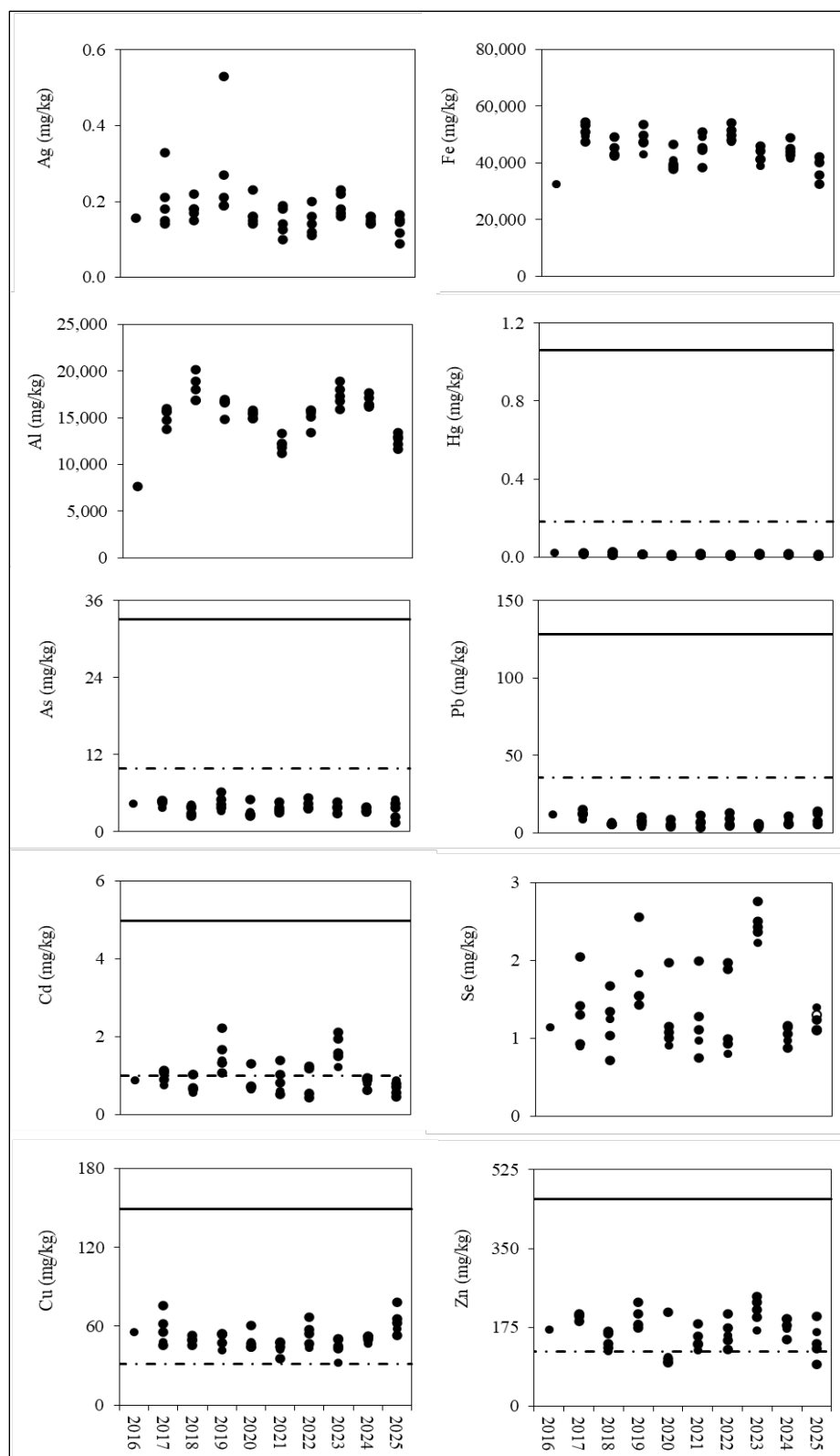


Figure 22.–Middle Glacier Creek sediment element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit. The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

SARAH CREEK

Lower Sarah Creek Site

We sampled Lower Sarah Creek on June 11, 2025, and collected periphyton, BMI, fish, and sediment samples and measured basic water quality at 1124 hours (Table 13). This was the second year sampling this site.

Table 13.—Lower Sarah Creek water quality data.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/11/2025	6.42	13.2	241	1.31	7.97

Periphyton: Chlorophyll Density and Composition

The 2025 Lower Sarah Creek mean Chl-*a* density was 3.37 mg/m², about the same as last year (Table 14; Figures 23, 24). The samples contained about 87% Chl-*a*, 13% Chl-*c*, and 0% Chl-*b* (Figure 20). Chl-*b* was not detected in any sample.

Table 14.—Lower Glacier Creek mean chlorophylls *a*, *b*, and *c* densities.

Sample Date	Chl- <i>a</i> (mg/m ²)	Chl- <i>b</i> (mg/m ²)	Chl- <i>c</i> (mg/m ²)
6/19/2024	3.68 ± 3.37	0.00	0.36
6/10/2025	3.37 ± 1.12	0.00	0.50

Note: Chl-*a* mean density ± 1 SD.

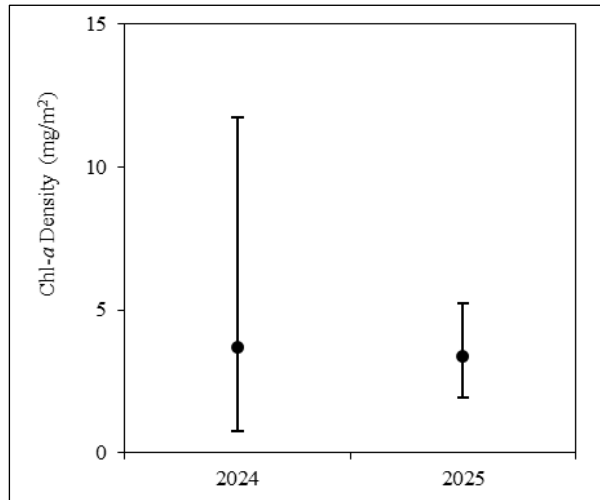


Figure 23.—Lower Sarah Creek Chl-*a* densities.
Note: Minimum, mean, and maximum values shown.

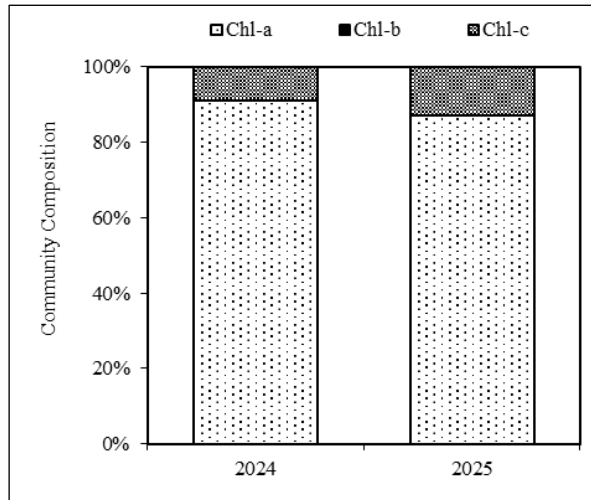


Figure 24.—Lower Sarah Creek mean proportions of chlorophylls *a*, *b*, and *c*.

Benthic Macroinvertebrate Density and Community Composition

Among the 2025 Lower Sarah Creek BMI samples, we identified 22 taxa and estimated mean density at 1,163 BMI/m², of which 71% were EPT insects—generally greater than last year (Table 15; Figures 25, 26). The dominant taxa were Ephemeroptera: *Baetis*, representing 51% and Diptera: Chironomidae, representing 23% of the samples.

Table 15.—Lower Sarah Creek BMI data summaries.

	6/4/2024	6/11/2025
Mean BMI density (per m ²)	579	1163
Total BMI taxa	26	22
Number of EPT taxa	13	14
Proportion of EPT insects	50%	71%
Proportion of Chironomidae insects	25%	23%

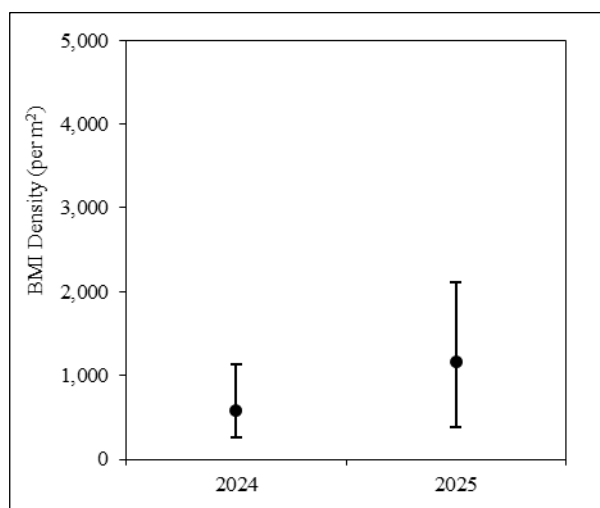


Figure 25.—Lower Sarah Creek BMI densities.
Note: Minimum, mean, and maximum values shown.

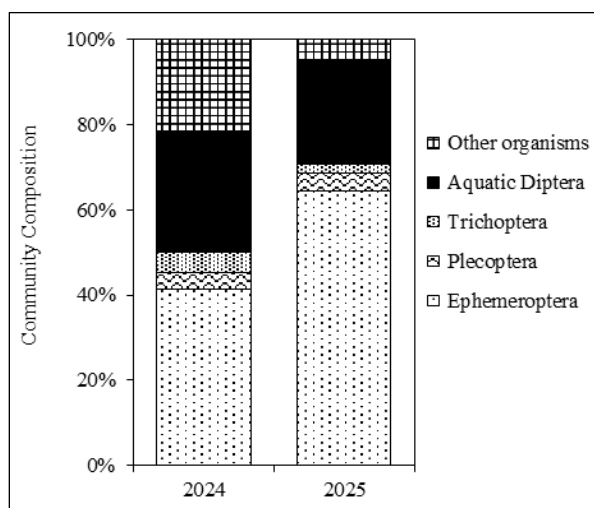


Figure 26.—Lower Sarah Creek mean BMI community compositions.

Resident Fish Condition and Element Concentrations

Due to fish scarcity within the desired size range, we retained three Dolly Varden and one cutthroat trout within the sample fish size range. Of the three whole body Dolly Varden (100–121 mm FL) samples and the one cutthroat trout (88 mm FL) sample we retained from Lower Sarah Creek in 2025, mean fish condition was 1.1 for Dolly Varden and 1.0 for cutthroat trout. We captured several young-of-year juvenile coho salmon throughout our sampling efforts that were too small for sampling. Element concentrations are presented in Figure 27 and are similar to previous years with some individuals containing greater concentrations of Hg and Se.

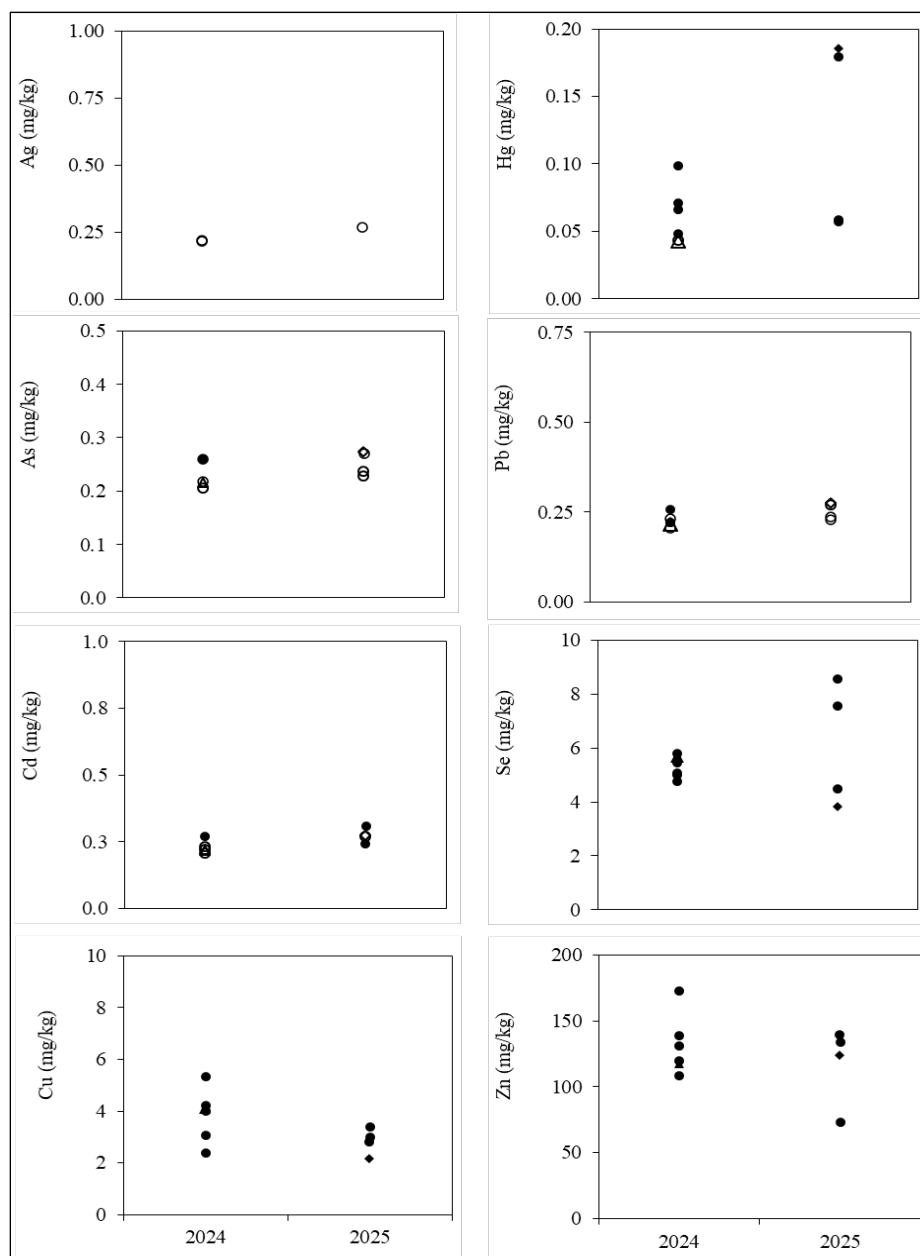


Figure 27.—Lower Sarah Creek whole body fish element concentrations.

Note: Element concentrations undetected (o, Δ, and ◇) are presented at the method reporting limit.

Note: Element concentrations of cutthroat trout are represented by diamond points and juvenile coho salmon are represented by triangle points.

Sediment Composition and Element Concentrations

The 2025 Lower Sarah Creek sediment samples included particle sizes less than 4.75 mm with the majority under 1 mm. The predominant elements were Fe and Al (Figure 28). We evaluated the 2025 sediment sample element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and we found Cu and Zn concentrations near or above the TEC values, and As, Cd, Hg, and Pb concentrations below the TEC values.

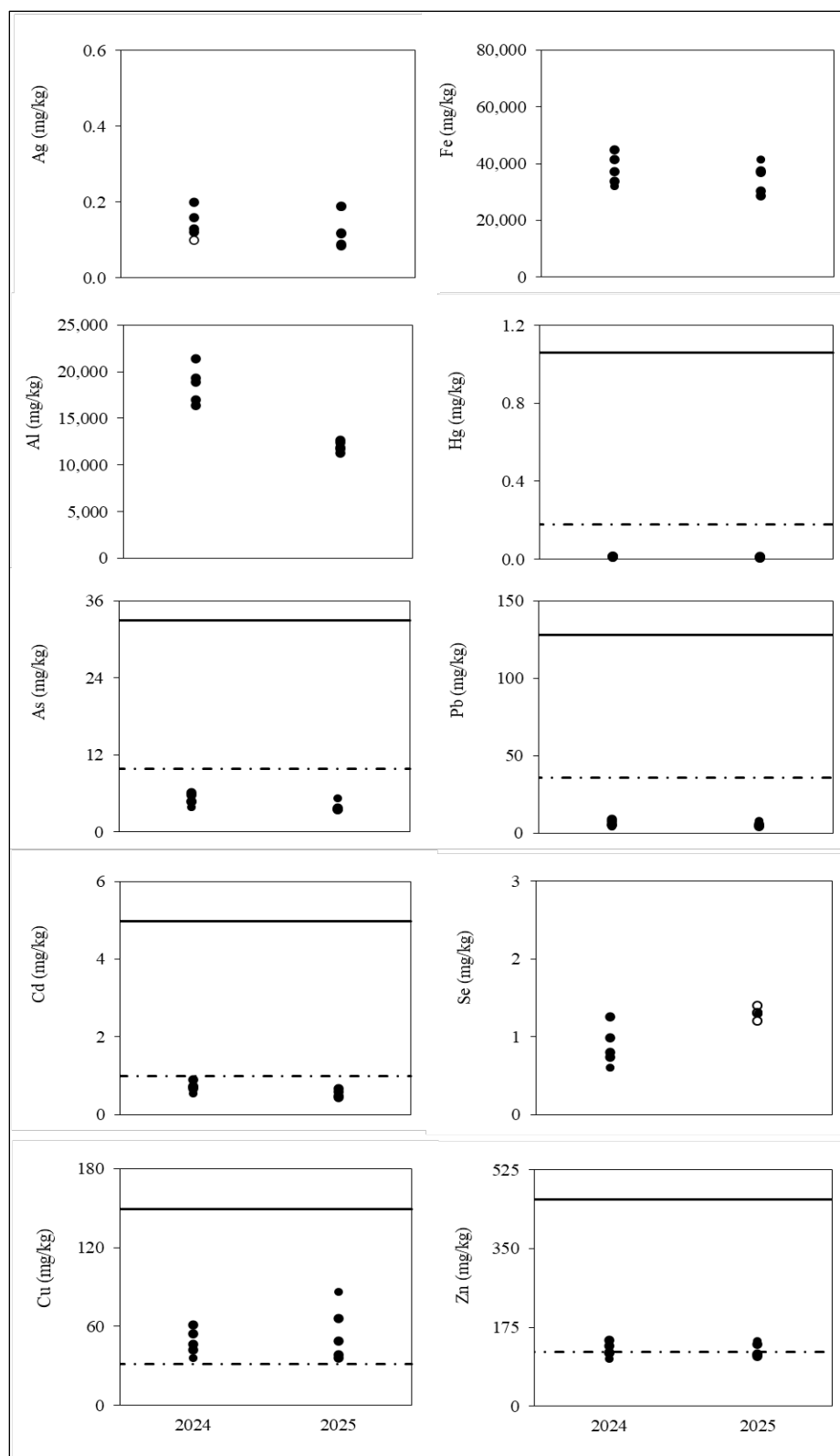


Figure 28.—Lower Sarah Creek sediment element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit. The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

Upper Sarah Creek Site

We sampled Upper Sarah Creek on June 11, 2025, and collected BMI, periphyton, and fish samples and measured basic water quality at 1000 hours (Table 16). This was the second year sampling this site.

Table 16.—Lower Sarah Creek water quality data.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/11/2025	4.69	13.1	241	1.56	8.03

Periphyton: Chlorophyll Density and Composition

The 2025 Upper Sarah Creek mean Chl-*a* density was 4.22 mg/m² (Table 17; Figure 29). The samples contained about 90% Chl-*a*, 10% Chl-*c*, and <1% Chl-*b* (Figure 30). Chl-*b* was detected in one sample.

Table 17.—Upper Sarah Creek mean chlorophylls *a*, *b*, and *c* densities.

Sample Date	Chl- <i>a</i> (mg/m ²)	Chl- <i>b</i> (mg/m ²)	Chl- <i>c</i> (mg/m ²)
6/19/2024	4.12 ± 2.45	0.01	0.45
6/10/2025	4.22 ± 1.44	0.05	0.40

Note: Chl-*a* mean density ± 1 SD.

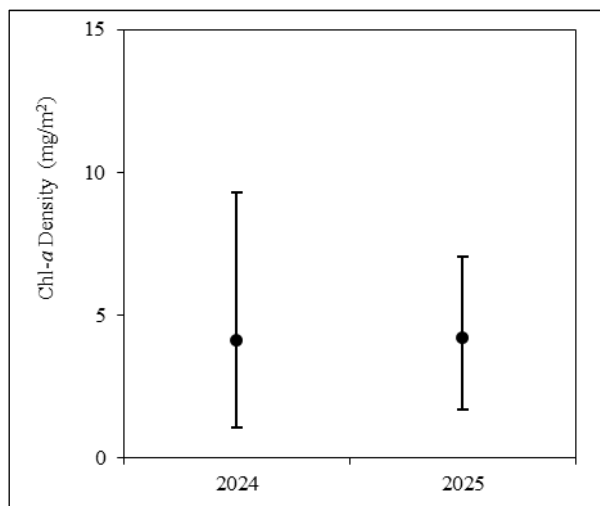


Figure 29.—Upper Sarah Creek Chl-*a* densities.
Note: Minimum, mean, and maximum values shown.

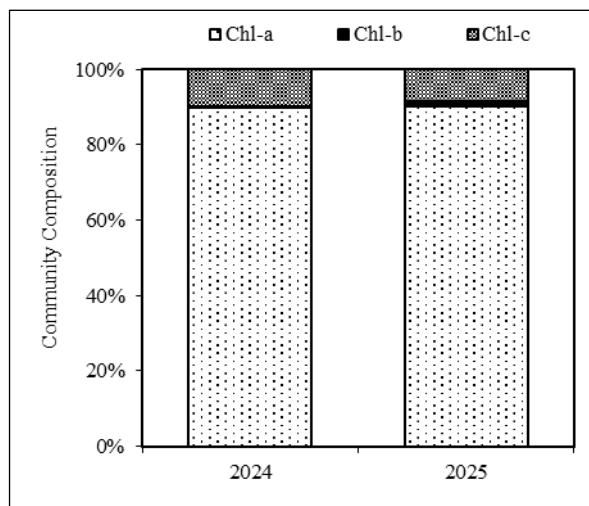


Figure 30.—Upper Sarah Creek mean proportions of chlorophylls *a*, *b*, and *c*.

Benthic Macroinvertebrate Density and Community Composition

Among the 2025 Upper Sarah Creek BMI samples, we identified 28 taxa and estimated mean density at 3,589 BMI/m²—greater than last year— of which 45% were EPT insects (Table 18; Figures 31, 32). The dominant taxa were Ephemeroptera: *Baetis*, representing 29% of the samples, Oligochaeta, not differentiated, representing 24% of the samples, and Diptera: Chironomidae, representing 22% of the samples.

Table 18.—Upper Sarah Creek BMI data summaries.

	6/4/2024	6/11/2025
Mean BMI density (per m ²)	1,565	3,589
Total BMI taxa	30	28
Number of EPT taxa	16	16
Proportion of EPT insects	75%	45%
Proportion of Chironomidae insects	13%	22%

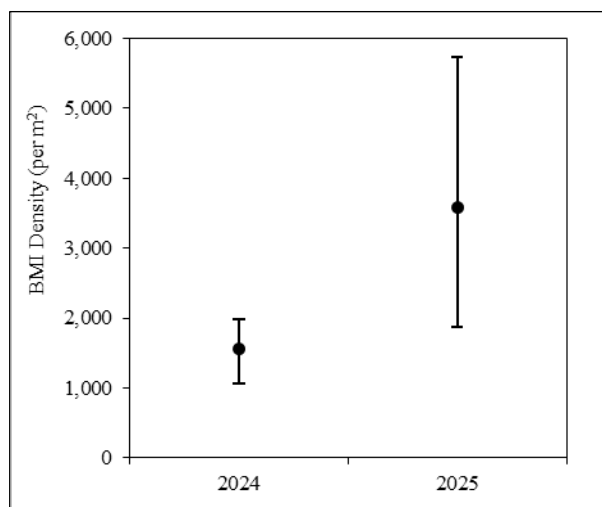


Figure 31.—Upper Sarah Creek BMI densities.
Note: Minimum, mean, and maximum values shown.

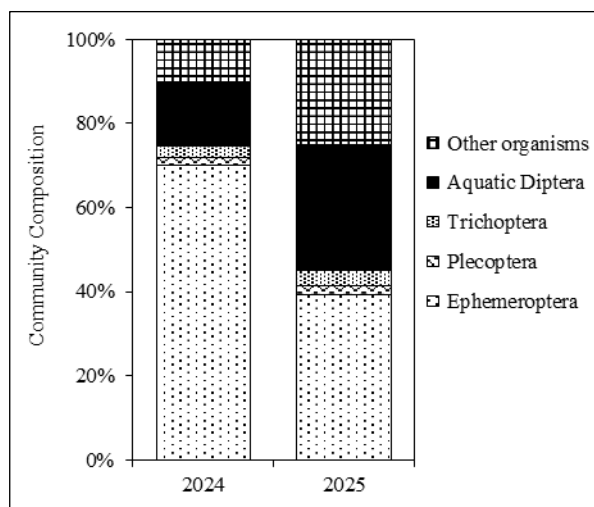


Figure 32.—Upper Sarah Creek mean BMI community compositions.

Resident Fish Condition and Element Concentrations

Of the ten whole body Dolly Varden (83–120 mm) samples we retained from Upper Sarah Creek in 2025, mean fish condition was 1.1. Like 2024, Cu, Se and Zn showed higher variability between samples than other elements (Figure 33). One Cd concentration exceeded all the other sample concentrations for both years.

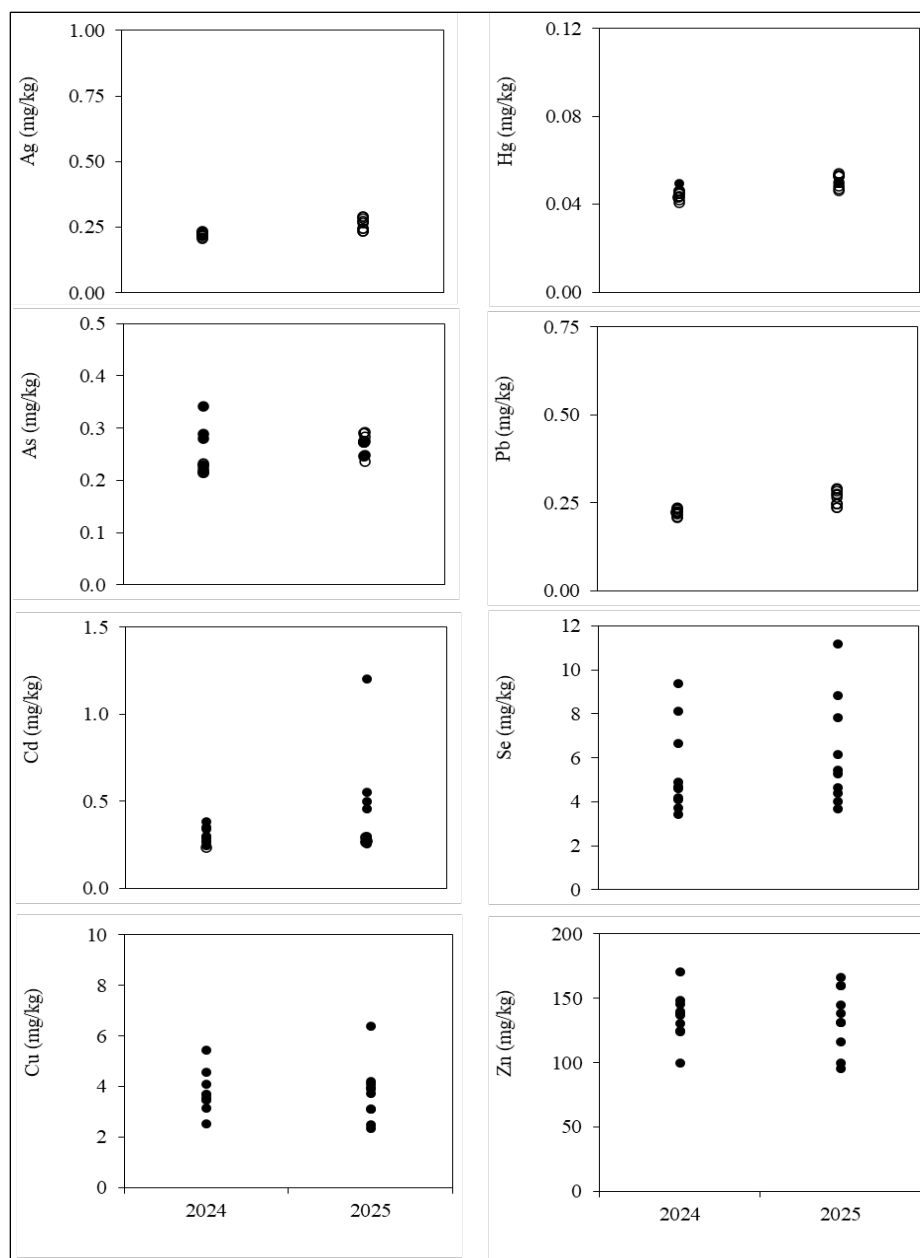


Figure 33.—Upper Sarah Creek whole body Dolly Varden element concentrations.
Note: Element concentrations undetected (o) are presented at the method reporting limit.

Sediment Composition and Element Concentrations

The 2025 Upper Sarah Creek sediment samples included particle sizes less than 9.5 mm with the majority under 1 mm. The predominant elements were Fe and Al, (Figure 34).

We evaluated the 2025 sediment sample element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and we found Cu and Zn concentrations near or above the TEC values, and As, Cd, Hg, and Pb concentrations below the TEC values, like 2024.

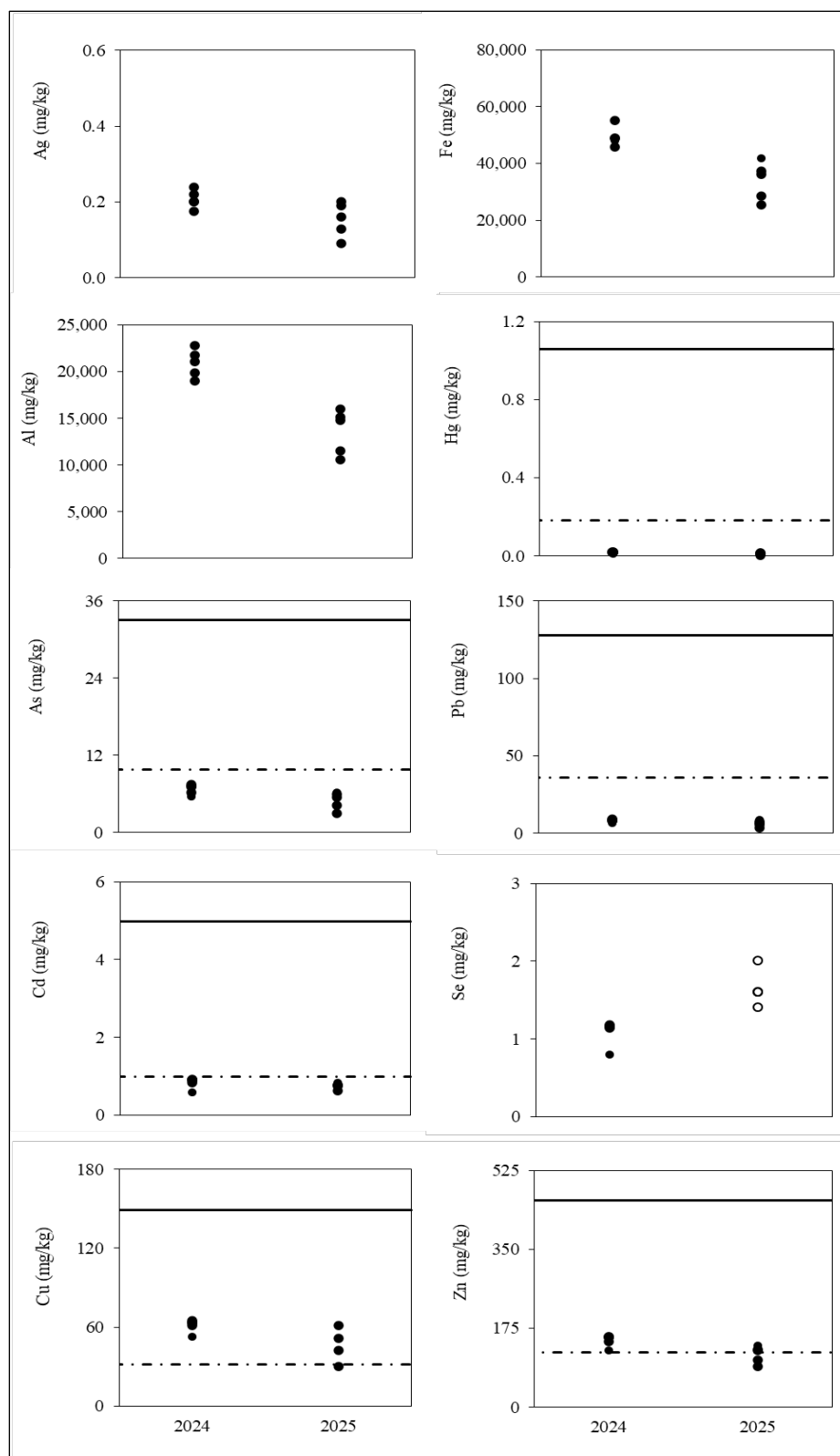


Figure 34.–Upper Sarah Creek sediment element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit. The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

PLATEAU CREEK

Plateau Creek Site

We sampled Plateau Creek on June 11, 2025, for a second year, and collected BMI, periphyton, fish samples, and measured basic water quality at 1000 hours (Table 19). This was the second year sampling this site.

Table 19.—Plateau Creek water quality data.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/11/2025	5.84	13.09	145	0.55	7.77

Periphyton: Chlorophyll Density and Composition

The 2025 Plateau Creek mean Chl-*a* density was 11.23 mg/m² (Table 20; Figure 35). The samples contained about 89% Chl-*a*, 11% Chl-*c*, and 0% Chl-*b* (Figure 36). Chl-*b* was not detected in any of the samples.

Table 20.—Plateau Creek mean chlorophylls *a*, *b*, and *c* densities.

Sample Date	Chl- <i>a</i> (mg/m ²)	Chl- <i>b</i> (mg/m ²)	Chl- <i>c</i> (mg/m ²)
6/19/2024	29.23 ±25.46	0.00	4.38
6/11/2025	11.23 ±12.76	0.00	1.37

Note: Chl-*a* mean density ± 1 SD.

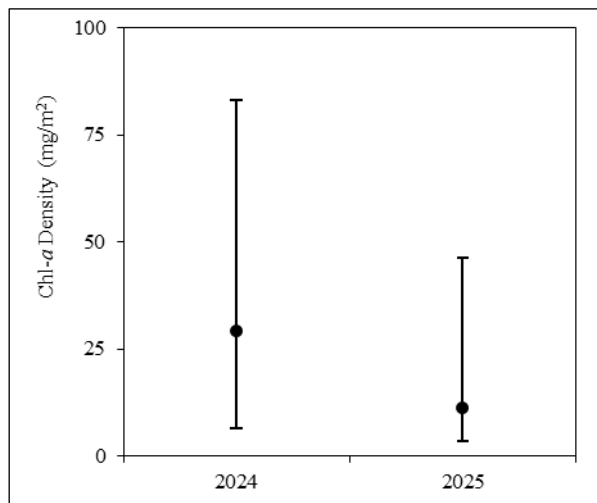


Figure 35.—Plateau Creek Chl-*a* densities.
Note: Minimum, mean, and maximum values shown.

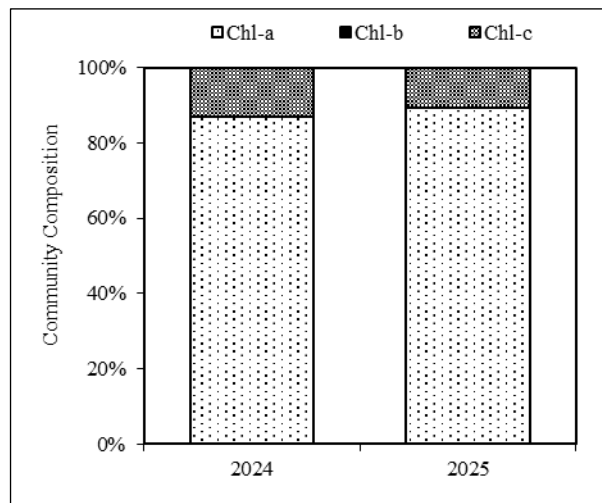


Figure 36.—Plateau Creek mean proportions of chlorophylls *a*, *b*, and *c*.

Benthic Macroinvertebrate Density and Community Composition

Among the 2025 Plateau Creek BMI samples, we identified 28 taxa and estimated mean density at 4,188 BMI/m²—both greater than last year—of which 60% were EPT insects (Table 21; Figures 37, 38). The dominant taxa were Diptera: Chironomidae, representing 36% and Ephemeroptera: *Baetis*, representing 29% of the samples.

Table 21.—Plateau Creek BMI data summaries.

	6/4/2024	6/11/2025
Mean BMI density (per m ²)	934	4,188
Total BMI taxa	25	28
Number of EPT taxa	14	18
Proportion of EPT insects	60%	60%
Proportion of Chironomidae insects	31%	36%

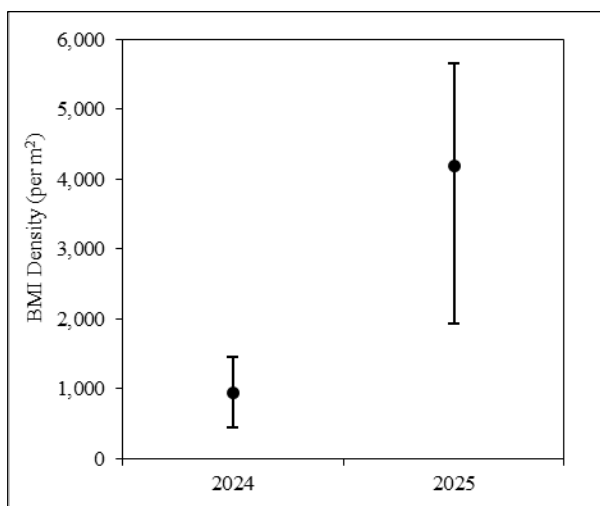


Figure 37.—Plateau Creek BMI densities.

Note: Minimum, mean, and maximum values shown.

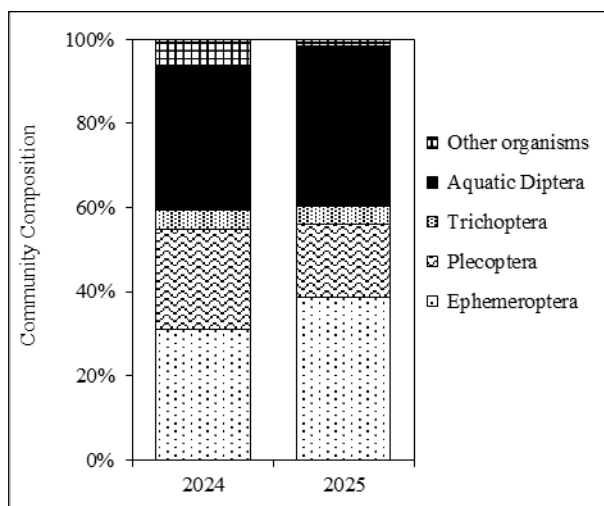


Figure 38.—Plateau Creek mean BMI community compositions.

Resident Fish Condition and Element Concentrations

Of the ten whole body fish retained at Plateau Creek, eight were Dolly Varden (79–104 mm FL) with a mean fish condition of 1.1, and two were cutthroat trout (82–83 mm FL) with a mean fish condition of 0.9. Cd, Hg, Se, and Zn showed greater variability between samples than other elements (Figure 39).

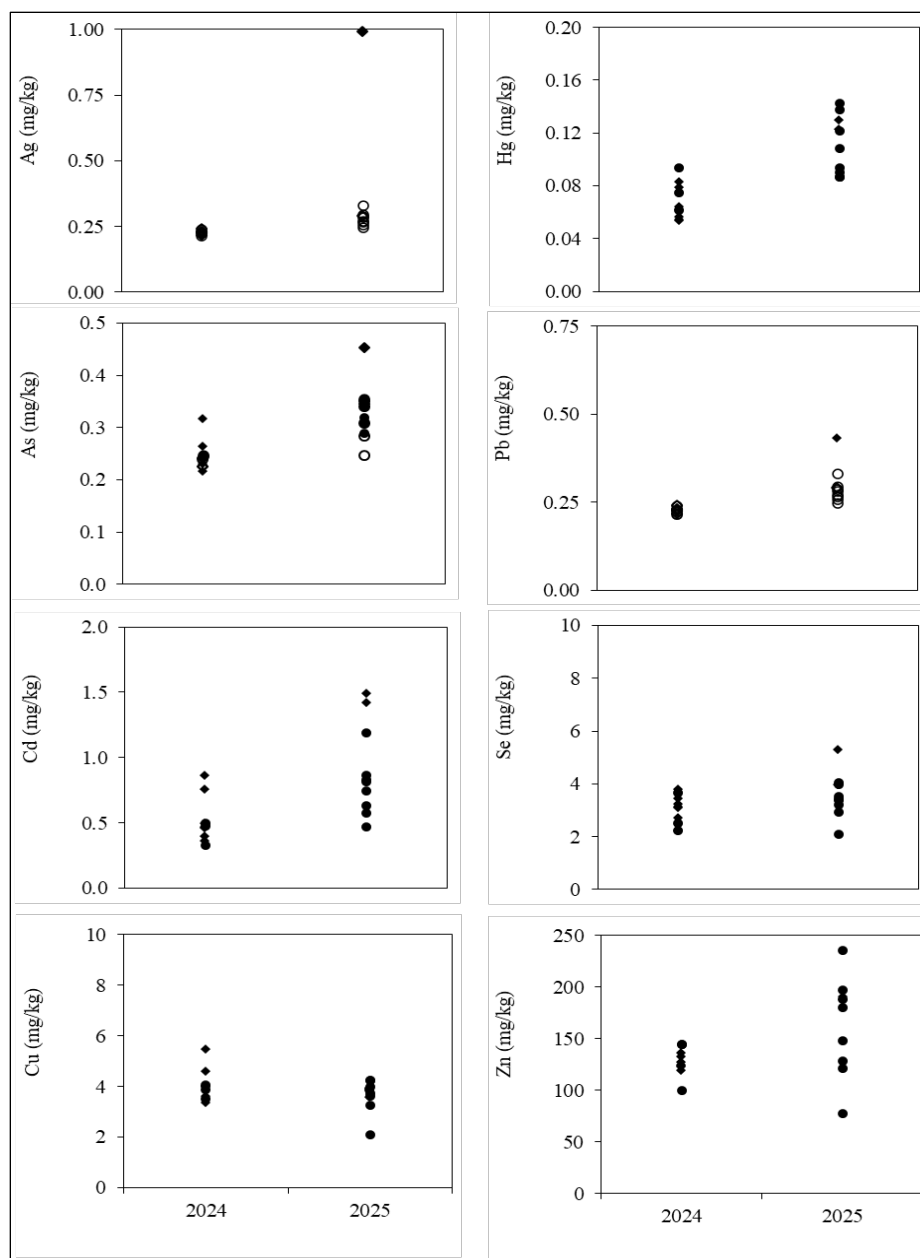


Figure 39.–Plateau Creek whole body fish element concentrations.

Note: Element concentrations undetected (o and ◇) are presented at the method reporting limit.

Note: Element concentrations of juvenile cutthroat trout are represented by diamond points.

Sediment Composition and Element Concentrations

The 2025 Plateau Creek sediment samples included particle sizes less than 9.5 mm with the majority under 1 mm. The predominant elements were Fe and Al (Figure 40).

We evaluated the 2025 sediment sample element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and we found Cu and Zn concentrations near or above the TEC values, and As, Cd, Hg, and Pb concentrations below the TEC values.

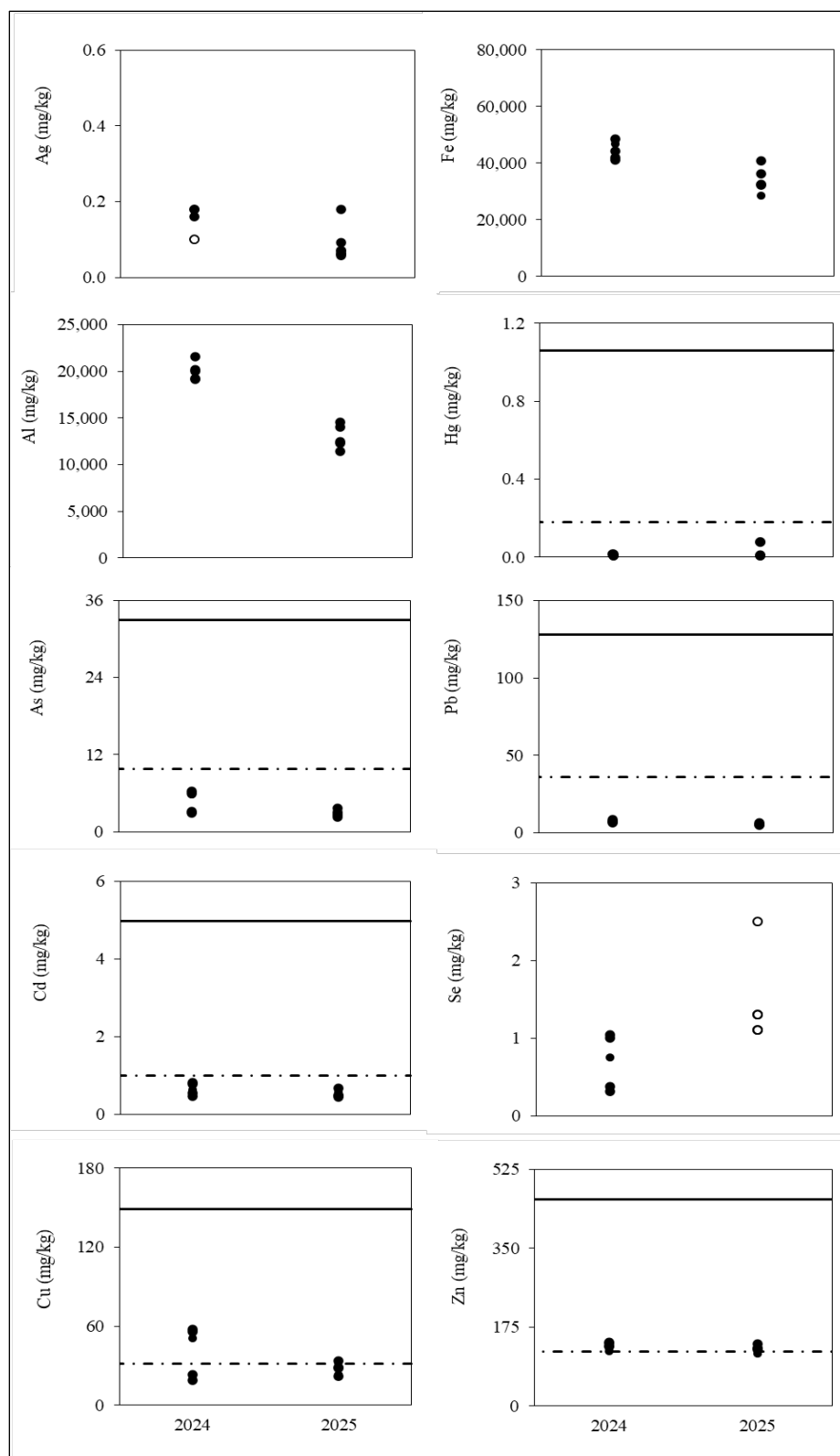


Figure 40.–Plateau Creek sediment element concentrations.

Note: Element concentrations undetected (o) are presented at the method reporting limit. The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

COMPARISONS AMONG SITES

Periphyton: Chlorophyll Density and Composition

Plateau Creek had the highest mean Chl-*a* density among sites, and the highest mean density compared to all sites in 2025 (Figure 41). Lower Glacier Creek, and Lower and Upper Sarah Creek have similar mean periphyton densities, all higher than Middle Glacier Creek.

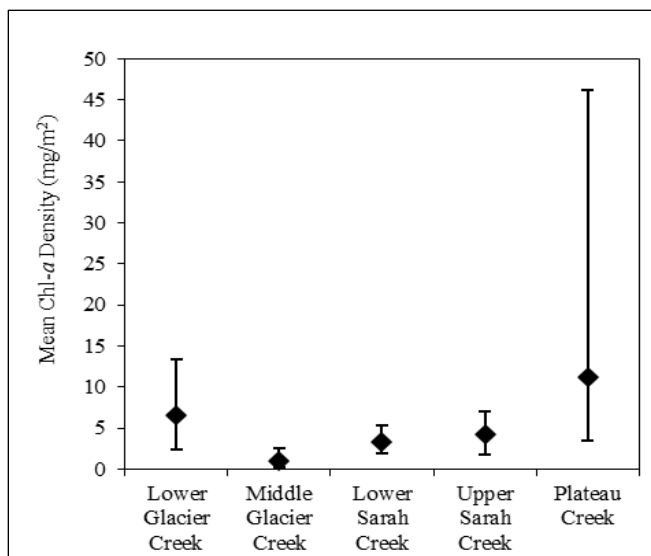


Figure 41.—Mean Palmer Project Chl-*a* densities, 2025.

Note: Minimum, mean, and maximum values shown.

Benthic Macroinvertebrate Density and Community Composition

In 2025, BMI density was similar between Lower and Middle Glacier Creek, however the composition of Lower Glacier Creek samples was more diverse than Middle Glacier Creek. Mean BMI density at Upper Sarah Creek was more than twice the BMI density at Lower Sarah Creek, and community composition was somewhat similar with Upper Sarah Creek containing more taxa and a larger proportion of Oligochaeta individuals. Plateau Creek mean BMI density was the greatest among sites, and community composition was similar to the Upper Sarah Creek site (Table 22; Figure 42).

Table 22.—Palmer Project 2025 BMI data summaries.

	Lower Glacier Creek	Middle Glacier Creek	Lower Sarah Creek	Upper Sarah Creek	Plateau Creek
Mean BMI density (per m ²)	516	405	1,163	3,589	4,188
Total BMI taxa	17	11	22	28	28
Number of EPT taxa	11	4	14	16	18
% EPT	36%	6%	71%	45%	60%

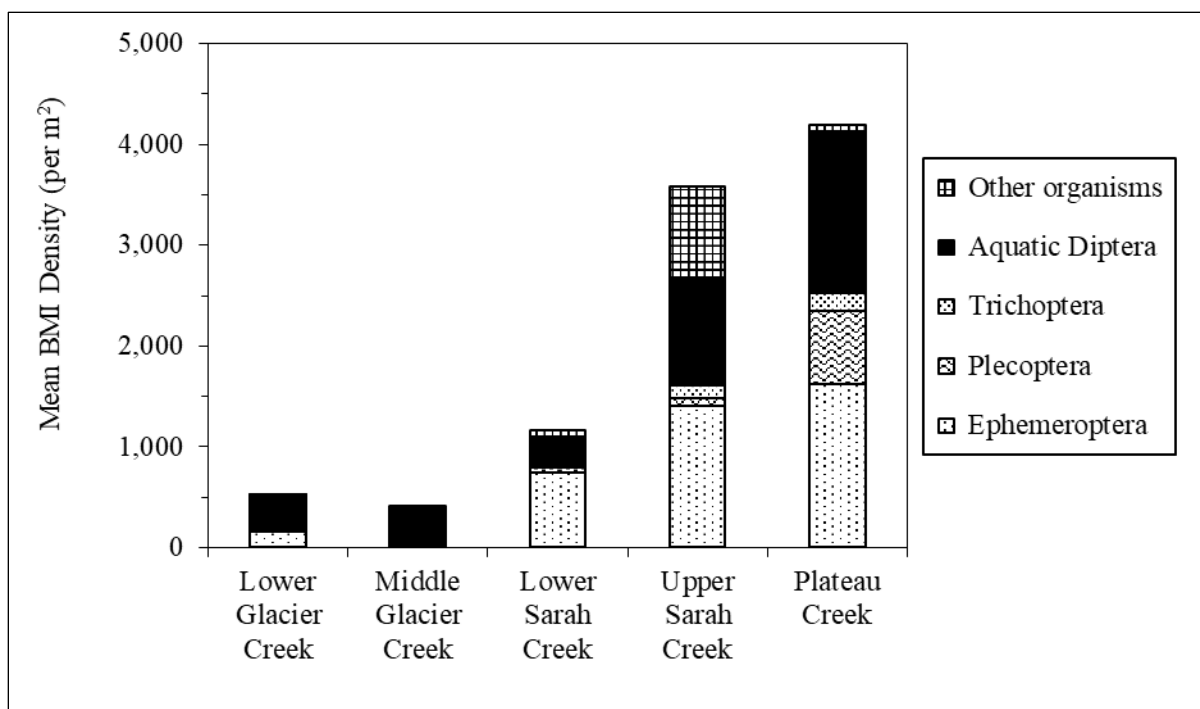


Figure 42.–Palmer Project Plateau Creek mean BMI community compositions, 2025.

Resident Fish Condition and Element Concentrations

Mean fish condition among the 2025 samples was similar across all sites, with Middle Glacier Creek the greatest, although the sample size was one. The results suggest healthy fish throughout the project area as values were similar to 2016–2024 results for Glacier Creek and other fish condition data collected in Southeast Alaska (Table 23; Albrecht 2026).

Table 23.–2025 Palmer Project mean fish sample condition.

Site	Condition
Lower Glacier Creek	1.07
Middle Glacier Creek	1.25
Lower Sarah Creek	1.07
Upper Sarah Creek	1.13
Plateau Creek	1.04

When we combined the fish element concentrations data for the Palmer Project by sample site, mean element concentrations were generally similar among sites (Figure 44). Comparisons involving Middle Glacier Creek are limited due to low sample size. Mean Ag and As concentrations were low and similar at all sites, as those elements are often not detected. Plateau Creek samples contained the highest mean Hg (slightly greater than Lower Sarah Creek) and lowest mean Se concentrations; and Lower Sarah Creek samples contained the lowest mean Cd and Cu concentrations. Across all sites, except Middle Glacier Creek, Zn concentrations were the most variable, which is similar to previous years. All element concentrations were within the ranges observed in whole body Dolly Varden samples collected from reference and exploration sites elsewhere in Alaska (Legere and Timothy 2016).

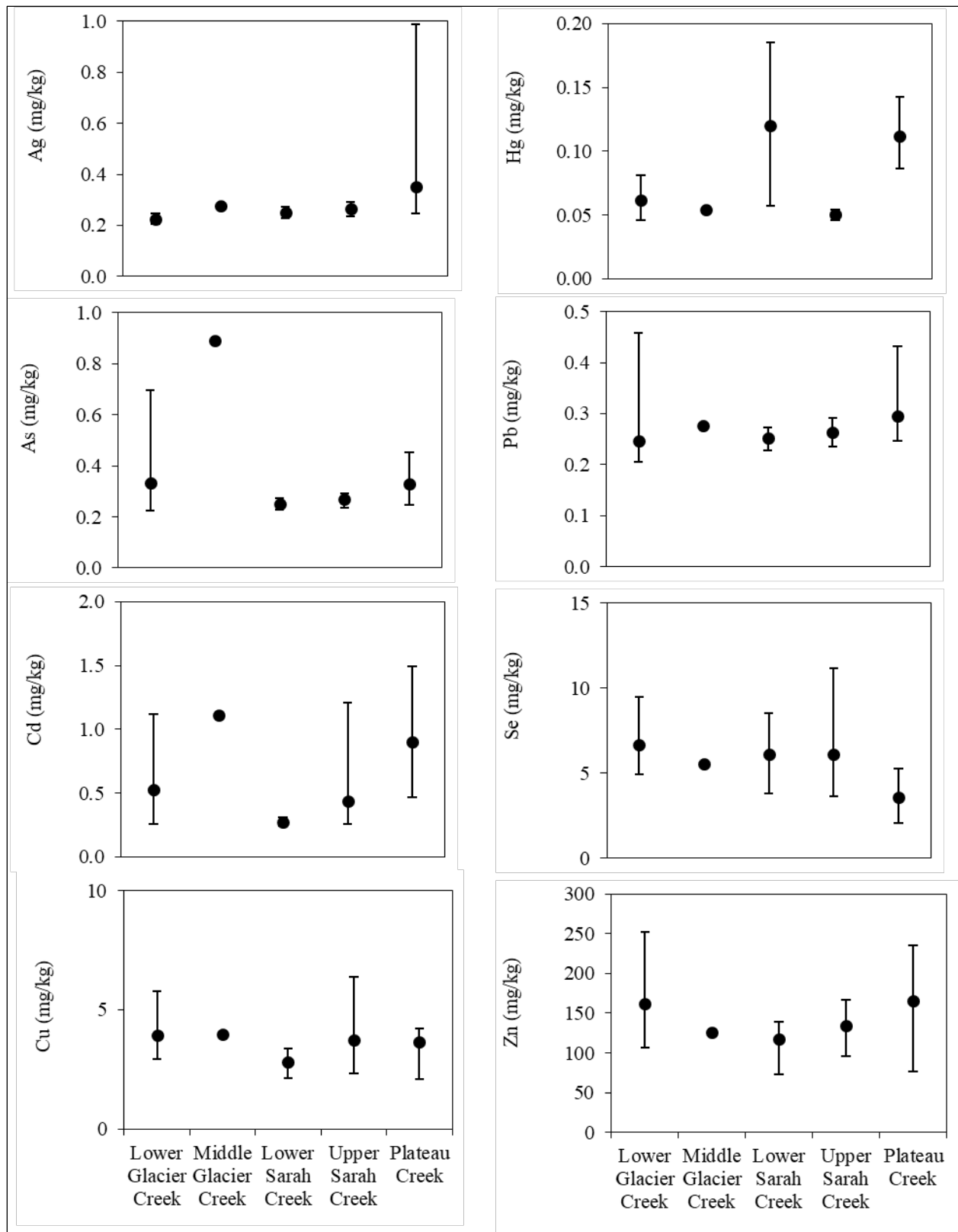


Figure 43.–Palmer Project whole body fish element concentrations, 2025.

Note: Mean (●), minimum, and maximum concentrations presented; element concentrations not detected are included at the method reporting limit.

Sediment Composition and Element Concentrations

The 2025 Palmer Project sediment samples were largely composed of sand and silt and mean element concentrations were generally similar at Glacier Creek sites 2016–2024 (Figure 45). In general, concentrations of all analytes were similar across sites, except for mean Cu concentration which was lowest at Plateau Creek, by nearly half of the next closest mean value (Upper Sarah Creek).

We evaluated the element concentration data against the guidelines for freshwater sediments published in Buchman (2008) and found mean sediment concentrations of Cu and Zn at or above the TEC values at all sites; and As, Cd, Hg, and Pb concentrations below the TEC values at all sites (Figure 45). Guidelines are not published for Ag, Al, Fe, or Se.

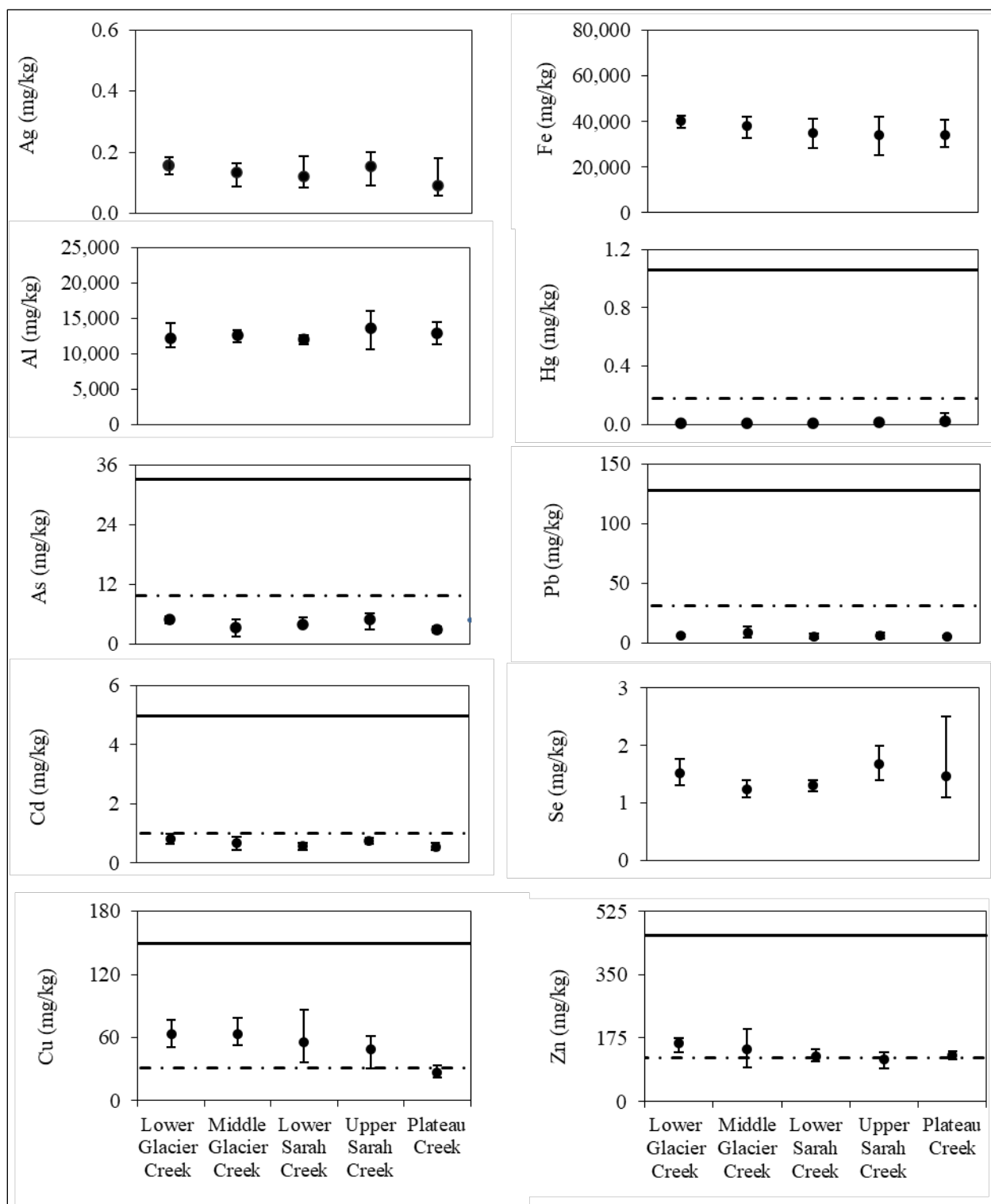


Figure 44.—Palmer Project sediment element concentrations, 2025.

Note: Mean (●), minimum, and maximum concentrations presented; element concentrations not detected are included at the at the method reporting limit.

Note: The dashed line represents the TEC and the solid line represents the PEC for freshwater sediments (Buchman 2008); guidelines are not published for Ag, Al, Fe, or Se.

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APPENDIX A: WATER QUALITY DATA

Appendix A.1.–Lower Glacier Creek water quality data, 2016–2025.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Turbidity (NTU)	pH
6/7/2016	3.3	12.6	115	126	6.00 ^a
6/8/2017	6.5	13.6	129	306	8.32
5/30/2018	5.8	10.8	161	17	8.15 ^b
6/6/2019	6.6	12.4	134	11	6.76 ^c
6/3/2020	5.7	12.0	233	17	7.85
6/16/2021	5.1	ND	207	ND	8.20
6/13/2022	4.1	10.9	215	52	8.10
6/7/2023	4.9	14.9	229	25	8.09
6/3/2024	6.1	10.6	239	30	ND
6/12/2025	4.7	13.7	247	160	7.87

^a We used a colorpHast pH indicator strip with 0.5 unit sensitivity.

^b Taken by Allegra Cairns on 6/2/2018.

^c Taken by Allegra Cairns on 6/8/2019.

Appendix A.2.–Middle Glacier Creek water quality data, 2016–2025.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Turbidity (NTU)	pH
6/8/2016	3.1	14.1	129	57	6.00 ^a
6/9/2017	3.1	16.7	113	> 1000	8.38
5/31/2018	4.1	11.3	182	16	ND
6/7/2019	4.0	18.0	126	94	ND
6/2/2020	3.4	13.3	246	23	8.14
6/15/2021	2.6	ND	197	ND	7.98
6/14/2022	3.7	13.1	251	60	8.11
6/6/2023	4.0	14.2	258	43	8.09
6/3/2024	3.9	12.8	ND	32	ND
6/10/2025	3.7	12.1	173	107	ND

^a We used a colorpHast pH indicator strip with 0.5 unit sensitivity.

Appendix A.3.–Lower Sarah Creek water quality data, 2024–2025.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Turbidity (NTU)	pH
6/4/2024	5.2	12.0	216	10.1	ND
6/11/2025	6.4	13.2	241	1.3	7.97

Appendix A.4.–Upper Sarah Creek water quality data, 2024–2025.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/4/2024	5.1	13.3	213	17.6	ND
6/11/2025	4.7	13.1	241	1.6	8.03

Appendix A.5.–Plateau Creek water quality data, 2024–2025.

Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (μS/cm)	Turbidity (NTU)	pH
6/4/2024	3.8	11.7	117	3.1	ND
6/11/2025	5.8	13.1	145	0.6	7.77

APPENDIX B: CHLOROPHYLL DATA

Appendix B.1.–Lower Glacier Creek chlorophylls *a*, *b*, and *c* densities, 2016–2025.

mg/m ²	6/7/2016			6/8/2017			5/30/2018		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	3.35	0.00	0.47	1.50	0.00	0.17	0.21	0.00	0.08
	3.31	0.00	0.51	1.28	0.00	0.25	1.23	0.00	0.20
	2.56	0.00	0.45	2.89	0.00	0.30	3.31	0.00	0.51
	1.28	0.00	0.29	1.82	0.00	0.20	0.53	0.00	0.08
	3.10	0.00	0.38	1.92	0.00	0.25	0.53	0.00	0.07
	1.97	0.00	0.29	3.31	0.00	0.46	0.96	0.00	0.22
	0.53	0.00	0.11	1.92	0.00	0.24	3.10	0.00	0.53
	2.03	0.00	0.30	0.19	ND	ND	1.28	0.00	0.24
	3.52	0.00	0.63	1.39	0.00	0.21	0.43	0.15	0.27
	1.01	0.00	0.09	1.09	0.00	0.22	0.96	0.00	0.15
Mean	2.27	0.00	0.35	1.73	0.00	0.26	1.25	0.02	0.24
Minimum	0.53	0.00	0.09	0.19	0.00	0.17	0.21	0.00	0.07
Maximum	3.52	0.00	0.63	3.31	0.00	0.46	3.31	0.15	0.53

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

mg/m ²	6/6/2019			6/3/2020			6/16/2021		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	0.43	0.00	0.03	5.23	0.00	0.58	0.29	ND	ND
	0.10	ND	ND	6.19	0.00	0.86	0.63	0.06	0.24
	0.53	0.00	0.00	3.66	0.00	0.52	0.36	0.05	0.15
	0.14	0.00	0.00	2.20	0.00	0.23	0.29	ND	ND
	0.22	0.05	0.00	1.06	0.00	0.09	2.89	0.00	0.50
	0.10	ND	ND	1.34	0.00	0.11	1.39	0.00	0.32
	0.11	0.01	0.05	1.06	0.00	0.09	0.29	ND	ND
	1.92	0.00	0.18	9.90	0.00	1.10	0.32	0.02	0.14
	0.64	0.00	0.01	1.65	0.00	0.20	0.92	0.00	0.11
	0.10	ND	ND	6.84	0.00	0.89	0.29	ND	ND
Mean	0.43	0.01	0.04	3.91	0.00	0.47	0.77	0.02	0.24
Minimum	0.10	0.00	0.00	1.06	0.00	0.09	0.29	0.00	0.11
Maximum	1.92	0.05	0.18	9.90	0.00	1.10	2.89	0.06	0.50

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

Appendix B.1.—Continued.

mg/m ²	6/13/2022			6/7/2023			6/19/2024		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	1.17	0.00	0.19	5.32	0.00	0.73	0.22	0.00	0.00
	0.55	0.00	0.12	4.40	0.00	0.52	0.22	0.00	0.00
	4.72	0.00	0.81	4.91	0.00	0.69	0.22	0.00	0.00
	1.64	0.00	0.34	3.76	0.00	0.51	0.96	0.00	0.17
	0.22	ND	ND	9.51	0.00	0.82	0.22	0.00	0.00
	0.22	ND	ND	6.84	0.00	1.01	1.82	0.00	0.30
	3.80	0.00	0.70	4.81	0.00	0.60	ND	ND	ND
	2.78	0.00	0.53	6.30	0.00	0.75	0.43	0.00	0.07
	2.98	0.00	0.45	5.78	0.00	0.80	0.22	0.00	0.00
	0.37	0.00	0.00	3.52	0.00	0.50	0.22	0.00	0.00
Mean	1.85	0.00	0.39	5.51	0.00	0.69	0.50	0.00	0.06
Minimum	0.22	0.00	0.00	3.52	0.00	0.50	0.22	0.00	0.00
Maximum	4.72	0.00	0.81	9.51	0.00	1.01	1.82	0.00	0.30

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

mg/m ²	6/12/2025		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	3.52	0.00	0.45
	7.48	0.00	1.09
	11.21	0.00	1.56
	8.65	0.00	1.00
	6.94	0.00	1.03
	3.39	0.00	0.43
	13.35	0.00	1.73
	2.37	0.00	0.37
	3.52	0.00	0.50
	4.91	0.00	0.81
Mean	6.54	0.00	0.90
Minimum	2.37	0.00	0.37
Maximum	13.35	0.00	1.73

Appendix B.2.—Middle Glacier Creek chlorophylls *a*, *b*, and *c* densities, 2016–2025.

mg/m ²	6/8/2016			6/9/2017			5/31/2018		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	1.82	0.00	0.30	0.96	0.00	0.15	1.50	0.00	0.20
	4.38	0.00	0.75	0.75	0.00	0.15	1.92	0.00	0.27
	0.96	0.00	0.10	1.38	0.00	0.08	2.24	0.00	0.41
	1.60	0.00	0.26	1.56	0.00	0.22	2.78	0.00	0.44
	0.19	ND	ND	0.43	0.00	0.00	3.10	0.00	0.51
	1.17	0.00	0.13	0.75	0.00	0.05	0.96	0.00	0.14
	0.96	0.00	0.15	0.50	0.00	0.03	0.78	0.00	0.16
	1.82	0.00	0.27	1.17	0.00	0.23	1.60	0.00	0.25
	0.28	0.00	0.00	0.21	0.02	0.10	1.82	0.00	0.35
	1.82	0.00	0.27	0.43	0.00	0.02	0.85	0.00	0.20
Mean	1.50	0.00	0.25	0.81	0.00	0.10	1.76	0.00	0.29
Minimum	0.19	0.00	0.00	0.21	0.00	0.00	0.78	0.00	0.14
Maximum	4.38	0.00	0.75	1.56	0.02	0.23	3.10	0.00	0.51

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

mg/m ²	6/7/2019			6/2/2020			6/15/2021		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	0.83	0.00	0.05	0.25	ND	ND	6.19	0.00	0.70
	0.18	0.00	0.04	2.43	0.00	0.33	0.64	0.00	0.10
	0.55	0.00	0.02	1.70	0.00	0.17	1.11	0.00	0.08
	0.10	ND	ND	0.28	0.00	0.03	0.85	0.00	0.01
	0.21	0.00	0.02	0.73	0.00	0.07	1.19	0.00	0.13
	0.14	0.01	0.05	0.55	0.00	0.02	2.34	0.00	0.28
	0.18	0.06	0.11	0.96	0.00	0.10	0.64	0.03	0.13
	0.21	0.00	0.00	0.50	0.06	0.20	0.43	0.00	0.00
	0.53	0.00	0.02	2.48	0.00	0.32	0.29	ND	ND
	0.32	0.00	0.09	2.06	0.00	0.25	6.62	0.00	0.84
Mean	0.33	0.01	0.04	1.19	0.01	0.16	2.03	0.00	0.25
Minimum	0.10	0.00	0.00	0.25	0.00	0.02	0.29	0.00	0.00
Maximum	0.83	0.06	0.11	2.48	0.06	0.33	6.62	0.03	0.84

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

Appendix B.2.—Continued.

mg/m ²	6/14/2022			6/6/2023			6/19/2024		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	0.22	ND	ND	5.45	0.00	0.74	0.55	0.00	0.12
	1.92	0.00	0.28	3.76	0.00	0.54	2.46	0.00	0.36
	0.64	0.00	0.11	8.22	0.00	1.13	1.92	0.00	0.25
	2.62	0.00	0.30	2.39	0.00	0.37	6.41	0.00	0.56
	0.22	ND	ND	5.83	0.00	0.79	2.14	0.00	0.28
	0.22	ND	ND	4.68	0.00	0.65	4.27	0.00	0.57
	0.22	ND	ND	2.75	0.00	0.35	9.40	0.00	1.10
	0.22	ND	ND	4.13	0.00	0.53	0.96	0.00	0.16
	1.69	0.00	0.33	2.35	0.00	0.31	6.09	0.00	0.72
	1.71	0.00	0.31	3.03	0.00	0.35	2.78	0.00	0.31
Mean	0.97	0.00	0.27	4.26	0.00	0.58	3.70	0.00	0.44
Minimum	0.22	0.00	0.00	0.22	0.00	0.00	2.00	3.00	4.00
Maximum	2.62	0.00	0.33	8.22	0.00	1.13	9.40	0.00	1.10

Note: Bold value is the spectrophotometer estimated detection limit, Chl-*a* not detected.

mg/m ²	6/10/2025		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	0.23	0.00	0.00
	1.42	0.00	0.24
	0.23	0.00	0.00
	1.10	0.00	0.15
	2.46	0.00	0.36
	0.36	0.05	0.15
	1.50	0.00	0.21
	0.96	0.00	0.09
	1.39	0.00	0.22
	0.23	0.00	0.00
Mean	0.99	0.00	0.14
Minimum	2.00	3.00	4.00
Maximum	2.46	0.05	0.36

Appendix B.3.—Lower Sarah Creek chlorophylls *a*, *b*, and *c* densities, 2024–2025.

mg/m ²	6/19/2024			6/11/2025		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	2.03	0.00	0.23	2.46	0.00	0.42
	1.07	0.00	0.14	4.70	0.00	0.83
	3.20	0.00	0.42	2.56	0.00	0.46
	0.75	0.00	0.15	4.70	0.00	0.75
	5.98	0.00	0.39	1.92	0.00	0.30
	2.24	0.00	0.23	2.66	0.00	0.27
	2.46	0.00	0.24	5.24	0.00	0.70
	11.75	0.00	1.06	3.21	0.00	0.39
	1.50	0.00	0.21	3.20	0.00	0.50
	5.87	0.00	0.52	3.10	0.00	0.39
Mean	3.68	0.00	0.36	3.37	0.00	0.50
Minimum	0.75	0.00	0.14	1.92	0.00	0.27
Maximum	11.75	0.00	1.06	5.24	0.00	0.83

Appendix B.4.—Upper Sarah Creek chlorophylls *a*, *b*, and *c* densities, 2024–2025.

mg/m ²	6/19/2024			6/11/2025		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	9.29	0.12	0.74	4.27	0.00	0.52
	4.81	0.00	0.62	3.10	0.00	0.28
	6.19	0.00	0.64	4.49	0.00	0.37
	2.46	0.00	0.26	5.13	0.00	0.34
	4.38	0.00	0.55	3.10	0.00	0.34
	1.17	0.00	0.10	4.82	0.00	0.50
	3.42	0.00	0.42	7.05	0.53	0.37
	3.42	0.00	0.36	4.81	0.00	0.50
	1.07	0.00	0.10	1.71	0.00	0.21
	5.02	0.00	0.69	3.74	0.00	0.58
Mean	4.12	0.01	0.45	4.22	0.05	0.40
Minimum	1.07	0.00	0.10	1.71	0.00	0.21
Maximum	9.29	0.12	0.74	7.05	0.53	0.58

Appendix B.5.—Plateau Creek chlorophylls *a*, *b*, and *c* densities, 2024–2025.

mg/m ²	6/19/2024			6/11/2025		
	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>	Chl- <i>a</i>	Chl- <i>b</i>	Chl- <i>c</i>
	83.09	0.00	9.99	46.24	0.00	5.11
	15.91	0.00	2.59	6.84	0.00	0.86
	10.25	0.00	3.49	4.81	0.00	0.70
	62.58	0.00	8.66	11.75	0.00	1.33
	36.74	0.00	5.76	14.42	0.00	1.84
	10.68	0.00	1.67	5.45	0.00	0.80
	6.62	0.00	0.97	4.91	0.00	0.48
	32.36	0.00	4.69	8.44	0.00	0.82
	22.64	0.00	4.36	3.42	0.00	0.50
	11.43	0.00	1.65	6.09	0.00	1.23
Mean	29.23	0.00	4.38	11.23	0.00	1.37
Minimum	6.62	0.00	0.97	3.42	0.00	0.48
Maximum	83.09	0.00	9.99	46.24	0.00	5.11

APPENDIX C: BENTHIC MACROINVERTEBRATE DATA

Appendix C.1.–Lower Glacier Creek BMI sample data, 2025.

Class or Subclass	Order	Family	Genus	Sample Number						Total
				1	2	3	4	5	6	
Insecta	Ephemeroptera	Baetidae	<i>Baetis</i>	3	5	38	9	5	13	73
		Ephemerellidae	<i>Drunella</i>	0	0	1	0	0	0	1
		Heptageniidae	<i>Cinygmula</i>	0	1	1	0	0	1	3
			<i>Epeorus</i>	0	0	2	1	0	1	4
			<i>Rhithrogena</i>	0	1	2	0	0	1	4
	Plecoptera	Chloroperlidae	<i>Suwallia</i>	0	0	2	4	2	3	11
		Leuctridae	<i>Despaxia</i>	0	0	0	1	0	0	1
		Nemouridae	<i>Podmosta</i>	0	1	2	0	1	0	4
			<i>Shipsa</i>	0	0	1	0	0	0	1
			<i>Zapada</i>	1	0	1	0	0	0	2
	Trichoptera	Glossosomatidae	<i>Glossosoma</i>	1	0	0	0	0	0	1
	Diptera	Chironomidae	unidentified	7	26	48	62	9	24	176
		Psychodidae	<i>Maruina</i>	1	0	0	1	0	0	2
		Tipulidae	<i>Limonia</i>	0	0	0	1	0	0	1
			<i>Molophilus</i>	0	1	1	0	0	0	2
Arachnida (mites)	unidentified	unidentified	unidentified	1	0	0	0	0	0	1
Oligochaeta	unidentified	unidentified	unidentified	0	0	0	1	0	0	1
Misc Terrestrial	unidentified	unidentified	unidentified	0	1	3	2	0	0	6
Total Aquatic Organisms				14	35	99	80	17	43	288

Appendix C.2.–Lower Glacier Creek BMI data summaries, 2016–2025.

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total BMI taxa	17	30	16	12	25	26	30	12	27	17
Number of EPT taxa	9	13	10	5	12	12	14	9	11	11
Total counts										
Ephemeroptera	44	158	61	65	49	21	77	214	122	85
Plecoptera	13	41	22	12	26	35	52	66	75	19
Trichoptera	1	3	1	1	4	3	3	1	2	1
Aquatic Diptera	478	955	33	178	322	140	467	1,643	464	181
Other organisms	19	35	4	8	20	22	35	8	11	2
% Ephemeroptera	8%	13%	50%	25%	11.6%	9.5%	12.1%	11.1%	18.1%	29.5%
% Plecoptera	2%	3%	18%	5%	6.2%	15.8%	8.2%	3.4%	11.1%	6.6%
% Trichoptera	0.2%	0.3%	0.8%	0.4%	1.0%	1.4%	0.5%	0.1%	0.3%	0.3%
% Aquatic Diptera	86%	80%	27%	67%	76.5%	63.3%	73.7%	85.0%	68.8%	62.8%
% Other organisms	3%	3%	3%	3%	4.8%	10.0%	5.5%	0.4%	1.6%	0.7%
% EPT	10%	17%	69%	30%	19%	27%	21%	15%	30%	36%
% Chironomidae	85%	78%	26%	67%	74%	58%	71%	85%	67%	61%
Total aquatic invertebrates	555	1,192	121	264	421	221	634	1,932	674	288
Total terrestrial invertebrates	17	18	13	17	4	29	23	19	43	6
Total invertebrates	572	1,210	134	281	425	250	657	1,951	717	294
% Sample aquatic	97.0%	98.5%	90.3%	94.0%	99.1%	88.4%	96.5%	99.0%	94.0%	98.0%
% Sample terrestrial	3.0%	1.5%	0.0%	6.0%	0.9%	11.6%	3.5%	1.0%	6.0%	2.0%
Total sample area (m ²)	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558
Mean BMI density (per m ²)	995	2,136	217	473	754	396	1,136	3,462	1,208	516
±1 SD	373	1,015	151	148	463	150	439	2322	843	373

Appendix C.3.–Middle Glacier Creek BMI sample data, 2025.

				Sample Number						Total
Class or Subclass	Order	Family	Genus	1	2	3	4	5	6	
Insecta	Ephemeroptera	Baetidae	<i>Baetis</i>	0	1	0	6	1	0	8
	Plecoptera	Chloroperlidae	<i>Suwallia</i>	0	0	1	0	0	0	1
		Nemouridae	<i>Podmosta</i>	0	0	0	0	0	1	1
			<i>Shipsa</i>	0	0	0	0	2	1	3
	Trichoptera	Rhyacophilidae	<i>Ceratopogon</i>	0	0	1	0	0	0	1
	Diptera	Chironomidae	unidentified	12	29	26	27	66	33	193
		Empididae	<i>Chelifera</i>	0	0	1	0	0	0	1
		Psychodidae	<i>Maruina</i>	0	0	0	0	2	1	3
			<i>Pericoma</i>	0	0	0	1	0	2	3
		Tipulidae	<i>Molophilus</i>	1	0	2	1	1	1	6
		unidentified	unidentified	0	0	1	0	0	0	1
Oligochaeta	unidentified	unidentified	unidentified	0	0	1	1	2	1	5
Misc. Terrestrial	unidentified	unidentified	unidentified	2	2	1	5	5	2	17
Total Aquatic Organisms				13	30	33	36	74	40	226

Appendix C.4.–Middle Glacier Creek BMI data summaries, 2016–2025.

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total BMI taxa	22	14	12	11	25	27	25	17	12	11
Number of EPT taxa	12	6	5	8	13	11	13	10	6	4
Total counts										
Ephemeroptera	119	25	18	22	43	76	45	116	37	8
Plecoptera	45	14	7	10	52	70	35	77	22	5
Trichoptera	4	1	0	2	6	8	3	2	2	0
Aquatic Diptera	1,107	276	254	85	306	282	534	484	717	208
Other organisms	8	15	2	1	14	34	48	2	3	5
% Ephemeroptera	9.3%	7.6%	6.4%	18.3%	10.2%	16.2%	6.8%	17.0%	4.7%	3.5%
% Plecoptera	3.5%	4.2%	2.5%	8.3%	12.4%	14.9%	5.3%	11.3%	2.8%	2.2%
% Trichoptera	0.3%	0.3%	0.0%	1.7%	1.4%	1.7%	0.5%	0.3%	0.3%	0.0%
% Aquatic Diptera	86.3%	83.4%	90.4%	70.8%	72.7%	60.0%	80.3%	71.1%	91.8%	92.0%
% Other organisms	1.0%	4.5%	0.7%	0.8%	3.3%	7.2%	7.2%	0.3%	0.4%	2.2%
% EPT	13.0%	12.1%	8.9%	28.3%	24.0%	32.8%	12.5%	28.6%	7.8%	5.8%
% Chironomidae	85.0%	82.5%	87.2%	68.3%	68.6%	56.6%	78.8%	69.6%	87.7%	85.4%
Total aquatic invertebrates	1,283	331	281	120	421	470	665	681	781	226
Total terrestrial invertebrates	19	7	1	4	7	13	59	12	2	12
Total invertebrates	1,302	338	282	124	428	483	724	693	783	238
% Sample aquatic	98.5%	97.9%	99.6%	96.8%	98.4%	97.3%	91.9%	98.3%	99.7%	95.0%
% Sample terrestrial	1.5%	2.1%	0.4%	3.2%	1.6%	2.7%	8.1%	1.7%	0.3%	5.0%
Total sample area (m ²)	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558	0.558
Mean BMI density (per m ²)	2,299	593	504	215	754	842	1,192	1,220	1,400	405
±1 SD	976	392	249	249	484	743	1,261	743	1,219	239

Appendix C.5.–Lower Sarah Creek BMI sample data, 2025.

Class or Subclass	Order	Family	Genus	Sample Number						Total
				1	2	3	4	5	6	
Insecta	Ephemeroptera	Amelitidae	<i>Ameletus</i>	0	0	0	0	1	0	1
		Baetidae	<i>Baetis</i>	60	64	28	26	41	115	334
		Ephemerellidae	<i>Drunella</i>	8	17	0	1	2	7	35
		Heptageniidae	<i>Cinygmula</i>	6	0	1	0	7	15	29
			<i>Epeorus</i>	2	3	0	0	1	5	11
			<i>Rhithrogena</i>	2	0	2	0	2	2	8
	Plecoptera	Chloroperlidae	<i>Suwallia</i>	1	0	0	0	4	4	9
		Leuctridae	<i>Despaxia</i>	0	0	0	0	1	1	2
		Nemouridae	<i>Podmosta</i>	0	2	1	0	0	0	3
			<i>Zapada</i>	4	1	0	0	1	5	11
		Perlodidae	<i>Isoperla</i>	1	0	0	0	0	0	1
			<i>Krogotus</i>	1	0	0	0	0	0	1
	Trichoptera	Limnephilidae	<i>Moselyana</i>	2	1	1	2	2	3	11
		Rhyacophilidae	<i>Rhyacophila</i>	0	3	0	0	0	1	4
	Diptera	Chironomidae	unidentified	41	22	48	5	9	27	152
		Simuliidae	<i>Prosimulium</i>	1	2	1	0	1	0	5
		Tipulidae	<i>Molophilus</i>	0	0	0	0	0	1	1
	Lepidoptera	Crambidae	unidentified	0	0	0	0	0	0	0
Arachnida (mites)	unidentified	unidentified	unidentified	0	0	1	0	2	2	5
Entognatha	Collembola	unidentified	unidentified	1	0	0	0	0	0	1
Gastropoda	unidentified	unidentified	unidentified	0	0	0	0	1	0	1
Oligochaeta	unidentified	unidentified	unidentified	3	7	0	2	0	5	17
Ostracoda	unidentified	unidentified	unidentified	0	1	1	0	1	4	7
Arachnida (spiders)	unidentified	unidentified	unidentified	0	1	0	1	0	1	3
Misc. Terrestrial	unidentified	unidentified	unidentified	6	2	3		4	1	16
Total Aquatic Organisms				133	123	84	36	75	197	649

Appendix C.6.–Lower Sarah Creek BMI
sample summaries, 2024–2025.

	2024	2025
Total BMI taxa	26	22
Number of EPT taxa	13	14
Total counts		
Ephemeroptera	134	418
Plecoptera	12	27
Trichoptera	16	15
Aquatic Diptera	90	158
Other organisms	71	31
% Ephemeroptera	41.5%	64.5%
% Plecoptera	3.7%	4.2%
% Trichoptera	5.0%	2.3%
% Aquatic Diptera	27.9%	24.4%
% Other organisms	22.0%	4.8%
% EPT	50.2%	70.9%
% Chironomidae	25.4%	23.4%
Total aquatic invertebrates	323	649
Total terrestrial invertebrates	27	16
Total invertebrates	350	665
% Sample aquatic	92.3%	97.6%
% Sample terrestrial	7.7%	2.4%
Total sample area (m ²)	0.558	0.558
Mean BMI density (per m ²)	579	1163.1
±1 SD	298	599.7

Appendix C.7.–Upper Sarah Creek BMI sample data, 2025.

Class or Subclass	Order	Family	Genus	Sample Number						Total
				1	2	3	4	5	6	
Insecta	Ephemeroptera	Amelitidae	<i>Ameletus</i>	0	ND	0	2	0	0	2
		Baetidae	<i>Baetis</i>	125	ND	47	119	142	58	491
		Ephemerellidae	<i>Drunella</i>	29	ND	11	37	17	20	114
		Heptageniidae	<i>Cinygmula</i>	4	ND	7	0	4	2	17
			<i>Epeorus</i>	5	ND	0	1	6	4	16
			<i>Rhithrogena</i>	2	ND	4	1	6	0	13
	Plecoptera	Capniidae	<i>Capnia</i>	2	ND	0	0	0	0	2
		Chloroperlidae	<i>Suwallia</i>	2	ND	3	0	0	0	5
		Leuctridae	<i>Despaxia</i>	1	ND	7	0	0	0	8
		Nemouridae	<i>Zapada</i>	12	ND	2	0	3	5	22
		Perlodidae	<i>Kogotus</i>	0	ND	0	0	0	1	1
	Trichoptera	Brachycentridae	<i>Micrasema</i>	1	ND	0	0	0	0	1
		Glossosomatidae	<i>Glossosoma</i>	0	ND	1	0	0	0	1
		Limnephilidae	<i>Desmona</i>	1	ND	0	0	0	0	1
			<i>Moselyana</i>	6	ND	0	2	1	3	12
		Rhyacophilidae	<i>Rhyacophila</i>	7	ND	8	20	7	3	45
	Diptera	Chironomidae	unidentified	66	ND	46	158	30	78	378
		Empididae	<i>Chelifera</i>	28	ND	9	39	5	0	81
		Simuliidae	<i>Prosimulium</i>	7	ND	2	4	2	2	17
		Tipulidae	<i>Dicranota</i>	1	ND	3	0	1	1	6
			<i>Gonomyia</i>	0	ND	4	0	0	0	4
			<i>Hesperoconopa</i>	12	ND	0	0	1	0	13
			unidentified	1	ND	0	0	0	0	1
		unidentified	unidentified	1	ND	0	0	0	0	1
	Coleoptera	unidentified	unidentified	0	ND	0	1	0	0	1
Arachnida (mites)	unidentified	unidentified	unidentified	1	ND	0	0	0	0	1
Entognatha	Collembola	unidentified	unidentified	1	ND	0	0	0	1	2
Oligochaeta	unidentified	unidentified	unidentified	31	ND	17	144	36	164	392
Ostracoda	unidentified	unidentified	unidentified	9	ND	3	5	0	4	21
Juvenile fish	unidentified	unidentified	unidentified	0	ND	0	1	0	0	1
Misc. Terrestrial	unidentified	unidentified	unidentified	1	ND	2	0	1	0	4
Total Aquatic Organisms				355	ND	174	533	261	346	1669

Appendix C.8.—Upper Sarah Creek BMI
sample summaries, 2024–2025.

	2024	2025
Total BMI taxa	30	28
Number of EPT taxa	16	16
Total counts		
Ephemeroptera	611	653
Plecoptera	16	38
Trichoptera	25	60
Aquatic Diptera	132	501
Other organisms	89	417
% Ephemeroptera	70.0%	39%
% Plecoptera	1.8%	2%
% Trichoptera	2.9%	4%
% Aquatic Diptera	15.1%	30%
% Other organisms	10.2%	25%
% EPT	74.7%	45%
% Chironomidae	12.8%	22%
Total aquatic invertebrates	873	1669
Total terrestrial invertebrates	16	4
Total invertebrates	889	1669
% Sample aquatic	98.2%	99.8%
% Sample terrestrial	1.8%	0.2%
Total sample area (m ²)	0.558	0.465
Mean BMI density (per m ²)	1,565	3589
±1 SD	427	1434

Appendix C.9.–Plateau Creek BMI sample data, 2025.

Class or Subclass	Order	Family	Genus	Sample Number						Total
				1	2	3	4	5	6	
Insecta	Ephemeroptera	Amelitidae	<i>Ameletus</i>	0	0	1	2	0	0	3
		Baetidae	<i>Baetis</i>	141	221	54	160	81	27	684
		Ephemerellidae	<i>Drunella</i>	9	8	2	6	7	2	34
		Heptageniidae	<i>Cinygmula</i>	46	17	9	38	28	14	152
			<i>Epeorus</i>	1	0	0	2	2	1	6
			<i>Rhithrogena</i>	1	3	4	4	4	1	17
		Leptophlebiidae	<i>Paraleptophlebia</i>	3	0	0	3	1	1	8
	Plecoptera	Chloroperlidae	<i>Kathroperla</i>	3	2	0	0	0	0	5
			<i>Suwallia</i>	28	7	8	20	15	6	84
		Leuctridae	<i>Despaxia</i>	67	42	21	36	54	42	262
		Nemouridae	<i>Zapada</i>	20	12	5	6	5	7	55
	Trichoptera	Brachycentridae	<i>Micrasema</i>	0	12	0	0	0	0	12
		Glossosomatidae	<i>Glossosoma</i>	5	0	7	11	14	7	44
		Hydropsychidae	<i>Parapsyche</i>	0	2	0	0	0	0	2
		Limnephilidae	<i>Apatania</i>	0	0	0	0	0	1	1
		Rhyacophilidae	<i>Himalapsyche</i>	3	0	0	0	0	0	3
			<i>Rhyacophila</i>	14	6	2	6	4	2	34
	Diptera	Chironomidae	unidentified	159	84	49	111	285	159	847
		Empididae	<i>Oreogeton</i>	16	0	3	4	5	0	28
		Simuliidae	<i>Prosimulium</i>	0	5	0	0	0	0	5
		Tipulidae	<i>Dicranota</i>	2	0	1	0	7	3	13
			<i>Limonia</i>	0	0	1	0	0	0	1
			<i>Molophilus</i>	0	0	0	0	0	1	1
Arachnida (mites)	unidentified	unidentified	unidentified	1	0	0	0	0	0	1
Entognatha	Collembola	unidentified	unidentified	0	0	0	1	0	0	1
Oligochaeta	unidentified	unidentified	unidentified	2	0	0	1	0	1	4
Ostracoda	unidentified	unidentified	unidentified	6	0	12	6	0	5	29
Arachnida (spiders)	unidentified	unidentified	unidentified	0	0	0	0	0	1	1
Misc. Terrestrial	unidentified	unidentified	unidentified	2	1	3	10	11	21	48
Total Aquatic Organisms				527	421	179	417	512	280	2337

Appendix C.10.—Plateau Creek BMI sample summaries, 2024–2025.

	2024	2025
Total BMI taxa	25	28
Number of EPT taxa	14	18
Total counts		
Ephemeroptera	162	904
Plecoptera	123	406
Trichoptera	25	98
Aquatic Diptera	179	894
Other organisms	32	35
% Ephemeroptera	31.1%	38.7%
% Plecoptera	23.6%	17.4%
% Trichoptera	4.8%	4.2%
% Aquatic Diptera	34.4%	38.3%
% Other organisms	6.1%	1.5%
% EPT	59.5%	60.2%
% Chironomidae	31.5%	36.2%
Total aquatic invertebrates	521	2337
Total terrestrial invertebrates	8	48
Total invertebrates	529	2385
% Sample aquatic	98.5%	98.0%
% Sample terrestrial	1.5%	2.0%
Total sample area (m ²)	0.558	0.558
Mean BMI density (per m ²)	934	4188
±1 SD	462	1457

**APPENDIX D: RESIDENT FISH DATA AND
LABORATORY REPORT**

Appendix D.1.–Lower Glacier Creek whole body fish elements concentrations, 2016–2025.

Sample Date	Species	Length (mm)	Weight (g)	Condition (<i>K</i>)	Ag (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cu (mg/kg)	Hg (mg/kg)	Pb (mg/kg)	Se (mg/kg)	Zn (mg/kg)
6/7/2016	DV	108	12.7	1.0	<0.019	<0.48	0.429	3.55	0.0466	0.076	7.23	153
6/7/2016	DV	68	4.8	1.5	<0.020	<0.50	0.501	3.75	0.0330	0.182	7.60	173
6/7/2016	DV	112	17.7	1.3	0.025	<0.48	1.310	3.63	0.0567	0.230	5.48	145
6/7/2016	DV	105	15.9	1.4	<0.019	<0.48	0.585	3.23	0.0509	0.078	7.56	150
6/7/2016	DV	113	14.3	1.0	<0.020	0.50	0.420	3.42	0.0427	0.177	6.21	154
6/7/2016	DV	94	10.8	1.3	<0.019	0.52	0.441	4.35	0.0381	0.195	7.83	167
6/7/2016	DV	109	14.6	1.1	0.026	<0.50	1.250	5.20	0.0683	0.362	6.46	238
6/7/2016	DV	97	11.2	1.2	<0.019	<0.49	0.641	3.71	0.0401	0.172	6.11	154
6/8/2016	DV	93	9.5	1.2	<0.020	<0.49	0.960	3.32	0.0349	0.091	7.04	141
6/8/2016	DV	73	4.7	1.2	0.025	0.54	0.730	4.67	0.0353	0.360	6.31	168
6/8/2017	DV	133	29.1	1.2	0.023	<0.50	0.727	4.47	0.0599	0.109	6.00	184
6/8/2017	DV	113	15.7	1.1	<0.020	<0.50	0.426	3.69	0.0505	0.027	7.01	148
6/8/2017	DV	105	12.6	1.1	<0.020	<0.50	0.601	3.23	0.0523	0.038	7.16	134
6/8/2017	DV	90	9.2	1.3	0.038	<0.50	1.230	3.24	0.0473	0.088	8.33	123
6/8/2017	DV	106	12.8	1.1	<0.020	<0.50	0.606	4.06	0.0532	0.104	9.09	153
6/8/2017	DV	175	60.5	1.1	<0.020	<0.50	0.355	4.71	0.0924	0.119	6.90	162
6/8/2017	DV	75	5.7	1.4	<0.020	<0.50	0.429	4.77	0.0438	0.202	7.86	157
6/8/2017	DV	110	17.3	1.3	0.025	<0.50	0.736	4.35	0.0446	0.074	9.03	126
6/8/2017	DV	59, 118 ^a	20.2	ND	<0.020	<0.50	0.472	4.20	0.0456	0.119	7.30	160
6/8/2017	DV	102, 70 ^a	15.6	ND	<0.020	<0.50	0.865	4.55	0.0642	0.196	7.62	130
5/30/2018	DV	112	12.3	0.9	<0.020	<0.50	0.183	3.26	0.0511	0.042	5.14	114
5/30/2018	DV	66, 65 ^a	4.7	ND	<0.034	<0.84	0.458	5.30	0.0467	0.098	5.90	142
5/30/2018	DV	109	15.1	1.2	<0.020	<0.50	0.257	4.34	0.0592	0.080	6.70	121
5/30/2018	DV	103	11.6	1.1	<0.020	<0.50	0.272	4.05	0.0426	0.108	7.04	132
5/30/2018	DV	78, 65 ^a	7.0	ND	<0.020	<0.50	0.545	5.03	0.0589	0.136	6.19	182
5/30/2018	DV	97	7.8	0.9	<0.020	<0.50	0.558	5.04	0.0529	0.165	6.25	160
5/30/2018	DV	61, 63 ^a	4.1	ND	<0.15	<3.7	0.710	5.29	0.0511	0.170	7.30	158
5/30/2018	DV	92	6.5	0.8	<0.020	<0.50	0.512	5.74	0.0545	0.207	5.47	175
5/30/2018	DV	81	4.5	0.8	<0.024	<0.59	0.440	4.43	0.0496	0.080	6.50	150
5/30/2018	DV	106	12.2	1.0	<0.020	<0.50	0.284	4.91	0.0530	0.087	5.76	149

a Composite sample of two fish.

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Appendix D.1.–Continued.

Sample Date	Species	Length (mm)	Weight (g)	Condition (K)	Ag (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cu (mg/kg)	Hg (mg/kg)	Pb (mg/kg)	Se (mg/kg)	Zn (mg/kg)
6/6/2019	DV	122	22.9	1.3	<0.020	<0.50	0.237	4.07	0.0546	0.110	5.83	158
6/6/2019	DV	124	22.7	1.2	<0.019	<0.48	0.349	3.63	0.0440	0.082	5.87	117
6/6/2019	DV	155	42.5	1.1	<0.020	<0.50	0.514	5.79	0.0510	0.180	6.27	207
6/6/2019	DV	97	12.3	1.3	<0.020	<0.50	0.372	5.58	0.0341	0.137	7.32	156
6/6/2019	DV	121	20.8	1.2	<0.020	<0.49	0.353	2.87	0.0496	0.144	5.82	116
6/6/2019	DV	106	15.0	1.3	<0.019	<0.47	0.259	4.42	0.0540	0.168	6.95	134
6/6/2019	DV	105	13.6	1.2	<0.020	<0.49	0.300	3.37	0.0368	0.109	5.95	115
6/6/2019	DV	117	19.7	1.2	<0.020	<0.50	0.665	4.86	0.0428	0.206	6.02	150
6/6/2019	DV	141	27.1	1.0	<0.019	<0.48	0.440	4.87	0.0457	0.158	6.68	148
6/6/2019	DV	126	25.5	1.3	<0.020	<0.50	0.442	5.18	0.0549	0.129	5.69	188
6/3/2020	DV	115	14.8	1.0	<0.020	<0.49	0.223	4.15	0.0517	0.053	5.92	149
6/3/2020	DV	98	11.2	1.2	<0.020	<0.50	0.657	4.10	0.0412	0.051	5.55	134
6/3/2020	DV	110	15.4	1.2	<0.020	<0.50	0.29	4.03	0.0425	0.076	5.72	160
6/3/2020	DV	99	11.9	1.2	<0.020	<0.49	0.446	4.77	0.0455	0.178	6.75	132
6/3/2020	DV	123	19.9	1.1	<0.019	<0.49	0.467	4.91	0.0458	0.055	5.82	139
6/3/2020	DV	113	14.7	1.0	0.021	<0.49	1.29	5.81	0.0429	0.120	6.50	144
6/3/2020	DV	107	14.0	1.1	<0.020	<0.50	0.309	4.36	0.0412	0.069	5.95	141
6/3/2020	DV	113	15.8	1.1	<0.020	<0.50	0.312	5.49	0.0509	0.085	5.95	143
6/3/2020	DV	112	15.6	1.1	<0.020	<0.50	0.359	3.43	0.0369	0.045	7.10	150
6/3/2020	DV	122	18.3	1.0	<0.020	<0.50	0.286	4.62	0.0537	0.097	6.00	146
6/16/2021	DV	113	13.5	0.9	<0.020	<0.49	1.05	6.69	0.0630	0.278	6.49	214
6/16/2021	DV	110	14.9	1.1	<0.020	<0.49	0.873	7.06	0.0476	0.357	5.57	216
6/16/2021	DV	142	30.6	1.1	<0.020	<0.49	0.404	4.17	0.0829	0.120	6.17	136
6/16/2021	DV	100	13.2	1.3	<0.020	<0.50	0.413	3.63	0.0551	0.094	5.68	124
6/16/2021	DV	103	14.2	1.3	<0.019	<0.49	0.375	3.76	0.0465	0.055	5.78	115
6/16/2021	DV	137	33.3	1.3	<0.020	<0.49	0.188	3.27	0.0573	0.078	4.66	119
6/16/2021	DV	138	27.9	1.1	<0.020	<0.50	0.556	4.41	0.0720	0.080	6.21	136
6/16/2021	DV	123	21.8	1.2	<0.020	<0.50	0.276	3.56	0.0430	0.063	6.64	106
6/16/2021	DV	149	34.9	1.1	<0.020	<0.50	0.351	4.34	0.0509	0.062	5.26	113
6/16/2021	DV	128	23.3	1.1	<0.020	<0.50	0.434	4.31	0.0443	0.170	4.85	105
6/13/2022	DV	133	35.5	1.5	<0.020	<0.50	0.447	4.08	0.0511	0.064	3.95	109
6/13/2022	DV	148	40.0	1.2	<0.020	<0.50	0.227	3.76	0.0737	0.031	5.14	133
6/13/2022	DV	93	9.2	1.1	<0.020	<0.50	0.360	3.31	0.0513	0.062	5.88	127
6/13/2022	DV	144	36.4	1.2	<0.020	<0.50	0.443	4.88	0.0482	0.052	5.18	121
6/13/2022	DV	113	17.3	1.2	<0.020	<0.50	0.595	3.55	0.0424	0.063	5.40	117
6/13/2022	DV	107	17.5	1.4	<0.020	<0.50	1.680	4.48	0.0473	0.220	5.89	124
6/13/2022	DV	100	13.2	1.3	0.053	<0.50	0.876	6.58	0.0551	0.507	6.99	176
6/13/2022	DV	115	16.5	1.1	<0.020	<0.50	0.254	3.20	0.0612	0.060	5.27	115
6/13/2022	DV	107	16.0	1.3	<0.020	<0.50	1.020	5.07	0.0397	0.220	6.47	129
6/13/2022	DV	102	13.3	1.3	0.022	<0.50	1.100	5.17	0.0479	0.150	6.13	147

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Appendix D.1.–Continued.

Sample		Length	Weight	Condition	Ag	As	Cd	Cu	Hg	Pb	Se	Zn
Date	Species	(mm)	(g)	(K)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
6/7/2023	DV	130	27.9	1.3	<0.020	<0.49	0.281	4.59	0.0350	0.092	4.52	95.8
6/7/2023	DV	104	14.0	1.2	<0.020	<0.50	0.323	4.82	0.0516	0.188	5.72	133
6/7/2023	DV	136	29.5	1.2	<0.020	<0.49	0.252	3.19	0.0382	0.136	6.96	121
6/7/2023	DV	106	13.1	1.1	<0.020	<0.49	0.400	5.57	0.0415	0.273	5.55	197
6/7/2023	DV	105	13.8	1.2	<0.020	<0.50	0.270	9.55	0.0259	0.218	6.20	127
6/7/2023	DV	103	9.8	0.9	<0.020	<0.49	0.319	4.16	0.0382	0.162	6.17	126
6/7/2023	DV	115	14.9	1.0	<0.020	<0.49	0.806	4.31	0.0483	0.228	6.13	146
6/7/2023	DV	98	10.6	1.1	0.026	<0.49	0.791	5.31	0.0496	0.240	5.79	143
6/7/2023	DV	112	17.6	1.3	<0.020	<0.50	0.487	5.91	0.0374	0.196	6.53	167
6/7/2023	DV	94	8.1	1.0	<0.020	<0.50	0.695	6.11	0.0548	0.220	4.81	155
6/20/2024	DV	118	18.8	1.1	<0.196	0.3120	0.233	4.13	<0.039	<0.196	5.52	147
6/20/2024	DV	105	14.9	1.3	<0.200	0.2929	0.265	3.99	<0.040	<0.200	5.77	104
6/20/2024	DV	96	10.1	1.1	<0.206	<0.206	0.270	3.78	<0.040	<0.206	5.02	124
6/20/2024	DV	122	18.7	1.0	<0.218	0.3457	0.462	5.30	<0.043	<0.218	5.47	189
6/20/2024	DV	85	7.8	1.3	<0.202	0.3390	0.474	4.06	<0.040	<0.202	5.82	138
6/20/2024	DV	111	16.9	1.2	<0.208	0.3061	0.270	4.65	<0.041	<0.208	5.88	147
6/20/2024	DV	108	15.7	1.2	<0.207	0.2776	0.259	4.41	<0.041	<0.207	5.22	111
6/20/2024	DV	78	6.8	1.4	<0.222	0.3167	0.447	5.13	<0.044	<0.222	4.07	132
6/20/2024	DV	128	23.1	1.1	<0.191	0.2598	0.402	4.89	<0.038	<0.191	5.23	128
6/20/2024	DV	136	30.5	1.2	<0.196	0.2638	0.254	4.09	0.0393	<0.196	4.55	112
6/12/2025	DV	99	9.5	1.0	<0.227	<0.227	0.462	2.93	0.0627	<0.227	6.04	121
6/12/2025	DV	122	19.5	1.1	<0.205	0.4160	0.860	3.16	0.0808	<0.205	6.68	231
6/12/2025	DV	108	15.5	1.2	<0.224	<0.224	0.272	3.07	0.0663	<0.224	7.53	107
6/12/2025	DV	117	18.2	1.1	<0.205	0.3096	0.280	3.68	0.0712	<0.205	5.88	152
6/12/2025	DV	108	12.4	1.0	<0.207	0.2254	0.676	4.39	0.0607	<0.207	8.65	167
6/12/2025	DV	110	13.2	1.0	<0.229	<0.229	0.259	3.58	0.0565	<0.229	4.91	131
6/12/2025	DV	82	5.1	0.9	<0.236	<0.236	0.443	5.33	<0.047	<0.236	5.79	117
6/12/2025	DV	82	5.9	1.1	<0.227	0.6975	1.118	5.80	0.0765	0.458	6.01	252
6/12/2025	DV	76	4.4	1.0	<0.220	0.5328	0.607	3.78	0.0515	<0.220	9.48	181
6/12/2025	DV	75	5.64	1.3	<0.247	<0.247	0.320	3.54	0.0459	<0.247	5.77	159

Appendix D.2.–Middle Glacier Creek whole body fish elements concentrations, 2016–2025.

Sample Date	Species	Length (mm)	Weight (g)	Condition (K)	Ag (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cu (mg/kg)	Hg (mg/kg)	Pb (mg/kg)	Se (mg/kg)	Zn (mg/kg)
6/8/2016	DV	150	36.0	1.1	0.031	<0.48	0.605	3.37	0.0429	0.069	5.66	143
6/8/2016	DV	108	15.9	1.3	<0.020	<0.50	0.327	4.33	0.0337	0.183	6.91	147
6/8/2016	DV	123	26.5	1.4	<0.020	<0.50	0.683	3.83	0.0301	0.717	5.64	117
6/8/2016	DV	73	5.2	1.3	<0.020	<0.49	0.288	4.99	0.0260	0.128	3.94	128
6/8/2016	DV	180	66.7	1.1	<0.020	<0.50	0.329	3.11	0.0376	0.061	5.17	132
6/8/2016	DV	77	6.0	1.3	<0.020	<0.50	0.215	3.53	0.0259	0.259	4.80	146
6/8/2016	DV	83	7.8	1.4	<0.020	<0.50	0.280	3.75	0.0247	0.182	6.05	132
6/8/2016	DV	146	31.5	1.0	<0.020	<0.50	0.521	2.50	0.0299	0.062	4.90	103
6/8/2016	DV	83	7.0	1.2	<0.020	<0.50	0.678	2.56	0.0328	0.046	4.66	139
6/8/2016	DV	70	5.0	1.5	0.682	<0.50	0.257	2.63	0.0184	0.036	6.29	133
6/9/2017	DV	154	45.5	1.2	<0.020	<0.50	0.267	3.29	0.0364	0.036	5.14	116
6/9/2017	DV	130	24.3	1.1	<0.020	<0.50	0.333	3.23	0.0343	0.056	6.86	95
6/9/2017	DV	210	115.0	1.2	<0.020	<0.50	0.758	7.67	0.0701	0.031	6.34	161
6/9/2017	DV	141	34.7	1.2	<0.020	<0.50	0.291	3.33	0.0430	0.037	8.02	126
6/9/2017	DV	131	24.3	1.1	<0.020	<0.50	0.299	3.26	0.0385	0.100	6.10	128
6/9/2017	DV	90	7.4	1.0	<0.020	<0.50	0.343	2.40	0.0361	0.034	6.86	101
5/31/2018	DV	171	55.9	1.1	<0.020	<0.50	0.696	15.20	0.0641	0.080	6.56	176
5/31/2018	DV	138	28.3	1.1	<0.020	<0.50	0.541	6.22	0.0659	0.044	5.30	114
5/31/2018	DV	58, 57 ^a	4.2	ND	<0.082	<2.0	0.357	4.25	0.0191	0.087	4.90	114
5/31/2018	DV	188	76.2	1.1	0.027	<0.50	0.889	12.70	0.0487	0.143	6.22	140
5/31/2018	DV	175	58.1	1.1	<0.020	<0.50	0.612	5.47	0.0296	0.107	5.20	108
5/31/2018	DV	100	11.2	1.1	0.029	<0.50	0.802	5.07	0.0676	0.122	6.72	146
6/7/2019	DV	65, 65 ^a	8.3	ND	<0.020	<0.50	0.501	3.89	0.0157	0.053	5.81	117
6/7/2019	DV	72, 70 ^a	10.2	ND	<0.020	<0.50	0.615	3.91	0.0241	0.073	5.30	101
6/7/2019	DV	141	36.9	1.3	<0.019	<0.48	0.354	3.16	0.0468	<0.019	5.46	116
6/7/2019	DV	185	88.4	1.4	<0.020	<0.49	0.785	3.42	0.1060	0.050	5.16	161
6/7/2019	DV	67, 69 ^a	8.6	ND	<0.020	<0.50	0.438	3.55	0.0199	0.109	5.60	105
6/7/2019	DV	166	47.4	1.0	<0.019	<0.48	0.280	3.73	0.0528	0.091	5.47	115
6/7/2019	DV	87	8.7	1.3	<0.019	<0.48	0.231	2.39	0.0260	0.028	5.54	89
6/7/2019	DV	100	14.9	1.5	<0.020	<0.49	0.260	3.41	0.0356	0.163	5.43	100
6/7/2019	DV	75, 77 ^a	11.6	ND	0.984	<0.48	0.337	3.94	0.0254	0.179	5.18	106
6/7/2019	DV	75, 75 ^a	8.4	ND	<0.019	<0.48	0.547	3.68	0.0331	0.120	5.25	89

a Composite sample of two fish.

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Appendix D.2.–Continued.

Sample		Length	Weight	Condition	Ag	As	Cd	Cu	Hg	Pb	Se	Zn
Date	Species	(mm)	(g)	(K)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
6/2/2020	DV	141	30.3	1.1	<0.019	<0.49	0.251	3.45	0.0465	0.054	5.38	162
6/2/2020	DV	142	35.4	1.2	<0.020	<0.50	0.182	3.73	0.0396	0.127	4.12	125
6/2/2020	DV	118	20.1	1.2	<0.020	<0.49	0.344	4.97	0.0327	0.219	5.04	131
6/2/2020	DV	108	14.4	1.1	<0.020	<0.49	0.373	5.07	0.0326	0.216	4.81	144
6/2/2020	DV	119	18.4	1.1	<0.020	<0.49	0.314	4.19	0.0302	0.094	5.55	112
6/2/2020	DV	111	14.6	1.1	<0.019	<0.49	0.249	3.79	0.0326	0.151	4.94	129
6/15/2021	DV	140	37.2	1.4	0.022	<0.50	1.11	9.25	0.0503	0.170	5.21	132
6/15/2021	DV	148	51.0	1.6	<0.020	<0.50	0.431	4.95	0.0505	0.080	4.30	99
6/15/2021	DV	158	48.2	1.2	<0.020	<0.49	0.348	6.37	0.0656	0.057	4.87	136
6/15/2021	DV	163	54.0	1.2	<0.020	<0.49	0.204	3.95	0.0416	0.031	4.50	89
6/15/2021	DV	135	32.8	1.3	<0.020	<0.49	0.286	5.99	0.0574	0.095	4.68	111
6/14/2022	DV	95	10.0	1.2	<0.020	<0.49	0.400	3.5	0.0132	0.038	5.44	94
6/6/2023	DV	153	47.2	1.3	0.021	<0.50	0.485	4.20	0.0402	0.110	4.8	119
6/6/2023	DV	105	17.9	1.5	<0.020	<0.49	0.453	3.99	0.0215	0.104	4.24	107
6/6/2023	DV	148	43.0	1.3	0.022	<0.50	0.958	3.85	0.0416	0.076	4.18	95
6/6/2023	DV	144	33.7	1.1	0.031	<0.49	0.569	4.16	0.0610	0.416	4.46	109
6/6/2023	DV	95	9.9	1.2	<0.020	<0.49	0.406	4.39	0.0178	0.087	6.87	119
6/20/2024	DV	140	37.8	1.4	<0.191	0.276	0.529	4.96	0.0357	<0.191	6.25	113
6/20/2024	DV	122	22.5	1.2	<0.207	0.258	0.548	4.40	0.0403	<0.207	5.97	137
6/20/2024	DV	105	12.9	1.1	<0.220	0.266	0.429	4.33	0.0429	<0.220	6.01	123
6/20/2024	DV	76	5.6	1.3	<0.233	0.245	0.277	3.38	0.0442	<0.233	4.47	133
6/20/2024	DV	81	5.6	1.1	<0.213	0.244	0.307	4.32	0.0424	<0.213	5.68	145
6/20/2024	DV	93	9.1	1.1	<0.220	<0.22	<0.22	2.88	0.0413	<0.220	4.55	116
6/10/2025	DV	91	9.4	1.3	<0.276	0.892	1.114	3.97	<0.054	<0.276	5.57	125

Appendix D.3.–Lower Sarah Creek whole body fish elements concentrations, 2024–2025.

Sample		Length	Weight	Condition	Ag	As	Cd	Cu	Hg	Pb	Se	Zn
Date	Species	(mm)	(g)	(K)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
6/20/2024	CO	82	6.6	1.2	<0.215	<0.215	<0.215	4.10	<0.0424	<0.215	5.68	117
6/20/2024	DV	97	9.2	1.0	<0.218	0.218	0.270	3.06	<0.0427	0.256	5.00	173
6/20/2024	DV	94	11.3	1.4	<0.232	0.259	<0.232	4.20	0.0711	<0.232	5.46	120
6/20/2024	DV	90	9.8	1.3	<0.205	<0.205	<0.205	2.39	0.0663	<0.205	4.76	108
6/20/2024	DV	75	4.8	1.1	<0.221	<0.221	<0.221	5.35	0.0478	<0.221	5.79	131
6/20/2024	DV	76	5.0	1.1	<0.222	<0.222	<0.222	3.99	0.0987	<0.222	5.09	139
6/11/2025	DV	121	18.7	1.1	<0.236	<0.236	0.242	2.79	0.0570	<0.236	7.52	139
6/11/2025	DV	100	10.2	1.0	<0.270	<0.270	<0.270	3.38	0.0585	<0.270	8.55	134
6/11/2025	DV	112	16.5	1.2	<0.228	<0.228	0.308	3.00	0.1792	<0.228	4.49	73
6/11/2025	CT	88	7.0	1.0	<0.273	<0.273	<0.273	2.13	0.1850	<0.273	3.81	123

Appendix D.4.–Upper Sarah Creek whole body fish elements concentrations, 2024–2025.

Sample		Length	Weight	Condition	Ag	As	Cd	Cu	Hg	Pb	Se	Zn
Date	Species	(mm)	(g)	(K)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
6/20/2024	DV	110	13.1	1.0	<0.217	<0.217	0.352	3.68	<0.0431	<0.217	8.10	131
6/20/2024	DV	111	15.5	1.1	<0.222	0.280	0.297	3.45	<0.0437	<0.222	4.59	148
6/20/2024	DV	99	8.3	0.9	<0.211	0.213	0.265	3.54	<0.0420	<0.211	9.37	145
6/20/2024	DV	88	6.9	1.0	<0.206	0.229	0.271	3.69	<0.0408	<0.206	4.16	100
6/20/2024	DV	103	9.7	0.9	<0.220	0.286	0.245	4.10	<0.0437	<0.220	3.41	124
6/20/2024	DV	84	5.6	0.9	<0.233	<0.233	0.385	4.58	<0.0463	<0.233	4.68	138
6/20/2024	DV	125	24.1	1.2	<0.222	<0.222	0.340	5.44	0.0496	<0.222	3.72	140
6/20/2024	DV	86	7.7	1.2	<0.226	0.289	0.300	3.16	<0.0446	<0.226	4.91	137
6/20/2024	DV	80	6.0	1.2	<0.236	0.342	<0.236	2.53	<0.0463	<0.236	4.10	124
6/20/2024	DV	108	12.2	1.0	<0.230	<0.230	0.288	3.47	<0.0455	<0.230	6.64	170
6/11/2025	DV	103	10.6	1.0	<0.236	0.272	0.455	3.94	0.0493	<0.236	4.65	138
6/11/2025	DV	93	9.1	1.1	<0.245	0.249	1.205	6.39	<0.046	<0.245	8.81	116
6/11/2025	DV	107	14.9	1.2	<0.235	<0.235	0.275	4.08	<0.047	<0.235	4.02	131
6/11/2025	DV	120	16.6	1.0	<0.246	<0.246	0.256	3.73	<0.0480	<0.246	5.43	96
6/11/2025	DV	90	9.9	1.4	<0.266	0.273	<0.266	2.47	<0.0500	<0.266	7.81	131
6/11/2025	DV	86	7.3	1.1	<0.292	<0.292	<0.292	3.09	<0.0540	<0.292	11.19	159
6/11/2025	DV	83	6.8	1.2	<0.284	<0.284	0.550	4.19	<0.0530	<0.284	4.40	160
6/11/2025	DV	95	11.3	1.3	<0.289	<0.289	0.297	3.10	<0.0530	<0.289	6.15	99
6/11/2025	DV	98	9.9	1.0	<0.272	<0.272	<0.272	2.35	<0.0530	<0.272	3.68	145
6/11/2025	DV	101	10.1	1.0	<0.274	<0.274	0.501	3.89	<0.0530	<0.274	5.27	166

Appendix D.5.–Plateau Creek whole body fish elements concentrations, 2024–2025.

Sample		Length	Weight	Condition	Ag	As	Cd	Cu	Hg	Pb	Se	Zn
Date	Species	(mm)	(g)	(K)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
6/19/2024	DV	120	17.4	1.0	<0.215	0.246	0.33	3.50	0.0747	<0.215	2.51	144
6/19/2024	DV	90	6.1	0.8	<0.223	0.244	0.50	4.05	0.0615	<0.223	3.66	144
6/19/2024	CT	99	9.9	1.0	<0.226	0.230	0.46	3.96	0.0536	<0.226	2.72	132
6/19/2024	CT	104	10.4	0.9	<0.216	0.216	0.76	4.57	0.0560	<0.216	3.12	136
6/19/2024	CT	85	5.5	0.9	<0.229	0.316	0.49	3.62	0.0541	<0.229	3.23	124
6/19/2024	CT	100	10.1	1.0	<0.224	<0.224	0.36	3.38	0.0621	<0.224	3.45	127
6/19/2024	CT	113	15.0	1.0	<0.225	<0.225	0.46	3.99	0.0637	<0.225	3.08	123
6/19/2024	DV	91	7.3	1.0	<0.238	<0.238	0.47	3.89	0.0939	<0.238	2.23	100
6/19/2024	CT	94	7.6	0.9	<0.240	<0.240	0.39	4.02	0.0783	<0.240	2.22	119
6/19/2024	CT	110	12.5	0.9	<0.229	0.263	0.86	5.45	0.0827	<0.229	3.78	122
6/11/2025	CT	82	5.0	0.9	0.990	0.452	1.49	3.57	0.1295	0.432	5.30	191
6/11/2025	DV	104	11.5	1.0	<0.246	<0.246	0.47	2.10	0.1374	<0.246	2.08	77
6/11/2025	DV	99	8.4	0.9	<0.282	<0.282	0.86	3.97	0.1215	<0.282	3.99	181
6/11/2025	DV	81	6.7	1.3	<0.265	0.319	0.63	3.61	0.0870	<0.265	3.21	128
6/11/2025	DV	81	6.4	1.2	<0.286	0.308	0.82	4.24	0.0937	<0.286	3.37	188
6/11/2025	DV	84	5.6	0.9	<0.331	0.353	1.19	3.86	0.0902	<0.331	4.05	197
6/11/2025	DV	80	6.0	1.2	<0.271	0.288	0.58	3.73	0.0867	<0.271	3.54	121
6/11/2025	CT	83	5.3	0.9	<0.290	0.344	1.42	3.94	0.1225	<0.290	3.96	188
6/11/2025	DV	85	6.0	1.0	<0.294	0.349	0.83	3.24	0.1426	<0.294	2.94	236
6/11/2025	DV	79	5.4	1.1	<0.257	0.339	0.75	4.24	0.1087	<0.257	3.41	148



ANALYTICAL REPORT

Alaska State Environmental Health Laboratory

5251 Dr. Martin Luther King Jr. Avenue

Anchorage, AK 99507

www.dec.alaska.gov/eh/lab

Work Order Number: 2508101

Project Name: Palmer Project at Haines

For:

Constantine

PO Box 315

Haines, AK 99827

Attn: Kris Benusa

A handwritten signature in blue ink, reading "Steve R. Crupi".

Steve R Crupi

Program Coordinator 2

steve.crupi@alaska.gov



Report Date: 01/30/2026

The results in this report apply to the samples analyzed in accordance with the sample submission form. This analytical report must be reproduced in its entirety. This report has been electronically signed and authorized by the signatory.

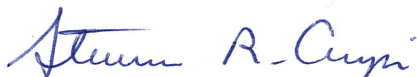
Sample Summary

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/2026 14:10

Lab Sample ID	Client Sample ID	Cooler	Temp C	Collected	Received
2508101-01	LSAR 1	Default Cooler	5.6	6/11/25 12:00 pm	8/19/25 9:40 am
2508101-02	LSAR 2	Default Cooler	5.6	6/11/25 12:00 pm	8/19/25 9:40 am
2508101-03	LSAR 3	Default Cooler	5.6	6/11/25 12:00 pm	8/19/25 9:40 am
2508101-04	LSAR 4	Default Cooler	5.6	6/11/25 12:00 pm	8/19/25 9:40 am
2508101-05	PLAT 1	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-06	PLAT 2	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-07	PLAT 3	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-08	PLAT 4	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-09	PLAT 5	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-10	PLAT 6	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-11	PLAT 7	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-12	PLAT 8	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-13	PLAT 9	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-14	PLAT 10	Default Cooler	5.6	6/11/25 2:30 pm	8/19/25 9:40 am
2508101-15	MGC 1	Default Cooler	5.6	6/10/25 5:00 pm	8/19/25 9:40 am

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Methods

All samples were analyzed and conform with the following methods unless otherwise specified in the Case Narrative:

*** DEFAULT SPECIFIC METHOD ***

Fish prep

SM 2540 G

SW 3051A/6020A

SW 7473

Case Narrative

All results are reported on a 'wet weight basis' or 'as received'.

B

Copper is present in the method blank B25H128-BLK1 (0.123 mg/Kg, RL = 0.05 mg/Kg) as well as in the associated samples 1-4, ranging from 0.412 - 0.675 mg/Kg in the samples. Copper detections in the method blank and the affected samples are flagged with a 'B'. Email conversations with Dylan Krull January 8-9, 2026 acknowledged the comparability of the sample concentrations to prior data, so the decision was made to report the data 'as is'.

HT-REC

The samples were received outside of the holding time for the percent solids test.

J

Concentrations greater than or equal to the detection limit, but less than the reporting limit are flagged with a 'J' and considered an estimated concentration.

Z-REP

The copper recovery in the method reporting limit standard B25H128-MRL1 is above the QC limit (130%). Copper contamination in the lab method blank associated with this standard may explain the high recovery. Copper results in the four associated samples may be biased high.

Alaska State Environmental Health Laboratory



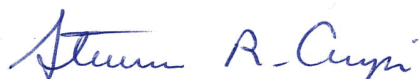
Steve R Crupi, Program Coordinator 2

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Notes and Definitions

Z-REP	B25H128-MRL1 Cu %R>130. Sample results may be biased high.
J	Detected but below the Reporting Limit: therefore, result is an estimated concentration
HT-REC	The sample arrived at the lab outside of the holding time for this test.
B	Analyte is found in the associated blank as well as in the sample.

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Analytical Data

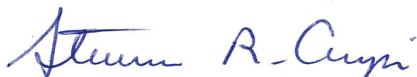
Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: LSAR 1
Lab Sample ID: 2508101-01
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0363	0.0504	0.0112	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0517	0.0504	0.0163	mg/kg	"	"	"	"	"	
Copper	0.596	0.0504	0.0172	mg/kg	"	"	"	"	"	B
Lead	ND	0.0504	0.0219	mg/kg	"	"	"	"	"	
Mercury	0.0122	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	1.61	0.0504	0.00715	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0504	0.0341	mg/kg	"	"	"	"	"	
Zinc	29.8	0.504	0.146	mg/kg	"	"	"	"	"	
% Solids	21.4	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: LSAR 2
Lab Sample ID: 2508101-02
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0297	0.0539	0.0120	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0533	0.0539	0.0174	mg/kg	"	"	"	"	"	J
Copper	0.675	0.0539	0.0184	mg/kg	"	"	"	"	"	B
Lead	ND	0.0539	0.0234	mg/kg	"	"	"	"	"	
Mercury	0.0117	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	1.71	0.0539	0.00765	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0539	0.0364	mg/kg	"	"	"	"	"	
Zinc	26.7	0.539	0.156	mg/kg	"	"	"	"	"	
% Solids	20.0	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

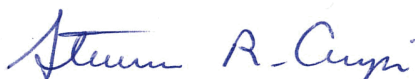
Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: LSAR 3
Lab Sample ID: 2508101-03
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0195	0.0503	0.0112	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0681	0.0503	0.0163	mg/kg	"	"	"	"	"	
Copper	0.664	0.0503	0.0172	mg/kg	"	"	"	"	"	B
Lead	ND	0.0503	0.0218	mg/kg	"	"	"	"	"	
Mercury	0.0396	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.992	0.0503	0.00714	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0503	0.0340	mg/kg	"	"	"	"	"	
Zinc	16.1	0.503	0.146	mg/kg	"	"	"	"	"	
% Solids	22.1	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: LSAR 4
Lab Sample ID: 2508101-04
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0269	0.0527	0.0117	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0283	0.0527	0.0171	mg/kg	"	"	"	"	"	J
Copper	0.412	0.0527	0.0180	mg/kg	"	"	"	"	"	B
Lead	ND	0.0527	0.0229	mg/kg	"	"	"	"	"	
Mercury	0.0357	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.735	0.0527	0.00748	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0527	0.0356	mg/kg	"	"	"	"	"	
Zinc	23.8	0.527	0.153	mg/kg	"	"	"	"	"	
% Solids	19.3	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 1
Lab Sample ID: 2508101-05
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0903	0.0547	0.0121	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.298	0.0547	0.0177	mg/kg	"	"	"	"	"	
Copper	0.714	0.0547	0.0187	mg/kg	"	"	"	"	"	
Lead	0.0864	0.0547	0.0237	mg/kg	"	"	"	"	"	
Mercury	0.0259	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	1.06	0.0547	0.00777	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	0.198	0.0547	0.0370	mg/kg	"	"	"	"	"	
Zinc	38.1	0.547	0.159	mg/kg	"	"	"	"	"	
% Solids	20.0	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 2
Lab Sample ID: 2508101-06
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0518	0.0519	0.0115	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	J
Cadmium	0.0984	0.0519	0.0168	mg/kg	"	"	"	"	"	
Copper	0.444	0.0519	0.0177	mg/kg	"	"	"	"	"	
Lead	ND	0.0519	0.0225	mg/kg	"	"	"	"	"	
Mercury	0.0290	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.439	0.0519	0.00737	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0519	0.0351	mg/kg	"	"	"	"	"	
Zinc	16.3	0.519	0.150	mg/kg	"	"	"	"	"	
% Solids	21.1	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 3
Lab Sample ID: 2508101-07
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0529	0.0550	0.0122	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	J
Cadmium	0.168	0.0550	0.0178	mg/kg	"	"	"	"	"	
Copper	0.775	0.0550	0.0188	mg/kg	"	"	"	"	"	
Lead	ND	0.0550	0.0239	mg/kg	"	"	"	"	"	
Mercury	0.0237	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.779	0.0550	0.00780	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0550	0.0372	mg/kg	"	"	"	"	"	
Zinc	35.2	0.550	0.159	mg/kg	"	"	"	"	"	
% Solids	19.5	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 4
Lab Sample ID: 2508101-08
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0637	0.0530	0.0118	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.126	0.0530	0.0172	mg/kg	"	"	"	"	"	
Copper	0.722	0.0530	0.0181	mg/kg	"	"	"	"	"	
Lead	ND	0.0530	0.0230	mg/kg	"	"	"	"	"	
Mercury	0.0174	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.641	0.0530	0.00753	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0530	0.0359	mg/kg	"	"	"	"	"	
Zinc	25.6	0.530	0.154	mg/kg	"	"	"	"	"	
% Solids	20.0	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 5
Lab Sample ID: 2508101-09
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0585	0.0544	0.0121	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.155	0.0544	0.0176	mg/kg	"	"	"	"	"	
Copper	0.805	0.0544	0.0186	mg/kg	"	"	"	"	"	
Lead	ND	0.0544	0.0236	mg/kg	"	"	"	"	"	
Mercury	0.0178	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.640	0.0544	0.00773	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0544	0.0368	mg/kg	"	"	"	"	"	
Zinc	35.7	0.544	0.158	mg/kg	"	"	"	"	"	
% Solids	19.0	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 6
Lab Sample ID: 2508101-10
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0576	0.0539	0.0120	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.194	0.0539	0.0175	mg/kg	"	"	"	"	"	
Copper	0.629	0.0539	0.0184	mg/kg	"	"	"	"	"	
Lead	ND	0.0539	0.0234	mg/kg	"	"	"	"	"	
Mercury	0.0147	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.660	0.0539	0.00766	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0539	0.0364	mg/kg	"	"	"	"	"	
Zinc	32.1	0.539	0.156	mg/kg	"	"	"	"	"	
% Solids	16.3	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 7
Lab Sample ID: 2508101-11
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0585	0.0550	0.0122	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.117	0.0550	0.0178	mg/kg	"	"	"	"	"	
Copper	0.758	0.0550	0.0188	mg/kg	"	"	"	"	"	
Lead	ND	0.0550	0.0239	mg/kg	"	"	"	"	"	
Mercury	0.0176	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.718	0.0550	0.00781	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0550	0.0372	mg/kg	"	"	"	"	"	
Zinc	24.6	0.550	0.160	mg/kg	"	"	"	"	"	
% Solids	20.3	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 8
Lab Sample ID: 2508101-12
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0612	0.0516	0.0115	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.252	0.0516	0.0167	mg/kg	"	"	"	"	"	
Copper	0.701	0.0516	0.0177	mg/kg	"	"	"	"	"	
Lead	ND	0.0516	0.0224	mg/kg	"	"	"	"	"	
Mercury	0.0218	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.704	0.0516	0.00733	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0516	0.0349	mg/kg	"	"	"	"	"	
Zinc	33.5	0.516	0.150	mg/kg	"	"	"	"	"	
% Solids	17.8	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 9
Lab Sample ID: 2508101-13
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0656	0.0552	0.0123	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.156	0.0552	0.0179	mg/kg	"	"	"	"	"	
Copper	0.609	0.0552	0.0189	mg/kg	"	"	"	"	"	
Lead	ND	0.0552	0.0240	mg/kg	"	"	"	"	"	
Mercury	0.0268	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.552	0.0552	0.00785	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0552	0.0373	mg/kg	"	"	"	"	"	
Zinc	44.3	0.552	0.160	mg/kg	"	"	"	"	"	
% Solids	18.8	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: PLAT 10
Lab Sample ID: 2508101-14
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0705	0.0535	0.0119	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.155	0.0535	0.0173	mg/kg	"	"	"	"	"	
Copper	0.882	0.0535	0.0183	mg/kg	"	"	"	"	"	
Lead	ND	0.0535	0.0232	mg/kg	"	"	"	"	"	
Mercury	0.0226	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	0.710	0.0535	0.00760	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0535	0.0362	mg/kg	"	"	"	"	"	
Zinc	30.8	0.535	0.155	mg/kg	"	"	"	"	"	
% Solids	20.8	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508101
Report Date: 01/30/26 14:10

Client Sample ID: MGC 1
Lab Sample ID: 2508101-15
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.165	0.0511	0.0113	mg/kg	1	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Cadmium	0.206	0.0511	0.0166	mg/kg	"	"	"	"	"	
Copper	0.734	0.0511	0.0175	mg/kg	"	"	"	"	"	
Lead	ND	0.0511	0.0222	mg/kg	"	"	"	"	"	
Mercury	ND	0.0100	0.00480	mg/kg	"	B25H126	18-Sep-25	18-Sep-25	SW 7473	
Selenium	1.03	0.0511	0.00726	mg/kg	"	B25I040	14-Oct-25	14-Jan-26	SW 3051A/6020A	
Silver	ND	0.0511	0.0345	mg/kg	"	"	"	"	"	
Zinc	23.2	0.511	0.148	mg/kg	"	"	"	"	"	
% Solids	18.5	0.100		% by weight	1	B25H124	13-Jan-26	16-Jan-26	SM 2540 G	HT-RE C

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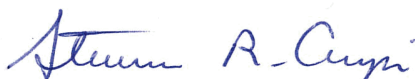
Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B25H126 - EPA 7473										
Blank (B25H126-BLK1)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H126-BLK2)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H126-BLK3)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H126-BLK4)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H126-BLK5)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H126-BLK6)				Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg							
Duplicate (B25H126-DUP1)		Source: 2508101-01		Prepared & Analyzed: 18-Sep-25						
Mercury	0.0111	0.0100	mg/kg		0.0122			9	20	
Duplicate (B25H126-DUP2)		Source: 2508101-15		Prepared & Analyzed: 18-Sep-25						
Mercury	ND	0.0100	mg/kg		ND				20	
MRL Check (B25H126-MRL1)				Prepared: 28-Aug-25 Analyzed: 18-Sep-25						
Mercury	0.0105	0.0100	mg/kg	0.0097669		108	70-130			
Matrix Spike (B25H126-MS1)		Source: 2508101-01		Prepared & Analyzed: 18-Sep-25						
Mercury	0.261	0.0100	mg/kg	0.24994	0.0122	99	71-124			

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H126 - EPA 7473

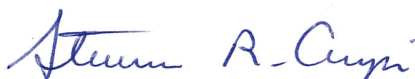
Matrix Spike Dup (B25H126-MSD1)		Source: 2508101-01		Prepared & Analyzed: 18-Sep-25						
Mercury	0.252	0.0100	mg/kg	0.24870	0.0122	96	71-124	4	20	
Reference (B25H126-SRM1)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.308	0.0100	mg/kg	0.31600		97	90-110			
Reference (B25H126-SRM2)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.305	0.0100	mg/kg	0.31600		96	90-110			
Reference (B25H126-SRM3)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.307	0.0100	mg/kg	0.31600		97	80-120			
Reference (B25H126-SRM4)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.307	0.0100	mg/kg	0.31600		97	80-120			
Reference (B25H126-SRM5)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.298	0.0100	mg/kg	0.31600		94	80-120			
Reference (B25H126-SRM6)				Prepared & Analyzed: 18-Sep-25						
Mercury	0.298	0.0100	mg/kg	0.31600		94	80-120			

Batch B25H128 - SW 3051

Blank (B25H128-BLK1)		Prepared: 14-Oct-25 Analyzed: 07-Jan-26								
Arsenic	ND	0.0500	mg/kg							
Cadmium	ND	0.0500	"							
Copper	0.123	0.0500	"							B
Lead	ND	0.0500	"							
Selenium	ND	0.0500	"							
Silver	ND	0.0500	"							
Zinc	ND	0.500	"							

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H128 - SW 3051

LCS (B25H128-BS1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.2	0.0500	mg/kg	9.9950		102	80-120			
Cadmium	9.56	0.0500	"	9.9950		96	80-120			
Copper	10.4	0.0500	"	9.9900		104	80-120			B
Lead	9.77	0.0500	"	9.9900		98	80-120			
Selenium	9.49	0.0500	"	9.9950		95	80-120			
Silver	9.56	0.0500	"	9.9900		96	80-120			
Zinc	203	0.500	"	199.42		102	80-120			

LCS Dup (B25H128-BSD1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.1	0.0500	mg/kg	9.9950		101	80-120	0.8	20	
Cadmium	9.77	0.0500	"	9.9950		98	80-120	2	20	
Copper	10.3	0.0500	"	9.9900		103	80-120	0.9	20	B
Lead	9.68	0.0500	"	9.9900		97	80-120	0.9	20	
Selenium	9.47	0.0500	"	9.9950		95	80-120	0.2	20	
Silver	9.70	0.0500	"	9.9900		97	80-120	1	20	
Zinc	204	0.500	"	199.42		102	80-120	0.2	20	

MRL Check (B25H128-MRL1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	0.0472	0.0500	mg/kg	0.050000		94	70-130			J
Cadmium	0.0505	0.0500	"	0.050000		101	70-130			
Copper	0.152	0.0500	"	0.050000		304*	70-130			Z-REP, B
Lead	0.0471	0.0500	"	0.050000		94	70-130			J
Selenium	0.0480	0.0500	"	0.050000		96	70-130			J
Silver	0.0422	0.0500	"	0.050000		84	70-130			
Zinc	1.02	0.500	"	0.99716		102	70-130			

Matrix Spike (B25H128-MS1)

Source: 2508100-14

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.2	0.0501	mg/kg	10.017	0.0408	101	75-125			
Cadmium	9.83	0.0501	"	10.017	0.0532	98	75-125			
Copper	10.5	0.0501	"	10.012	0.775	97	75-125			B
Lead	10.2	0.0501	"	10.012	ND	102	75-125			
Selenium	11.2	0.0501	"	10.017	1.13	100	75-125			
Silver	9.43	0.0501	"	10.012	ND	94	75-125			
Zinc	221	0.501	"	199.86	19.9	101	75-125			

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H128 - SW 3051

Matrix Spike Dup (B25H128-MSD1)		Source: 2508100-14		Prepared: 14-Oct-25		Analyzed: 07-Jan-26				
Arsenic	10.5	0.0511	mg/kg	10.216	0.0408	102	75-125	3	20	
Cadmium	9.62	0.0511	"	10.216	0.0532	94	75-125	2	20	
Copper	10.7	0.0511	"	10.211	0.775	97	75-125	2	20	B
Lead	10.1	0.0511	"	10.211	ND	99	75-125	0.8	20	
Selenium	11.3	0.0511	"	10.216	1.13	100	75-125	1	20	
Silver	9.26	0.0511	"	10.211	ND	91	75-125	2	20	
Zinc	236	0.511	"	203.82	19.9	106	75-125	6	20	

Batch B25I040 - SW 3051

Blank (B25I040-BLK1)				Prepared: 14-Oct-25		Analyzed: 14-Jan-26				
Arsenic	ND	0.0500	mg/kg							
Cadmium	ND	0.0500	"							
Copper	ND	0.0500	"							
Lead	ND	0.0500	"							
Selenium	ND	0.0500	"							
Silver	ND	0.0500	"							
Zinc	ND	0.500	"							

LCS (B25I040-BS1)				Prepared: 14-Oct-25		Analyzed: 14-Jan-26				
Arsenic	10.1	0.0500	mg/kg	9.9950		101	80-120			
Cadmium	10.0	0.0500	"	9.9950		100	80-120			
Copper	10.1	0.0500	"	9.9900		101	80-120			
Lead	10.1	0.0500	"	9.9900		101	80-120			
Selenium	9.52	0.0500	"	9.9950		95	80-120			
Silver	10.0	0.0500	"	9.9900		100	80-120			
Zinc	201	0.500	"	199.42		101	80-120			

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25I040 - SW 3051

LCS Dup (B25I040-BSD1)

Prepared: 14-Oct-25 Analyzed: 14-Jan-26

Arsenic	9.90	0.0500	mg/kg	9.9950		99	80-120	2	20	
Cadmium	9.78	0.0500	"	9.9950		98	80-120	2	20	
Copper	9.94	0.0500	"	9.9900		99	80-120	2	20	
Lead	9.91	0.0500	"	9.9900		99	80-120	2	20	
Selenium	9.45	0.0500	"	9.9950		95	80-120	0.6	20	
Silver	10.3	0.0500	"	9.9900		103	80-120	3	20	
Zinc	205	0.500	"	199.42		103	80-120	2	20	

MRL Check (B25I040-MRL1)

Prepared: 14-Oct-25 Analyzed: 14-Jan-26

Arsenic	0.0484	0.0500	mg/kg	0.050000		97	70-130			J
Cadmium	0.0489	0.0500	"	0.050000		98	70-130			J
Copper	0.0503	0.0500	"	0.050000		101	70-130			
Lead	0.0475	0.0500	"	0.050000		95	70-130			J
Selenium	0.0472	0.0500	"	0.050000		94	70-130			J
Silver	0.0419	0.0500	"	0.050000		84	70-130			
Zinc	0.954	0.500	"	0.99716		96	70-130			

Matrix Spike (B25I040-MS1)

Source: 2508101-15

Prepared: 14-Oct-25 Analyzed: 14-Jan-26

Arsenic	10.3	0.0537	mg/kg	10.727	0.165	94	75-125			
Cadmium	10.3	0.0537	"	10.727	0.206	94	75-125			
Copper	10.7	0.0537	"	10.721	0.734	93	75-125			
Lead	10.4	0.0537	"	10.721	ND	97	75-125			
Selenium	11.7	0.0537	"	10.727	1.03	99	75-125			
Silver	9.97	0.0537	"	10.721	ND	93	75-125			
Zinc	230	0.537	"	214.02	23.2	97	75-125			

Matrix Spike Dup (B25I040-MSD1)

Source: 2508101-15

Prepared: 14-Oct-25 Analyzed: 14-Jan-26

Arsenic	10.4	0.0511	mg/kg	10.207	0.165	100	75-125	1	20	
Cadmium	10.4	0.0511	"	10.207	0.206	100	75-125	2	20	
Copper	11.5	0.0511	"	10.202	0.734	105	75-125	7	20	
Lead	10.4	0.0511	"	10.202	ND	102	75-125	0.2	20	
Selenium	11.4	0.0511	"	10.207	1.03	102	75-125	3	20	
Silver	10.3	0.0511	"	10.202	ND	101	75-125	3	20	
Zinc	228	0.511	"	203.66	23.2	100	75-125	1	20	

Alaska State Environmental Health Laboratory

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



Steve R Crupi, Program Coordinator 2

Classical Chemistry Parameters - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508101

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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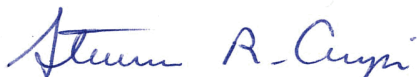
Batch B25H124 - % Solids

Blank (B25H124-BLK1)

Prepared: 13-Jan-26 Analyzed: 16-Jan-26

% Solids	ND	0.100	% by weight
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Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Client: Constantine		Tissue	Sample Stats		Prep	Jars								Comments				WO								
Project: Palmer Project at Haines		Submitted As	Tissue Processed	Individuals	Composite-all as one (small items)	Length	Weight	Sex	Otoliths	Standard	Organic	Alys (Organic Prep Required)	Biopsy Punch/Plug (P)	Composite (C)	Extra	Fatty acid	Gamma	Metals	Nutrients	PFAS (Organic Prep Required)	Reference	6020 Ag, As, Cd, Cu, Pb, Se, Zn	7473 Hg	%solid (if sufficient volume)	Notes	
Sample	Date / Time																									
LSAR 1	6/11/25 1200	W	W	X						X								X	X			X	X			-01
LSAR 2	6/11/25 1200	W	W	X						X								X	X			X	X			-02
LSAR 3	6/11/25 1200	W	W	X						X								X	X			X	X			-03
LSAR 4	6/11/25 1200	W	W	X						X								X	X			X	X			-04
PLAT 1	6/11/25 1430	W	W	X						X								X	X			X	X			-05
PLAT 2	6/11/25 1430	W	W	X						X								X	X			X	X			-06
PLAT 3	6/11/25 1430	W	W	X						X								X	X			X	X			-07
PLAT 4	6/11/25 1430	W	W	X						X								X	X			X	X			-08
PLAT 5	6/11/25 1430	W	W	X						X								X	X			X	X			-09
PLAT 6	6/11/25 1430	W	W	X						X								X	X			X	X			-10
PLAT 7	6/11/25 1430	W	W	X						X								X	X			X	X			-11
PLAT 8	6/11/25 1430	W	W	X						X								X	X			X	X			-12
PLAT 9	6/11/25 1430	W	W	X						X								X	X			X	X			-13
PLAT 10	6/11/25 1430	W	W	X						X								X	X			X	X			-14
MGC 1	6/10/25 1700	W	W	X						X								X	X			X	X			-15
																										-16
																										-17
																										-18
																										-19
																										-20

NOTES: W=Whole Body, F=Fillet, R=Roast, G=Gonads, K=Kidney, L=Liver, P=Plugs, C=Composite



State of Alaska
Department of Environmental Conservation
Fish Tissue Monitoring Program
5251 Dr MLK Jr. Ave
Anchorage, AK 99507

Collected (Sampled) By:	Dylan Krull
Submitted by:	Dylan Krull
Submitted Date/Time:	08/18/2025/1200
Received by:	Hans Miller
Received Date/Time:	8/19/25 9:40

GOLDSTREAK



0273901335400001

Air Waybill No :

027 – 39013354

Destination :	Total Pieces :	Total Weight(lbs)
ANC	1	11.0

SCC : SOA,FRO,NON

Route : JNU – ANC | AS0084 | 18AUG

GOLDSTREAK

Alaska[®]
AIR CARGO

2-5399



ADEC EHL Sample Receipt Checklist

(form SC-11, rev 3/14/2025)
Environmental Health Laboratory
5251 Dr. MLK Jr. Ave., Anchorage, AK 99507
(907) 375-8200



WO #: 2508101 # of Samples: 15
Client: Constantine Sample Matrix: Fish
Palmer Project @ Haines

COC Seals:

☒ On Shipping Container Intact? Y/N
☐ On Sample Packaging Intact? Y/N
☐ None

Received via:

☐ USPS
☐ UPS
☐ FedEx

☐ Delivered by Client/Client Courier
☒ Courier Shipper: AK Air
☐ Other

Shipment Tracking # 027-39013354

Sample Temperature @ Receipt: 5.6 °C

Thermometer ID (circle one): A25C104, calibration due 1/06/2027

Other: _____

Shipping Container Type:

☐ Box
☒ Cooler
☐ Envelope
☐ Hand Carry
☐ Styro-Box
☐ Other _____

Sample Packaging Type:

☒ Plastic/Ziploc Bag
☐ Plastic/Glass Vial/Jar
☐ Whirl Pak Bag
☐ Vacuum Packaging
☐ Commercial Packaging
☐ Blood Tubes
☐ Other _____

Refrigerant:

☐ Dry Ice
☒ Gel/Ice Pack
☐ Water Ice
☐ Other _____
☐ None
Notes: _____

Sample(s) and Sample Containers:

Intact? Y ☒ N ☐
Correct Type? Y ☒ N ☐
IDs/Times/Dates Match Form? Y ☒ N ☐

Properly Preserved? Y ☒ N ☐
Meets Temp Requirements? Y ☒ N ☐
Adequate Amount for Tests? Y ☒ N ☐

Sample Submission/Tracking Forms:

Sample Submission Form Complete? Y ☒ N ☐
Sample Tracking Form Required? N ☒ Y ☐
Client Contacted Regarding Incomplete Data? N ☒ Y ☐

If yes, completed? (circle) Yes
Provide details below in "Comments" section.

Comments: _____



ANALYTICAL REPORT

Alaska State Environmental Health Laboratory

5251 Dr. Martin Luther King Jr. Avenue

Anchorage, AK 99507

www.dec.alaska.gov/eh/lab

Work Order Number: 2508100

Project Name: Palmer Project at Haines

For:

Constantine

PO Box 315

Haines, AK 99827

Attn: Kris Benusa

A handwritten signature in blue ink, reading "Steve R. Crupi".

Steve R Crupi

Program Coordinator 2

steve.crupi@alaska.gov



Report Date: 01/29/2026

The results in this report apply to the samples analyzed in accordance with the sample submission form. This analytical report must be reproduced in its entirety. This report has been electronically signed and authorized by the signatory.

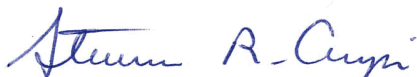
Sample Summary

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/2026 14:56

Lab Sample ID	Client Sample ID	Cooler	Temp C	Collected	Received
2508100-01	LGC 1	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-02	LGC 2	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-03	LGC 3	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-04	LGC 4	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-05	LGC 5	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-06	LGC 6	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-07	LGC 7	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-08	LGC 8	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-09	LGC 9	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-10	LGC 10	Default Cooler	5.6	6/12/25 9:00 am	8/19/25 9:40 am
2508100-11	USAR 1	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-12	USAR 2	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-13	USAR 3	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-14	USAR 4	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-15	USAR 5	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-16	USAR 6	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-17	USAR 7	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-18	USAR 8	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-19	USAR 9	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am
2508100-20	USAR 10	Default Cooler	5.6	6/11/25 10:00 am	8/19/25 9:40 am

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Methods

All samples were analyzed and conform with the following methods unless otherwise specified in the Case Narrative:

*** DEFAULT SPECIFIC METHOD ***

Fish prep

SM 2540 G

SW 3051A/6020A

SW 7473

Case Narrative

B

Copper is present in the method blank B25H128-BLK1 (0.123 mg/Kg, RL = 0.05 mg/Kg) as well as in the associated samples 13 - 20, ranging from 0.412 - 0.873 mg/Kg in the samples. Copper detections in the method blank and samples are flagged with a 'B'. Email conversations with Dylan Krull January 8-9, 2026 acknowledged the comparability of the sample concentrations to prior data, so the decision was made to report the data 'as is'.

HT-REC

The samples were received outside of the holding time for the percent solids test.

J

Concentrations greater than or equal to the detection limit, but less than the reporting limit are flagged with a 'J' and considered an estimated concentration.

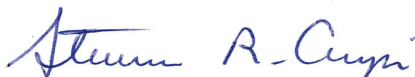
Z-REP

The copper recovery in the method reporting limit standard B25H127-MRL1 is above the QC limit (130%). Sample results associated with this standard may be biased high.

Z-REPa

The copper recovery in the method reporting limit standard B25H128-MRL1 is above the QC limit (130%). Copper contamination in the lab method blank associated with this standard may explain the high recovery. Copper results in the associated samples may be biased high.

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Notes and Definitions

Z-REPa	B25H128-MRL1 Cu %R>130. Sample results may be biased high.
Z-REP	B25H127-MRL1 Cu %R>130. Sample results may be biased high.
J	Detected but below the Reporting Limit: therefore, result is an estimated concentration
HT-REC	The sample arrived at the lab outside of the holding time for this test.
B	Analyte is found in the associated blank as well as in the sample.

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

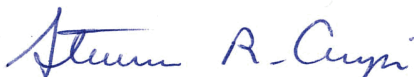
Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 1
Lab Sample ID: 2508100-01
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0385	0.0511	0.0113	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	J
Cadmium	0.104	0.0511	0.0165	mg/kg	"	"	"	"	"	
Copper	0.659	0.0511	0.0175	mg/kg	"	"	"	"	"	
Lead	ND	0.0511	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.0141	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.36	0.0511	0.00725	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0511	0.0345	mg/kg	"	"	"	"	"	
Zinc	27.3	0.511	0.148	mg/kg	"	"	"	"	"	
% Solids	22.5	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 2
Lab Sample ID: 2508100-02
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.104	0.0512	0.0114	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.215	0.0512	0.0166	mg/kg	"	"	"	"	"	
Copper	0.789	0.0512	0.0175	mg/kg	"	"	"	"	"	
Lead	0.0236	0.0512	0.0222	mg/kg	"	"	"	"	"	J
Mercury	0.0202	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.67	0.0512	0.00727	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0512	0.0346	mg/kg	"	"	"	"	"	
Zinc	57.7	0.512	0.148	mg/kg	"	"	"	"	"	
% Solids	25.0	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 3
Lab Sample ID: 2508100-03
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0475	0.0545	0.0121	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	J
Cadmium	0.0661	0.0545	0.0177	mg/kg	"	"	"	"	"	
Copper	0.746	0.0545	0.0186	mg/kg	"	"	"	"	"	
Lead	ND	0.0545	0.0236	mg/kg	"	"	"	"	"	
Mercury	0.0161	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.83	0.0545	0.00774	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0545	0.0368	mg/kg	"	"	"	"	"	
Zinc	25.9	0.545	0.158	mg/kg	"	"	"	"	"	
% Solids	24.3	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 4
Lab Sample ID: 2508100-04
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0774	0.0513	0.0114	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.0701	0.0513	0.0166	mg/kg	"	"	"	"	"	
Copper	0.920	0.0513	0.0175	mg/kg	"	"	"	"	"	
Lead	ND	0.0513	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.0178	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.47	0.0513	0.00728	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0513	0.0346	mg/kg	"	"	"	"	"	
Zinc	37.9	0.513	0.149	mg/kg	"	"	"	"	"	
% Solids	25.0	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 5
Lab Sample ID: 2508100-05
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0550	0.0506	0.0112	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.165	0.0506	0.0164	mg/kg	"	"	"	"	"	
Copper	1.07	0.0506	0.0173	mg/kg	"	"	"	"	"	
Lead	ND	0.0506	0.0220	mg/kg	"	"	"	"	"	
Mercury	0.0148	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	2.11	0.0506	0.00719	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0506	0.0342	mg/kg	"	"	"	"	"	
Zinc	40.8	0.506	0.147	mg/kg	"	"	"	"	"	
% Solids	24.4	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 6
Lab Sample ID: 2508100-06
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0422	0.0526	0.0117	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	J
Cadmium	0.0595	0.0526	0.0170	mg/kg	"	"	"	"	"	
Copper	0.824	0.0526	0.0180	mg/kg	"	"	"	"	"	
Lead	ND	0.0526	0.0228	mg/kg	"	"	"	"	"	
Mercury	0.0130	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.13	0.0526	0.00747	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0526	0.0356	mg/kg	"	"	"	"	"	
Zinc	30.1	0.526	0.153	mg/kg	"	"	"	"	"	
% Solids	23.0	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 7
Lab Sample ID: 2508100-07
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0412	0.0506	0.0112	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	J
Cadmium	0.0948	0.0506	0.0164	mg/kg	"	"	"	"	"	
Copper	1.14	0.0506	0.0173	mg/kg	"	"	"	"	"	
Lead	0.0251	0.0506	0.0219	mg/kg	"	"	"	"	"	J
Mercury	0.00910	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	1.24	0.0506	0.00718	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0506	0.0342	mg/kg	"	"	"	"	"	
Zinc	25.1	0.506	0.147	mg/kg	"	"	"	"	"	
% Solids	21.4	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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

Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 8
Lab Sample ID: 2508100-08
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.166	0.0541	0.0120	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.266	0.0541	0.0175	mg/kg	"	"	"	"	"	
Copper	1.38	0.0541	0.0185	mg/kg	"	"	"	"	"	
Lead	0.109	0.0541	0.0235	mg/kg	"	"	"	"	"	
Mercury	0.0182	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.43	0.0541	0.00768	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0541	0.0365	mg/kg	"	"	"	"	"	
Zinc	59.9	0.541	0.157	mg/kg	"	"	"	"	"	
% Solids	23.8	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 9
Lab Sample ID: 2508100-09
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.122	0.0504	0.0112	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.139	0.0504	0.0163	mg/kg	"	"	"	"	"	
Copper	0.866	0.0504	0.0172	mg/kg	"	"	"	"	"	
Lead	0.0248	0.0504	0.0219	mg/kg	"	"	"	"	"	J
Mercury	0.0118	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	2.17	0.0504	0.00716	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0504	0.0341	mg/kg	"	"	"	"	"	
Zinc	41.5	0.504	0.146	mg/kg	"	"	"	"	"	
% Solids	22.9	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: LGC 10
Lab Sample ID: 2508100-10
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0493	0.0548	0.0122	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	J
Cadmium	0.0710	0.0548	0.0177	mg/kg	"	"	"	"	"	
Copper	0.786	0.0548	0.0187	mg/kg	"	"	"	"	"	
Lead	ND	0.0548	0.0238	mg/kg	"	"	"	"	"	
Mercury	0.0102	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.28	0.0548	0.00777	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0548	0.0370	mg/kg	"	"	"	"	"	
Zinc	35.2	0.548	0.159	mg/kg	"	"	"	"	"	
% Solids	22.2	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 1
Lab Sample ID: 2508100-11
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0591	0.0512	0.0114	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.0987	0.0512	0.0166	mg/kg	"	"	"	"	"	
Copper	0.855	0.0512	0.0175	mg/kg	"	"	"	"	"	
Lead	ND	0.0512	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.0107	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	1.01	0.0512	0.00728	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0512	0.0346	mg/kg	"	"	"	"	"	
Zinc	30.0	0.512	0.149	mg/kg	"	"	"	"	"	
% Solids	21.7	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 2
Lab Sample ID: 2508100-12
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0545	0.0537	0.0119	mg/kg	1	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Cadmium	0.264	0.0537	0.0174	mg/kg	"	"	"	"	"	
Copper	1.40	0.0537	0.0184	mg/kg	"	"	"	"	"	
Lead	ND	0.0537	0.0233	mg/kg	"	"	"	"	"	
Mercury	0.00680	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	1.93	0.0537	0.00763	mg/kg	"	B25H127	10-Oct-25	02-Jan-26	SW 3051A/6020A	
Silver	ND	0.0537	0.0363	mg/kg	"	"	"	"	"	
Zinc	25.4	0.537	0.156	mg/kg	"	"	"	"	"	
% Solids	21.9	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 3
Lab Sample ID: 2508100-13
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0359	0.0502	0.0111	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0588	0.0502	0.0163	mg/kg	"	"	"	"	"	
Copper	0.873	0.0502	0.0172	mg/kg	"	"	"	"	"	B
Lead	ND	0.0502	0.0218	mg/kg	"	"	"	"	"	
Mercury	0.00900	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	0.860	0.0502	0.00713	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0502	0.0339	mg/kg	"	"	"	"	"	
Zinc	28.0	0.502	0.146	mg/kg	"	"	"	"	"	
% Solids	21.4	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 4
Lab Sample ID: 2508100-14
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0408	0.0512	0.0114	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0532	0.0512	0.0166	mg/kg	"	"	"	"	"	
Copper	0.775	0.0512	0.0175	mg/kg	"	"	"	"	"	B
Lead	ND	0.0512	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.00770	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	1.13	0.0512	0.00727	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0512	0.0346	mg/kg	"	"	"	"	"	
Zinc	19.9	0.512	0.148	mg/kg	"	"	"	"	"	
% Solids	20.8	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 5
Lab Sample ID: 2508100-15
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0549	0.0534	0.0119	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Cadmium	0.0285	0.0534	0.0173	mg/kg	"	"	"	"	"	J
Copper	0.497	0.0534	0.0183	mg/kg	"	"	"	"	"	B
Lead	ND	0.0534	0.0232	mg/kg	"	"	"	"	"	
Mercury	0.00550	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	1.57	0.0534	0.00758	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0534	0.0361	mg/kg	"	"	"	"	"	
Zinc	26.3	0.534	0.155	mg/kg	"	"	"	"	"	
% Solids	20.1	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 6
Lab Sample ID: 2508100-16
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0207	0.0540	0.0120	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0471	0.0540	0.0175	mg/kg	"	"	"	"	"	J
Copper	0.572	0.0540	0.0185	mg/kg	"	"	"	"	"	B
Lead	ND	0.0540	0.0234	mg/kg	"	"	"	"	"	
Mercury	0.00850	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	2.07	0.0540	0.00767	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0540	0.0365	mg/kg	"	"	"	"	"	
Zinc	29.5	0.540	0.157	mg/kg	"	"	"	"	"	
% Solids	18.5	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 7
Lab Sample ID: 2508100-17
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0438	0.0537	0.0119	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.104	0.0537	0.0174	mg/kg	"	"	"	"	"	
Copper	0.791	0.0537	0.0184	mg/kg	"	"	"	"	"	B
Lead	ND	0.0537	0.0233	mg/kg	"	"	"	"	"	
Mercury	0.00740	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	0.831	0.0537	0.00762	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0537	0.0363	mg/kg	"	"	"	"	"	
Zinc	30.2	0.537	0.156	mg/kg	"	"	"	"	"	
% Solids	18.9	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

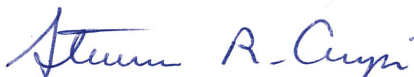
Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 8
Lab Sample ID: 2508100-18
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0340	0.0541	0.0120	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0556	0.0541	0.0175	mg/kg	"	"	"	"	"	
Copper	0.580	0.0541	0.0185	mg/kg	"	"	"	"	"	B
Lead	ND	0.0541	0.0235	mg/kg	"	"	"	"	"	
Mercury	0.00850	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	1.15	0.0541	0.00768	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0541	0.0366	mg/kg	"	"	"	"	"	
Zinc	18.6	0.541	0.157	mg/kg	"	"	"	"	"	
% Solids	18.7	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 9
Lab Sample ID: 2508100-19
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0475	0.0511	0.0113	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0328	0.0511	0.0166	mg/kg	"	"	"	"	"	J
Copper	0.442	0.0511	0.0175	mg/kg	"	"	"	"	"	B
Lead	ND	0.0511	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.00790	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	J
Selenium	0.691	0.0511	0.00726	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0511	0.0345	mg/kg	"	"	"	"	"	
Zinc	27.2	0.511	0.148	mg/kg	"	"	"	"	"	
% Solids	18.8	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Analytical Data

Client: Constantine
Project: Palmer Project at Haines

Work Order: 2508100
Report Date: 01/29/26 14:56

Client Sample ID: USAR 10
Lab Sample ID: 2508100-20
Sampled By: Dylan Krull

Analyte	Result	Reporting Limit	Detection Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.0403	0.0512	0.0114	mg/kg	1	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	J
Cadmium	0.0936	0.0512	0.0166	mg/kg	"	"	"	"	"	
Copper	0.728	0.0512	0.0175	mg/kg	"	"	"	"	"	B
Lead	ND	0.0512	0.0222	mg/kg	"	"	"	"	"	
Mercury	0.0130	0.0100	0.00480	mg/kg	"	B25H125	12-Sep-25	16-Sep-25	SW 7473	
Selenium	0.985	0.0512	0.00727	mg/kg	"	B25H128	14-Oct-25	07-Jan-26	SW 3051A/6020A	
Silver	ND	0.0512	0.0346	mg/kg	"	"	"	"	"	
Zinc	31.1	0.512	0.149	mg/kg	"	"	"	"	"	
% Solids	18.7	0.100		% by weight	1	B25H123	13-Jan-26	14-Jan-26	SM 2540 G	HT-RE C

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B25H125 - EPA 7473										
Blank (B25H125-BLK1)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK2)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK3)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK4)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK5)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK6)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK7)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Blank (B25H125-BLK8)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	ND	0.0100	mg/kg							
Duplicate (B25H125-DUP1)				Source: 2508100-01		Prepared: 12-Sep-25 Analyzed: 16-Sep-25				
Mercury	0.0137	0.0100	mg/kg		0.0141			3	20	
Duplicate (B25H125-DUP2)				Source: 2508100-20		Prepared: 12-Sep-25 Analyzed: 16-Sep-25				
Mercury	0.0119	0.0100	mg/kg		0.0130			9	20	

Alaska State Environmental Health Laboratory



Steve R Crupi, Program Coordinator 2

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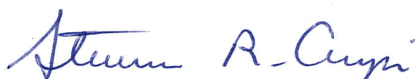
Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B25H125 - EPA 7473										
MRL Check (B25H125-MRL1)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.0111	0.0100	mg/kg	0.010069		110	70-130			
Matrix Spike (B25H125-MS1)				Source: 2508100-01 Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.254	0.0100	mg/kg	0.24746	0.0141	97	71-124			
Matrix Spike Dup (B25H125-MSD1)				Source: 2508100-01 Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.257	0.0100	mg/kg	0.24832	0.0141	98	71-124	1	20	
Reference (B25H125-SRM1)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.304	0.0100	mg/kg	0.31600		96	90-110			
Reference (B25H125-SRM2)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.317	0.0100	mg/kg	0.31600		100	90-110			
Reference (B25H125-SRM3)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.308	0.0100	mg/kg	0.31600		98	80-120			
Reference (B25H125-SRM4)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.306	0.0100	mg/kg	0.31600		97	80-120			
Reference (B25H125-SRM5)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.306	0.0100	mg/kg	0.31600		97	80-120			
Reference (B25H125-SRM6)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.301	0.0100	mg/kg	0.31600		95	80-120			
Reference (B25H125-SRM7)				Prepared: 12-Sep-25 Analyzed: 16-Sep-25						
Mercury	0.306	0.0100	mg/kg	0.31600		97	80-120			

Alaska State Environmental Health Laboratory

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H125 - EPA 7473

Reference (B25H125-SRM8)

Prepared: 12-Sep-25 Analyzed: 16-Sep-25

Mercury	0.305	0.0100	mg/kg	0.31600	97	80-120
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Batch B25H127 - SW 3051

Blank (B25H127-BLK1)

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	ND	0.0500	mg/kg
Cadmium	ND	0.0500	"
Copper	ND	0.0500	"
Lead	ND	0.0500	"
Selenium	ND	0.0500	"
Silver	ND	0.0500	"
Zinc	ND	0.500	"

LCS (B25H127-BS1)

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	9.93	0.0500	mg/kg	9.9950	99	80-120
Cadmium	10.2	0.0500	"	9.9950	102	80-120
Copper	10.3	0.0500	"	9.9900	103	80-120
Lead	10.0	0.0500	"	9.9900	100	80-120
Selenium	9.70	0.0500	"	9.9950	97	80-120
Silver	10.3	0.0500	"	9.9900	103	80-120
Zinc	209	0.500	"	199.42	105	80-120

LCS Dup (B25H127-BSD1)

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	9.92	0.0500	mg/kg	9.9950	99	80-120	0.1	20
Cadmium	10.1	0.0500	"	9.9950	101	80-120	0.1	20
Copper	10.1	0.0500	"	9.9900	101	80-120	2	20
Lead	10.4	0.0500	"	9.9900	104	80-120	4	20
Selenium	9.90	0.0500	"	9.9950	99	80-120	2	20
Silver	10.6	0.0500	"	9.9900	106	80-120	4	20
Zinc	203	0.500	"	199.42	102	80-120	3	20

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H127 - SW 3051

MRL Check (B25H127-MRL1)

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	0.0511	0.0500	mg/kg	0.050000		102	70-130			
Cadmium	0.0510	0.0500	"	0.050000		102	70-130			
Copper	0.0658	0.0500	"	0.050000		132*	70-130			Z-REP
Lead	0.0497	0.0500	"	0.050000		99	70-130			J
Selenium	0.0497	0.0500	"	0.050000		99	70-130			J
Silver	0.0460	0.0500	"	0.050000		92	70-130			
Zinc	1.07	0.500	"	0.99716		107	70-130			

Matrix Spike (B25H127-MS1)

Source: 2508100-02

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	11.0	0.0528	mg/kg	10.563	0.104	103	75-125			
Cadmium	11.0	0.0528	"	10.563	0.215	102	75-125			
Copper	11.4	0.0528	"	10.558	0.789	101	75-125			
Lead	10.5	0.0528	"	10.558	0.0236	99	75-125			
Selenium	12.6	0.0528	"	10.563	1.67	104	75-125			
Silver	10.3	0.0528	"	10.558	ND	97	75-125			
Zinc	253	0.528	"	210.76	57.7	93	75-125			

Matrix Spike Dup (B25H127-MSD1)

Source: 2508100-02

Prepared: 10-Oct-25 Analyzed: 02-Jan-26

Arsenic	11.0	0.0528	mg/kg	10.552	0.104	104	75-125	0.02	20	
Cadmium	10.7	0.0528	"	10.552	0.215	99	75-125	3	20	
Copper	11.5	0.0528	"	10.547	0.789	102	75-125	1	20	
Lead	10.7	0.0528	"	10.547	0.0236	101	75-125	1	20	
Selenium	12.6	0.0528	"	10.552	1.67	103	75-125	0.4	20	
Silver	10.2	0.0528	"	10.547	ND	96	75-125	0.8	20	
Zinc	243	0.528	"	210.54	57.7	88	75-125	4	20	

Batch B25H128 - SW 3051

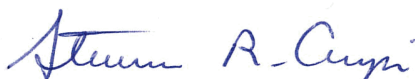
Blank (B25H128-BLK1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	ND	0.0500	mg/kg							
Cadmium	ND	0.0500	"							
Copper	0.123	0.0500	"							B
Lead	ND	0.0500	"							
Selenium	ND	0.0500	"							
Silver	ND	0.0500	"							
Zinc	ND	0.500	"							

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Metals - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H128 - SW 3051

LCS (B25H128-BS1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.2	0.0500	mg/kg	9.9950		102	80-120			
Cadmium	9.56	0.0500	"	9.9950		96	80-120			
Copper	10.4	0.0500	"	9.9900		104	80-120			B
Lead	9.77	0.0500	"	9.9900		98	80-120			
Selenium	9.49	0.0500	"	9.9950		95	80-120			
Silver	9.56	0.0500	"	9.9900		96	80-120			
Zinc	203	0.500	"	199.42		102	80-120			

LCS Dup (B25H128-BSD1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.1	0.0500	mg/kg	9.9950		101	80-120	0.8	20	
Cadmium	9.77	0.0500	"	9.9950		98	80-120	2	20	
Copper	10.3	0.0500	"	9.9900		103	80-120	0.9	20	B
Lead	9.68	0.0500	"	9.9900		97	80-120	0.9	20	
Selenium	9.47	0.0500	"	9.9950		95	80-120	0.2	20	
Silver	9.70	0.0500	"	9.9900		97	80-120	1	20	
Zinc	204	0.500	"	199.42		102	80-120	0.2	20	

MRL Check (B25H128-MRL1)

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	0.0472	0.0500	mg/kg	0.050000		94	70-130			J
Cadmium	0.0505	0.0500	"	0.050000		101	70-130			
Copper	0.152	0.0500	"	0.050000		304*	70-130			Z-REP a, B
Lead	0.0471	0.0500	"	0.050000		94	70-130			J
Selenium	0.0480	0.0500	"	0.050000		96	70-130			J
Silver	0.0422	0.0500	"	0.050000		84	70-130			
Zinc	1.02	0.500	"	0.99716		102	70-130			

Matrix Spike (B25H128-MS1)

Source: 2508100-14

Prepared: 14-Oct-25 Analyzed: 07-Jan-26

Arsenic	10.2	0.0501	mg/kg	10.017	0.0408	101	75-125			
Cadmium	9.83	0.0501	"	10.017	0.0532	98	75-125			
Copper	10.5	0.0501	"	10.012	0.775	97	75-125			B
Lead	10.2	0.0501	"	10.012	ND	102	75-125			
Selenium	11.2	0.0501	"	10.017	1.13	100	75-125			
Silver	9.43	0.0501	"	10.012	ND	94	75-125			
Zinc	221	0.501	"	199.86	19.9	101	75-125			

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Metals - Quality Control
Alaska State Environmental Health Laboratory

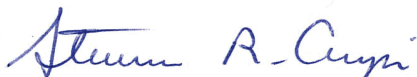
Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H128 - SW 3051

Matrix Spike Dup (B25H128-MSD1)		Source: 2508100-14		Prepared: 14-Oct-25		Analyzed: 07-Jan-26				
Arsenic	10.5	0.0511	mg/kg	10.216	0.0408	102	75-125	3	20	
Cadmium	9.62	0.0511	"	10.216	0.0532	94	75-125	2	20	
Copper	10.7	0.0511	"	10.211	0.775	97	75-125	2	20	B
Lead	10.1	0.0511	"	10.211	ND	99	75-125	0.8	20	
Selenium	11.3	0.0511	"	10.216	1.13	100	75-125	1	20	
Silver	9.26	0.0511	"	10.211	ND	91	75-125	2	20	
Zinc	236	0.511	"	203.82	19.9	106	75-125	6	20	

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Classical Chemistry Parameters - Quality Control
Alaska State Environmental Health Laboratory

Work Order: 2508100

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B25H123 - % Solids

Blank (B25H123-BLK1)

Prepared: 13-Jan-26 Analyzed: 14-Jan-26

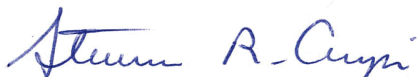
% Solids	ND	0.100	% by weight
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Blank (B25H123-BLK2)

Prepared: 13-Jan-26 Analyzed: 14-Jan-26

% Solids	ND	0.100	% by weight
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[illegible]

State of Alaska
Department of Environmental Conservation
Fish Tissue Monitoring Program
5251 Dr MLK Jr. Ave
Anchorage, AK 99507

Collected (Sampled) By:	Dylan Krull
Submitted by:	Dylan Krull
Submitted Date/Time:	08/18/2025

Submitted by: Dylan Knull
Submitted Date/Time: 08/18/2025/1200

Received by: Hans Miller
Received Date/Time: 8/19/25 9:40

GOLDSTREAK



0273901335400001

Air Waybill No :

027 – 39013354

Destination :	Total Pieces :	Total Weight(lbs)
ANC	1	11.0

SCC : SOA,FRO,NON

Route : JNU – ANC | AS0084 | 18AUG

GOLDSTREAK

Alaska[®]
AIR CARGO

2-5399



ADEC EHL Sample Receipt Checklist

(form SC-11, rev 3/14/2025)

Environmental Health Laboratory

5251 Dr. MLK Jr. Ave., Anchorage, AK 99507

(907) 375-8200



WO #:

2508100

of Samples:

10 20

Client:

Constantine

Sample Matrix:

Fish

Palmer Project @ Haines

COC Seals:

Received via:

☒	On Shipping Container	Intact? ☒ Y/N	☐	USPS	☐	Delivered by Client/Client Courier
☐	On Sample Packaging	Intact? Y/N	☐	UPS	☒	Courier Shipper: AK Air
☐	None		☐	FedEx	☐	Other

Shipment Tracking # 027-39013354

Sample Temperature @ Receipt: 5.6 °C

Thermometer ID (circle one): A25C104, calibration due 1/06/2027

Other:

Shipping Container Type:

Sample Packaging Type:

Refrigerant:

☐	Box	☒	Plastic/Ziploc Bag	☐	Dry Ice
☒	Cooler	☐	Plastic/Glass Vial/Jar	☒	Gel/Ice Pack
☐	Envelope	☐	Whirl Pak Bag	☐	Water Ice
☐	Hand Carry	☐	Vacuum Packaging	☐	Other
☐	Styro-Box	☐	Commercial Packaging	☐	None
☐	Other	☐	Blood Tubes	☐	Notes:
		☐	Other		

Sample(s) and Sample Containers:

Intact?	Y	☒	N	☐	Properly Preserved?	Y	☒	N	☐
Correct Type?	Y	☒	N	☐	Meets Temp Requirements?	Y	☒	N	☐
IDs/Times/Dates Match Form?	Y	☒	N	☐	Adequate Amount for Tests?	Y	☒	N	☐

Sample Submission/Tracking Forms:

Sample Submission Form Complete?	Y	☒	N	☐	If yes, completed? (circle) Yes Provide details below in "Comments" section.
Sample Tracking Form Required?	N	☒	Y	☐	
Client Contacted Regarding Incomplete Data?	N	☒	Y	☐	

Comments:

APPENDIX E: SEDIMENT DATA AND LABORATORY REPORT

Appendix E.1.–Lower Glacier Creek sediment compositions, 2016–2025.

Sample Date	Particle Size Data				% Total Solids	% Total Organic Carbon	Acid Volatile Sulfide (mg/kg)
	% Clay	% Silt	% Sand	% Course Material (> 2 mm)			
6/7/2016	4.00	29.17	66.83	0.00	78.6	0.274	ND
6/9/2017	1.98	26.67	71.07	0.29	82.3	<0.16	<0.20
6/9/2017	1.60	39.31	58.97	0.14	73.3	<0.17	<0.20
6/9/2017	0.65	18.35	81.01	0.00	73.9	0.20	<0.20
6/9/2017	1.33	27.75	70.31	0.62	77.8	0.25	<0.20
6/9/2017	0.38	3.16	95.57	0.62	76.3	<0.16	<0.20
5/30/2018	1.16	14.01	84.73	0.10	74.7	0.25	<0.20
5/30/2018	1.93	44.25	50.12	3.72	77.7	0.29	0.63
5/30/2018	2.04	41.78	56.19	0.00	78.0	<0.27	<0.20
5/30/2018	1.05	9.59	85.04	4.32	79.1	<0.20	<0.20
5/30/2018	1.44	16.08	81.88	4.32	78.6	<0.20	<0.20
6/6/2019	0.29	10.14	89.32	0.00	83.1	0.29	<0.20
6/7/2019	0.25	6.83	92.63	0.00	78.2	0.25	<0.20
6/8/2019	0.25	8.49	91.16	0.00	74.6	0.250	<0.20
6/9/2019	0.31	17.90	81.35	0.00	75.7	0.310	<0.20
6/10/2019	0.32	8.51	90.95	0.00	80.1	0.320	<0.20
6/3/2020	1.79	29.84	68.36	0.00	77.9	0.498	<0.20
6/3/2020	2.35	31.30	64.96	1.38	72.4	0.336	<0.20
6/3/2020	1.48	20.59	77.93	0.00	79.6	0.444	<0.20
6/3/2020	1.97	24.20	73.78	0.07	83.1	0.203	<0.20
6/3/2020	1.77	28.87	69.10	0.07	77.8	0.370	<0.20
6/16/2021	2.20	14.50	83.30	0.00	71.8	0.440	<5.0
6/16/2021	3.40	30.10	66.50	0.00	76.9	0.418	<5.0
6/16/2021	4.20	33.90	61.80	0.10	79.6	0.185	<5.0
6/16/2021	2.20	29.40	68.40	0.00	81.2	0.195	<5.0
6/16/2021	4.00	2.70	88.60	4.70	80.0	0.269	<5.0
6/13/2022	1.00	16.00	83.00	0.00	80.2	0.345	<5.0
6/13/2022	1.00	26.40	72.40	0.20	78.1	0.347	<5.0
6/13/2022	1.20	18.20	80.10	0.50	80.6	0.299	<5.0
6/13/2022	1.00	10.20	85.80	3.00	82.2	0.369	<5.0
6/13/2022	1.00	7.10	91.90	0.00	80.9	0.361	<5.0
6/7/2023	1.00	8.70	89.50	0.80	76.6	0.278	<5.0
6/7/2023	1.00	10.60	88.40	0.00	80.2	0.242	<5.0
6/7/2023	1.00	13.70	83.60	1.70	76.8	0.283	<5.0
6/7/2023	1.40	7.00	91.10	0.50	75.8	0.315	<5.0
6/7/2023	1.00	10.60	87.70	0.70	77.3	0.204	<5.0

-continued-

Appendix E.1.–Continued.

Sample Date	Particle Size Data				% Total Solids	% Total Organic Carbon	Acid Volatile Sulfide (mg/kg)
	% Clay	% Silt	% Sand	% Course Material (> 2 mm)			
6/3/2024	1.00	8.40	80.70	9.90	ND	ND	ND
6/3/2024	1.20	10.10	86.10	2.60	ND	ND	ND
6/3/2024	1.00	17.40	80.70	0.90	ND	ND	ND
6/3/2024	1.40	20.60	69.30	8.70	ND	ND	ND
6/3/2024	1.00	14.80	79.10	5.10	ND	ND	ND
6/12/2025	5.4	29.6	64.63	0.4	75.3	ND	ND
6/12/2025	5.1	23.6	71.3	0.0	69.0	ND	ND
6/12/2025	3.7	2.1	93.0	1.2	69.4	ND	ND
6/12/2025	3.7	5.3	90.4	0.6	72.2	ND	ND
6/12/2025	5.2	22.3	72.5	0.0	72.4	ND	ND

Appendix E.2.–Lower Glacier Creek sediment elements concentrations, 2016–2025.

Sample	Concentration (mg/kg dry weight)									
Date	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/7/2016	0.19	9,460	4.98	1.17	51.1	35,700	<0.020	9.06	1.69	193
6/9/2017	0.14	15,500	3.91	0.510	37.0	47,300	0.0120	7.90	1.22	133
6/9/2017	0.25	16,300	5.68	0.910	58.5	57,800	0.0194	20.60	1.35	202
6/9/2017	0.26	14,700	5.49	1.01	53.6	51,100	0.0204	8.49	1.67	186
6/9/2017	0.21	14,900	4.66	0.821	60.1	53,600	0.0144	20.10	1.39	173
6/9/2017	0.17	13,300	3.94	0.818	48.9	51,400	0.0135	7.03	1.54	186
5/30/2018	0.19	18,300	4.65	1.02	49.3	50,400	0.0125	9.84	1.44	185
5/30/2018	0.14	16,600	4.08	0.880	44.4	42,600	0.0079	5.88	1.07	150
5/30/2018	0.17	14,900	3.60	0.858	44.1	43,600	0.0119	6.58	1.31	160
5/30/2018	0.16	15,400	4.27	0.835	41.6	45,100	0.0142	8.11	1.12	168
5/30/2018	0.15	15,500	3.46	0.639	40.7	44,900	0.0092	7.53	1.00	141
6/6/2019	0.17	17,300	4.32	0.950	50.4	48,400	0.0172	10.90	1.28	189
6/6/2019	0.17	16,800	6.70	0.950	62.4	51,400	0.0131	6.23	1.43	173
6/6/2019	0.13	17,400	5.15	0.937	39.3	46,900	0.0174	7.50	1.18	179
6/6/2019	0.15	16,200	3.68	0.934	45.3	45,400	0.0156	5.23	1.06	166
6/6/2019	0.14	15,700	4.72	0.771	45.2	44,900	0.0111	4.99	1.03	146
6/3/2020	0.22	15,200	5.44	1.520	56.3	43,200	0.0125	7.14	2.41	213
6/3/2020	0.16	16,200	3.35	0.904	48.0	42,800	0.0109	6.08	1.08	166
6/3/2020	0.18	16,800	4.33	1.630	48.4	43,700	0.0164	8.49	1.58	184
6/3/2020	0.11	14,800	3.14	0.640	40.1	43,400	0.0103	5.98	0.8	152
6/3/2020	0.21	15,200	4.61	0.924	54.3	43,000	0.0097	7.57	1.52	150
6/16/2021	0.18	11,800	4.48	1.070	43.1	41,600	0.0161	7.41	1.58	166
6/16/2021	0.14	12,500	4.48	1.150	31.6	39,000	0.0100	4.26	1.56	160
6/16/2021	0.15	18,500	3.69	0.572	50.7	59,800	0.0192	14.20	0.75	186
6/16/2021	0.14	11,600	6.48	0.540	51.0	54,400	0.0158	15.10	0.92	142
6/16/2021	0.13	12,900	2.85	1.008	33.9	35,550	0.0140	5.54	0.91	142.5
6/13/2022	0.17	15,400	3.89	0.920	67.5	45,500	0.0164	6.90	1.60	156
6/13/2022	0.16	15,700	4.75	0.989	52.2	44,700	0.0109	6.21	1.82	168
6/13/2022	0.15	16,200	4.53	1.050	51.3	53,600	0.0196	8.57	1.68	178
6/13/2022	0.16	15,400	4.04	0.902	42.3	46,800	0.0095	21.70	1.49	161
6/13/2022	0.13	15,400	3.81	0.879	68.5	43,300	0.0098	4.98	1.29	140
6/7/2023	0.12	16,900	3.94	0.758	33.0	42,500	0.0355	5.19	1.24	159
6/7/2023	0.13	15,600	5.34	0.988	40.3	42,600	0.0140	6.26	1.15	189
6/7/2023	0.15	18,000	4.28	0.783	44.5	48,200	0.0120	16.30	1.08	173
6/7/2023	0.14	17,800	4.68	0.839	49.3	46,500	0.0130	6.45	1.10	171
6/7/2023	0.17	17,700	5.34	0.925	57.8	53,600	0.0233	11.80	1.35	196

Appendix E.2.–Continued.

Sample Date	Concentration (mg/kg dry weight)									
	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/3/2024	0.11	15,150	2.02	0.526	24.1	38,250	0.0132	3.35	0.68	150
6/3/2024	<0.10	15,700	1.93	0.401	38.2	41,700	<0.0050	2.86	0.65	108
6/3/2024	0.11	14,700	3.18	0.675	45.3	41,400	0.0118	7.14	0.71	158
6/3/2024	0.14	15,200	4.52	0.735	56.5	46,000	0.0152	6.97	1.05	169
6/3/2024	0.15	15,200	1.88	0.790	33.7	39,800	0.0094	3.38	0.94	142
6/12/2025	0.183	10,900	5.55	0.801	76.8	42,700	0.0053	7.28	1.77	174
6/12/2025	0.159	12,700	4.87	0.829	76.5	42,400	0.0133	5.48	1.60	167
6/12/2025	0.128	12,000	4.21	0.622	54.9	37,100	0.0106	5.42	<1.0	135
6/12/2025	0.155	11,300	4.93	0.97	51.2	37,300	0.0113	5.28	1.60	170
6/12/2025	0.156	14,400	4.97	0.846	59.6	42,000	0.0121	6.21	1.30	165

Appendix E.3.—Middle Glacier Creek sediment compositions, 2016–2025.

Sample Date	Particle Size Data				% Total Solids	% Total Organic Carbon	Acid Volatile Sulfide (mg/kg)
	% Clay	% Silt	% Sand	% Course Material (> 2 mm)			
6/8/2016	4.06	31.18	64.76	0.00	80.50	0.491	ND
6/9/2017	0.66	11.07	83.97	4.30	82.50	<0.16	<0.20
6/9/2017	0.59	16.12	80.79	2.51	80.30	<0.17	<0.20
6/9/2017	1.21	28.37	70.36	0.05	76.10	<0.19	0.30
6/9/2017	2.30	48.51	49.19	0.00	74.80	0.27	<0.20
6/9/2017	2.62	45.51	51.89	0.00	74.70	<0.19	<0.20
5/31/2018	1.62	33.75	63.45	1.19	83.80	<0.28	0.40
5/31/2018	1.65	26.48	71.45	0.41	80.10	<0.29	<0.20
5/31/2018	1.21	10.73	74.57	13.49	77.70	<0.25	<0.20
5/31/2018	1.56	25.93	71.89	0.62	75.00	<0.27	<0.20
5/31/2018	1.56	15.69	80.82	1.94	71.40	0.37	<0.20
6/6/2019	0.49	10.58	84.23	4.68	83.40	0.44	<0.20
6/6/2019	1.51	21.39	77.09	0.00	84.10	0.30	<0.20
6/6/2019	0.52	9.97	89.51	0.00	82.90	0.37	<0.20
6/6/2019	1.14	25.86	73.00	0.00	78.60	0.58	<0.20
6/6/2019	0.56	13.64	85.80	0.00	76.20	0.56	<0.20
6/2/2020	2.33	39.96	57.09	0.62	75.60	0.26	<0.20
6/2/2020	2.37	35.95	61.67	0.00	73.00	0.36	<0.20
6/2/2020	2.60	37.46	59.93	0.00	80.30	0.40	<0.20
6/2/2020	2.84	42.50	54.30	0.36	71.60	0.42	<0.20
6/2/2020	2.72	36.99	60.30	0.00	78.30	0.31	<0.20
6/15/2021	3.40	28.70	67.90	0.00	77.70	0.172	<5.0
6/15/2021	3.80	4.90	90.90	0.40	80.80	0.257	<5.0
6/15/2021	4.60	31.80	59.50	4.10	76.80	0.317	<5.0
6/15/2021	2.20	18.60	78.60	0.60	81.50	0.193	<5.0
6/15/2021	2.20	32.90	64.90	0.00	80.40	0.320	<5.0
6/14/2022	1.00	10.60	88.20	0.20	79.80	0.242	<5.0
6/14/2022	0.00	5.00	94.00	1.00	81.80	0.165	<5.0
6/14/2022	1.00	8.00	90.00	1.00	83.50	0.143	<5.0
6/14/2022	1.00	23.00	76.00	1.00	78.10	0.408	<5.0
6/14/2022	1.00	13.30	85.60	0.10	80.20	0.321	<5.0
6/6/2023	1.00	8.70	85.00	5.30	79.60	0.646	<5.0
6/6/2023	1.00	10.50	85.90	2.60	77.00	0.604	<5.0
6/6/2023	1.00	10.80	86.40	1.80	76.60	0.816	<5.0
6/6/2023	1.00	14.80	82.30	1.90	78.20	0.570	<5.0
6/6/2023	1.00	13.40	84.10	1.50	78.60	0.489	<5.0

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Appendix E.3.—Continued.

Sample Date	Particle Size Data				% Total Solids	% Total Organic Carbon	Acid Volatile Sulfide (mg/kg)
	% Clay	% Silt	% Sand	% Course Material (> 2 mm)			
6/3/2024	2.80	28.80	59.60	8.80	ND	ND	ND
6/3/2024	1.80	24.60	69.80	3.80	ND	ND	ND
6/3/2024	2.30	30.00	66.20	1.50	ND	ND	ND
6/3/2024	1.00	12.80	85.70	0.50	ND	ND	ND
6/3/2024	2.90	38.90	56.70	1.50	ND	ND	ND
6/10/2025	8.74	44.85	45.11	1.30	72.9	ND	ND
6/10/2025	5.13	21.43	67.27	6.17	78.3	ND	ND
6/10/2025	3.76	4.25	71.82	20.17	84.7	ND	ND
6/10/2025	6.63	26.52	66.71	0.14	75.0	ND	ND
6/10/2025	5.43	19.24	75.33	0.00	75.8	ND	ND

Appendix E.4.–Middle Glacier Creek sediment elements concentrations, 2016–2025.

Sample	Concentration (mg/kg dry weight)									
Date	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/8/2016	0.16	7,650	4.33	0.871	55.8	32,400	<0.0200	12.00	1.14	170
6/9/2017	0.14	15,700	3.68	0.758	48.1	49,400	0.0094	8.67	0.90	190
6/9/2017	0.15	13,800	4.76	0.902	45.5	53,400	0.0179	14.80	0.93	203
6/9/2017	0.33	14,700	4.88	1.110	75.6	54,500	0.0161	12.50	2.05	189
6/9/2017	0.18	16,000	4.47	1.140	55.7	47,500	0.0210	12.30	1.30	205
6/9/2017	0.21	15,600	4.73	1.070	62.1	50,800	0.0181	11.90	1.42	199
5/31/2018	0.18	18,000	4.17	0.564	47.4	49,000	0.0072	6.89	1.25	122
5/31/2018	0.22	16,900	3.95	1.030	49.6	45,400	0.0260	5.48	1.67	167
5/31/2018	0.18	20,200	2.80	0.675	49.1	49,200	0.0079	5.49	1.03	139
5/31/2018	0.15	18,900	2.48	0.645	45.6	42,500	0.0093	5.24	0.71	129
5/31/2018	0.17	16,900	3.74	1.020	52.8	43,000	0.0118	5.99	1.34	160
6/7/2019	0.19	14,800	3.20	1.380	41.6	43,000	0.0133	3.76	1.83	189
6/7/2019	0.19	16,600	4.97	1.070	53.5	53,600	0.0140	7.40	1.54	174
6/7/2019	0.21	16,800	3.74	1.330	54.2	49,800	0.0128	5.45	1.43	230
6/7/2019	0.53	16,700	4.19	2.220	47.6	47,500	0.0150	10.40	1.55	181
6/7/2019	0.27	17,000	6.14	1.670	54.6	47,000	0.0150	7.45	2.56	204
6/2/2020	0.14	14,900	3.10	0.646	48.2	41,000	0.0122	5.04	0.91	110
6/2/2020	0.15	14,900	2.36	0.687	44.5	37,800	0.0060	4.69	1.00	97
6/2/2020	0.16	15,500	2.71	0.726	44.4	38,800	0.0072	5.24	1.15	106
6/2/2020	0.23	15,400	4.99	1.300	60.7	46,400	0.0137	8.36	1.97	208
6/2/2020	0.16	15,800	2.66	0.716	46.5	39,600	0.0058	3.84	1.08	99
6/15/2021	0.13	13,300	3.01	0.594	42.1	49,300	0.0105	7.62	0.97	124
6/15/2021	0.10	11,200	2.95	0.818	35.4	38,300	0.0106	3.44	1.11	138
6/15/2021	0.19	12,200	3.70	1.020	44.4	45,400	0.0167	6.53	1.28	156
6/15/2021	0.14	12,300	3.31	0.516	47.9	50,800	0.0156	11.10	0.75	137
6/15/2021	0.18	11,800	4.55	1.380	47.3	44,400	0.0190	7.11	1.99	183
6/14/2022	0.12	13,400	3.46	0.552	43.3	47,300	0.0130	4.90	0.80	158
6/14/2022	0.14	15,500	3.55	0.427	46.9	51,400	0.0071	12.80	0.93	126
6/14/2022	0.11	15,800	3.72	0.542	57.4	54,000	0.0098	4.46	0.99	146
6/14/2022	0.20	15,800	5.31	1.230	67.0	49,900	0.0151	9.32	1.97	205
6/14/2022	0.16	15,100	4.39	1.170	54.4	48,000	0.0103	5.50	1.89	174
6/6/2023	0.16	15,900	3.14	1.210	32.4	38,900	0.0122	2.74	2.23	168
6/6/2023	0.23	17,300	3.82	2.110	50.1	41,400	0.0118	3.90	2.43	230
6/6/2023	0.22	16,800	4.64	1.950	44.8	41,200	0.0163	5.40	2.76	243
6/6/2023	0.18	18,000	3.66	1.580	50.7	44,100	0.0163	5.85	2.50	215
6/6/2023	0.17	18,900	2.77	1.500	43.2	46,000	0.0096	4.60	2.37	197

-continued-

Appendix E.4.—Continued.

Sample Date	Concentration (mg/kg dry weight)									
	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/3/2024	0.15	16,400	2.98	0.782	47.0	41,500	0.0132	7.77	0.97	172
6/3/2024	0.14	16,300	3.23	0.910	52.7	45,200	0.0138	6.11	1.06	180
6/3/2024	0.16	17,700	3.87	0.880	51.6	48,900	0.0160	10.60	1.16	193
6/3/2024	0.16	17,100	3.72	0.934	50.0	43,800	0.0119	5.10	1.14	194
6/3/2024	0.14	16,200	3.06	0.617	52.2	42,800	0.0101	5.26	0.87	148
6/10/2025	0.164	13,000	4.96	0.872	58	41000	0.0118	4.6	1.40	164
6/10/2025	0.088	11,600	1.41	0.446	53	32600	0.0054	13.9	<0.6	92.7
6/10/2025	0.117	12,200	2.29	0.702	78.3	35600	0.0055	5.3	<0.9	127
6/10/2025	0.153	12,800	4.41	0.799	65.7	40000	0.0093	12.5	1.24	200
6/10/2025	0.145	13,400	3.72	0.558	62.3	42100	0.0123	7.27	1.10	138

Appendix E.5.—Lower Sarah Creek sediment compositions, 2024–2025.

Particle Size Data							
Sample Date	% Clay	% Silt	% Sand	% Course Material (> 2 mm)	% Total Solids	% Total Organic Carbon	Acid Volatile Sulfide
							(mg/kg)
6/4/2024	1.10	7.30	89.40	2.20	ND	ND	ND
6/4/2024	1.00	4.80	93.10	1.10	ND	ND	ND
6/4/2024	3.10	31.20	65.00	0.70	ND	ND	ND
6/4/2024	2.80	43.80	53.30	0.10	ND	ND	ND
6/4/2024	1.40	13.30	77.50	7.80	ND	ND	ND
6/11/2025	6.91	5.35	85.85	1.89	69.8	ND	ND
6/11/2025	2.13	7.37	85.63	4.87	67.9	ND	ND
6/11/2025	8.97	16.85	74.18	0.00	76.9	ND	ND
6/11/2025	2.42	6.51	90.83	0.24	63.8	ND	ND
6/11/2025	1.64	4.02	94.34	0.00	66.9	ND	ND

Appendix E.6.–Lower Sarah Creek sediment element concentrations, 2024–2025.

Sample	Concentration (mg/kg dry weight)									
Date	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/4/2024	<0.10	16,400	3.90	0.540	36.2	31,900	0.0081	4.22	0.60	106
6/4/2024	0.12	17,000	4.71	0.706	41.9	33,800	0.0118	5.46	0.74	119
6/4/2024	0.20	21,400	5.70	0.896	61.3	44,900	0.0162	8.83	1.26	147
6/4/2024	0.16	19,300	6.10	0.732	54.6	41,300	0.0151	7.38	0.99	134
6/4/2024	0.13	18,900	4.72	0.671	46.5	37,100	0.0118	5.51	0.80	120
6/11/2025	0.19	11,700	5.32	0.652	86.3	41,300	0.0132	8.05	1.3	145
6/11/2025	0.12	11,300	3.44	0.490	66.3	37,000	0.0121	5.00	<0.9	116
6/11/2025	0.12	11,900	3.65	0.448	49.2	37,500	0.0134	5.89	<1.0	115
6/11/2025	0.08	12,400	3.70	0.582	36.3	28,500	0.0061	4.15	<0.7	111
6/11/2025	0.09	12,700	3.51	0.671	38.7	30,200	0.0046	4.05	<0.7	137

Appendix E.7.–Upper Sarah Creek sediment compositions, 2024–2025.

Particle Size Data							Acid
Sample	% Course				% Total	% Total	Volatiles
Date	% Clay	% Silt	% Sand	Material (> 2 mm)	Solids	Organic Carbon	Sulfide (mg/kg)
6/4/2024	4.60	41.90	52.00	1.50	ND	ND	ND
6/4/2024	6.70	52.00	40.00	1.30	ND	ND	ND
6/4/2024	3.70	50.70	45.60	0.00	ND	ND	ND
6/4/2024	4.90	42.50	52.60	0.00	ND	ND	ND
6/4/2024	4.70	47.90	47.40	0.00	ND	ND	ND
6/11/2025	10.01	43.61	45.11	1.27	53.8	ND	ND
6/11/2025	11.02	36.87	47.03	5.08	59.2	ND	ND
6/11/2025	9.25	26.36	57.68	6.71	51.6	ND	ND
6/11/2025	1.32	1.19	67.62	29.87	71.5	ND	ND
6/11/2025	9.75	48.99	40.19	1.07	50.4	ND	ND

Appendix E.8.–Upper Sarah Creek sediment elements concentrations, 2024–2025.

Sample	Concentration (mg/kg dry weight)									
Date	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/4/2024	0.18	19,050	5.55	0.587	52.9	48,000	0.0115	6.47	0.80	126
6/4/2024	0.20	22,800	7.21	0.837	61.3	55,200	0.0173	8.83	1.14	157
6/4/2024	0.22	19,900	6.20	0.894	64.0	45,700	0.0193	8.11	1.17	145
6/4/2024	0.20	21,800	7.41	0.910	64.8	48,900	0.0186	8.12	1.15	157
6/4/2024	0.24	21,100	7.10	0.915	63.2	48,900	0.0203	9.29	1.18	155
6/11/2025	0.20	16,000	6.17	0.833	61.3	41,900	0.0135	8.58	<1.3	136
6/11/2025	0.13	11,500	4.17	0.776	42.4	28,600	0.0103	5.46	<1.2	104
6/11/2025	0.16	14,800	5.50	0.754	51.4	36,100	0.0166	6.69	<1.1	125
6/11/2025	0.09	10,600	3.01	0.624	30.3	25,300	0.0035	3.39	<0.6	90
6/11/2025	0.19	15,100	5.90	0.774	61.5	37,400	0.0127	7.72	<1.3	128

Appendix E.9.–Plateau Creek sediment compositions, 2024–2025.

Particle Size Data								Acid
Sample					% Course	% Total	% Total	Volatiles
	Date	% Clay	% Silt	% Sand	Material (> 2 mm)	% Total Solids	Organic Carbon	Sulfide (mg/kg)
6/4/2024		3.20	26.60	60.90	9.30	ND	ND	ND
6/4/2024		1.70	11.70	64.00	22.60	ND	ND	ND
6/4/2024		1.90	14.30	78.80	5.00	ND	ND	ND
6/4/2024		1.50	7.60	84.80	6.10	ND	ND	ND
6/4/2024		1.00	2.60	82.60	13.80	ND	ND	ND
6/11/2025		2.00	2.09	74.50	21.41	66.3	ND	ND
6/11/2025		8.00	13.07	60.46	18.47	29.6	ND	ND
6/11/2025		1.74	3.48	68.76	26.02	86.7	ND	ND
6/11/2025		2.33	4.61	49.18	43.88	66.5	ND	ND
6/11/2025		2.31	3.28	51.31	43.10	68.9	ND	ND

Appendix E.10.–Plateau Creek sediment elements concentrations, 2024–2025.

Sample	Concentration (mg/kg dry weight)									
Date	Ag	Al	As	Cd	Cu	Fe	Hg	Pb	Se	Zn
6/4/2024	0.16	20,000	5.82	0.628	50.9	46,800	0.0102	6.74	0.75	122
6/4/2024	0.18	21,600	6.34	0.770	57.4	48,600	0.0150	8.29	1.00	141
6/4/2024	0.18	20,200	5.88	0.827	55.9	42,000	0.0151	7.67	1.04	133
6/4/2024	<0.10	19,200	2.94	0.458	23.1	44,100	0.0086	6.58	0.38	139
6/4/2024	<0.10	19,100	3.17	0.552	18.8	41,200	0.0065	6.72	0.32	133
6/11/2025	0.09	11,400	3.28	0.576	23.4	28,600	0.0104	5.42	<0.8	116
6/11/2025	0.18	12,300	3.60	0.670	28.3	32,200	0.0793	6.55	<1.2	125
6/11/2025	0.06	12,500	2.25	0.434	28.8	32,400	0.0066	4.72	<0.4	129
6/11/2025	0.06	14,000	3.03	0.491	21.8	36,200	0.0072	5.15	<0.3	128
6/11/2025	0.07	14,500	2.60	0.494	33.3	40,700	0.0115	5.31	<0.4	138



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July 29, 2025

Analytical Report for Service Request No: K2506168

Dylan Krull
Alaska Department of Fish and Game
Division of Habitat
802 3rd Street
P.O. Box 110024
Douglas, AK 99811-0024

RE: Palmer Project

Dear Dylan,

Enclosed are the results of the sample(s) submitted to our laboratory June 18, 2025
For your reference, these analyses have been assigned our service request number **K2506168**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager



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Acronyms

Qualifiers

State Certifications, Accreditations, And Licenses

Case Narrative

Chain of Custody

Total Solids

General Chemistry

Metals

Raw Data

Total Solids

General Chemistry

Metals

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Received: 06/18/2025

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Twenty five soil samples were received for analysis at ALS Environmental on 06/18/2025. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

Method 6020B, 06/26/2025: The Relative Percent Difference (RPD) for the replicate analysis of numerous analytes in sample PLAT 1 was outside the normal ALS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noel D. O'Neil

Date 07/29/2025



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SR# _____

COC Set _____ of _____

COC# _____

Page 1 of 1

K2506168

Project Name Palmer Project		Project Number:	
Project Manager Dylan Krull			
Company Alaska Dept of Fish & Game			
Address, City, State PO Box 110024 Juneau AK 99811			
Phone # 907 465 6160		email dylan.krull@alaska.gov	
Sampler Signature D. Krull		Sampler Printed Name Dylan Krull	

CLIENT SAMPLE ID	LABID	SAMPLING Date Time State	Matrix		NUMBER OF CONTAINERS										Remarks				
					14D	28D	180D	365D	999D	821/R-91-100 / Sulfide AVS	9060 / TC	9060 / TIC Calc	9060 / TOC	6020B / Metals T		ASTM D422 / Part Size	1631app / Hg LL T	160.3 Modified / TS	
1. LGC 1		6/12/10	soil	3	X				X				X						
2. LGC 2					X				X				X						
3. LGC 3					X				X				X						
4. LGC 4					X				X				X						
5. LGC 5					X				X				X						
6. MGC 1		6/10/10			X				X				X						
7. MGC 2					X				X				X						
8. MGC 3					X				X				X						
9. MGC 4					X				X				X						
10. MGC 5					X				X				X						

Report Requirements

- ☒ I. Routine Report: Method Blank, Surrogate, as required
- ☒ II. Report Dup., MS, MSD as required
- ☐ III. CLP Like Summary (no raw data)
- ☒ IV. Data Validation Report
- ☐ V. EDD

Invoice Information

P.O.# _____

Bill To: _____

Kbenusa@constantine

rx@als.com

Turnaround Requirements

____ 24 hr. ____ 48 hr.

☒ Standard

Requested Report Date _____

Circle which metals are to be analyzed

Total Metals: ☒ Al ☒ As ☐ Sb ☐ Ba ☐ Be ☐ B ☐ Ca ☒ Cd ☐ Co ☐ Cr ☒ Cu ☒ Fe ☒ Pb ☐ Mg ☒ Mn ☐ Mo ☐ Ni ☐ K ☒ Ag ☒ Na ☒ Se ☐ Sr ☐ Ti ☐ Sn ☒ V ☒ Zn ☒ Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)

Send lab report to dylan.krull@alaska.gov

Relinquished By:

Received By:

Relinquished By:

Received By:

Relinquished By:

Received By:

Signature
D. Krull

Printed Name
Dylan Krull ADF&G

Firm
6/16/10

Date/Time
0900

Signature
Michelle Mito

Printed Name
Michelle Mito

Firm
ALS

Date/Time
6/16/10

Signature

Printed Name

Firm

Date/Time

Signature

Printed Name

Firm

Date/Time

Signature

Printed Name

Firm

Date/Time

Signature

Printed Name

Firm

Date/Time



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www.alsglobal.comSR# _____
COC Set _____ of _____
COC# _____

Page 1 of 1

K2506168

Project Name Palmer Project		Project Number:		NUMBER OF CONTAINERS		14D		28D		180D		365D		999D		Remarks		
Project Manager Dylan Krull						B2 / IR-91-100 / Sulfide AVS		9060 / TC		9060 / TIC Calc		9060 / TOC		3020B / Metals T			ASTM D422 / Part Size	
Company Alaska Dept of Fish & Game																		
Address, City, State PO Box 110024 Juneau AK 99811																		
Phone # 907 465 6100		email dylan.krull@alaska.gov																
Sampler Signature D. Krull		Sampler Printed Name Dylan Krull																
CLIENT SAMPLE ID	LABID	SAMPLING Date Time State	Matrix															
1. USAR 1		6/11 1000	Soil	3	X					X				X				
2. USAR 2					X					X				X				
3. USAR 3					X					X				X				
4. USAR 4					X					X				X				
5. USAR 5					X					X				X				
6. LSAR 1		6/11 1300			X					X				X				
7. LSAR 2					X					X				X				
8. LSAR 3					X					X				X				
9. LSAR 4					X					X				X				
10. LSAR 5					X					X				X				

Report Requirements

- ☒ I. Routine Report: Method Blank, Surrogate, as required
- ☒ II. Report Dup., MS, MSD as required
- ☐ III. CLP Like Summary (no raw data)
- ☒ IV. Data Validation Report
- ☐ V. EDD

Invoice Information

P.O.# _____
Bill To: _____
Kbenusa@constantine
metals.com

Turnaround Requirements

☐ 24 hr.
☐ 5 Day
☒ Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: ☒ Al ☒ As ☐ Sb ☐ Ba ☐ Be ☐ B ☐ Ca ☒ Co ☐ Cr ☒ Cu ☒ Fe ☒ Pb ☐ Mg ☒ Mn ☐ Mo ☐ Ni ☐ K ☒ Ag ☐ Na ☒ Se ☐ Sr ☐ Ti ☐ Sn ☐ V ☒ Zn ☒ Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)

Send lab report to dylan.krull@alaska.gov

Relinquished By:

Received By:

Relinquished By:

Received By:

Relinquished By:

Received By:

Signature D. Krull	Signature Mitob	Signature	Signature	Signature	Signature
Printed Name ADF3G	Printed Name Mitob	Printed Name	Printed Name	Printed Name	Printed Name
Firm 616 0900	Firm ALS	Firm	Firm	Firm	Firm
Date/Time	Date/Time 6/18/25	Date/Time	Date/Time	Date/Time	Date/Time

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068

www.alsglobal.com

[illegible]

42506168

Report Requirements	Invoice Information	Analysis Details
☒ I. Routine Report: Method Blank, Surrogate, as required ☐ II. Report Dup., MS, MSD as required ☐ III. CLP Like Summary (no raw data) ☒ IV. Data Validation Report ☐ V. EDD	P.O.# _____ Bill To: <u>K. Demusa O. Constantine</u> <u>metals.com</u> Turnaround Requirements ☐ 24 hr. ☐ 48 hr. ☒ Standard	Circle which metals are to be analyzed Total Metals: <u>Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg</u> Dissolved Metals: <u>Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg</u> Special Instructions/Comments: <u>Send lab report to Dylan.Krull@akshg.gov</u> *Indicate State Hydrocarbon Procedure: <u>AK CA WI Northwest Other</u> (Circle One)
Requested Report Date _____		

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: <u>Dylan Krull</u>	Signature: _____	Signature: _____	Signature: _____	Signature: _____	Signature: <u>Michael</u>
Printed Name: <u>ADFAG</u>	Printed Name: _____	Printed Name: _____	Printed Name: _____	Printed Name: _____	Printed Name: <u>Michael Mitob</u>
Firm: <u>6116 0900</u>	Firm: _____	Firm: _____	Firm: _____	Firm: _____	Firm: <u>ALG</u>
Date/Time: _____	Date/Time: _____	Date/Time: _____	Date/Time: _____	Date/Time: _____	Date/Time: <u>11/15/05</u>

Cooler Receipt and Preservation Form

PM MH

Client Alaska Dept. of Fish & Game Service Request K25 06168
 Received: 10/18/25 Opened: 10/18/25 By: NM Unloaded: 10/18/25 By: NM

1. Samples were received via? USPS Cooler Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other NA
 3. Were custody seals on coolers? NA X N If yes, how many and where? 1 Front
 If present, were custody seals intact? Y N If present, were they signed and dated? (Y) N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	<u>12.3</u>	<u>True</u>	<u>1 of 3</u>	<u>X</u>		<u>390043262242</u>	
	<u>16.4</u>	<u>1</u>	<u>2 of 3</u>	<u>X</u>		<u>390043262231</u>	
	<u>16.2</u>	<u>✓</u>	<u>3 of 3</u>	<u>X</u>		<u>390043262253</u>	

4. Was a Temperature Blank present in cooler? NA Y N If yes, note the temperature in the appropriate column below:

If no, take the temperature of a representative sample bottle contained within the cooler; note in the column "Sample Temp":

5. Were samples received within the method specified temperature ranges?

NA Y N
NA Y N

If no, were they received on ice and same day as collected? If not, note the cooler # below and notify the PM.

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

6. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves

7. Were custody papers properly filled out (ink, signed, etc.)?

NA Y N

8. Were samples received in good condition (unbroken)?

NA Y N

9. Were all sample labels complete (ie, analysis, preservation, etc.)?

NA Y N

10. Did all sample labels and tags agree with custody papers?

NA Y N

11. Were appropriate bottles/containers and volumes received for the tests indicated?

NA Y N

12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below

NA Y N

13. Were VOA vials received without headspace? Indicate in the table below.

NA Y N

14. Was C12/Res negative?

NA Y N

15. Were samples received within method specified time limit? If not, note the error below and notify the PM.

NA Y N

16. Were 100mL sterile microbiology bottles filled exactly to the 100mL mark? NA Y N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
<u>MGC 3</u>	<u>1 80Z jar</u>		<u>X</u>						
<u>MGC 4</u>	<u>1</u>		<u>X</u>						

Notes, Discrepancies, Resolutions: _____



Total Solids

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K2506168
Date Collected: 06/10/25 - 06/12/25
Date Received: 06/18/25
Units: Percent
Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
LGC 1	K2506168-001	75.3	-	-	1	06/19/25 11:52	
LGC 2	K2506168-002	69.0	-	-	1	06/19/25 11:52	
LGC 3	K2506168-003	69.4	-	-	1	06/19/25 11:52	
LGC 4	K2506168-004	72.2	-	-	1	06/19/25 11:52	
LGC 5	K2506168-005	72.4	-	-	1	06/19/25 11:52	
MGC 1	K2506168-006	72.9	-	-	1	06/19/25 11:52	
MGC 2	K2506168-007	78.3	-	-	1	06/19/25 11:52	
MGC 3	K2506168-008	84.7	-	-	1	06/19/25 11:52	
MGC 4	K2506168-009	75.0	-	-	1	06/19/25 11:52	
MGC 5	K2506168-010	75.8	-	-	1	06/19/25 11:52	
USAR 1	K2506168-011	53.8	-	-	1	06/19/25 11:52	
USAR 2	K2506168-012	59.2	-	-	1	06/19/25 11:52	
USAR 3	K2506168-013	51.6	-	-	1	06/19/25 11:52	
USAR 4	K2506168-014	71.5	-	-	1	06/19/25 11:52	
USAR 5	K2506168-015	50.4	-	-	1	06/19/25 11:52	
LSAR 1	K2506168-016	69.8	-	-	1	06/19/25 11:52	
LSAR 2	K2506168-017	67.9	-	-	1	06/19/25 11:52	
LSAR 3	K2506168-018	76.9	-	-	1	06/19/25 11:52	
LSAR 4	K2506168-019	63.8	-	-	1	06/19/25 11:52	
LSAR 5	K2506168-020	66.9	-	-	1	06/19/25 11:52	
PLAT 1	K2506168-021	66.3	-	-	1	06/19/25 14:56	
PLAT 2	K2506168-022	29.6	-	-	1	06/19/25 14:56	
PLAT 3	K2506168-023	86.7	-	-	1	06/19/25 14:56	
PLAT 4	K2506168-024	66.5	-	-	1	06/19/25 14:56	
PLAT 5	K2506168-025	68.9	-	-	1	06/19/25 14:56	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project Palmer Project
Sample Matrix: Sediment

Analysis Method: 160.3 Modified
Prep Method: None

Service Request:K2506168
Date Collected:06/11/25 - 06/12/25
Date Received:06/18/25

Units:Percent
Basis:As Received

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
LGC 1	K2506168-001DUP	-	75.3	73.8	74.6	2	20	06/19/25
LSAR 5	K2506168-020DUP	-	66.9	64.5	65.7	4	20	06/19/25
PLAT 1	K2506168-021DUP	-	66.3	63.4	64.9	4	20	06/19/25

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil
Analysis Method: 821/R-91-100
Prep Method: Method

Service Request: K2506168
Date Collected: 06/10/25 - 06/12/25
Date Received: 06/18/25
Units: uMole/g
Basis: Dry

Sulfide, Acid-Volatile

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
LGC 1	K2506168-001	ND U	0.020	0.005	1	06/26/25 19:50	6/26/25	
LGC 2	K2506168-002	ND U	0.023	0.006	1	06/26/25 19:50	6/26/25	
LGC 3	K2506168-003	ND U	0.022	0.006	1	06/26/25 19:50	6/26/25	
LGC 4	K2506168-004	ND U	0.021	0.006	1	06/26/25 19:50	6/26/25	
LGC 5	K2506168-005	ND U	0.022	0.006	1	06/26/25 19:50	6/26/25	
MGC 1	K2506168-006	ND U	0.021	0.006	1	06/24/25 20:55	6/24/25	
MGC 2	K2506168-007	ND U	0.020	0.006	1	06/24/25 20:55	6/24/25	
MGC 3	K2506168-008	ND U	0.018	0.005	1	06/24/25 20:55	6/24/25	
MGC 4	K2506168-009	ND U	0.020	0.005	1	06/24/25 20:55	6/24/25	
MGC 5	K2506168-010	ND U	0.021	0.006	1	06/24/25 20:55	6/24/25	
USAR 1	K2506168-011	ND U	0.029	0.008	1	06/24/25 20:55	6/24/25	
USAR 2	K2506168-012	ND U	0.026	0.007	1	06/24/25 20:55	6/24/25	
USAR 3	K2506168-013	ND U	0.029	0.008	1	06/24/25 20:55	6/24/25	
USAR 4	K2506168-014	ND U	0.021	0.006	1	06/24/25 20:55	6/24/25	
USAR 5	K2506168-015	ND U	0.031	0.008	1	06/24/25 20:55	6/24/25	
LSAR 1	K2506168-016	ND U	0.022	0.006	1	06/24/25 20:55	6/24/25	
LSAR 2	K2506168-017	ND U	0.023	0.006	1	06/24/25 20:55	6/24/25	
LSAR 3	K2506168-018	ND U	0.021	0.006	1	06/24/25 20:55	6/24/25	
LSAR 4	K2506168-019	ND U	0.025	0.007	1	06/24/25 20:55	6/24/25	
LSAR 5	K2506168-020	ND U	0.023	0.006	1	06/24/25 20:55	6/24/25	
PLAT 1	K2506168-021	ND U	0.022	0.006	1	06/24/25 20:55	6/24/25	
PLAT 2	K2506168-022	ND U	0.052	0.014	1	06/24/25 20:55	6/24/25	
PLAT 3	K2506168-023	ND U	0.018	0.005	1	06/24/25 20:55	6/24/25	
PLAT 4	K2506168-024	ND U	0.023	0.006	1	06/24/25 20:55	6/24/25	
PLAT 5	K2506168-025	ND U	0.022	0.006	1	06/24/25 20:55	6/24/25	
Method Blank	K2506168-MB1	ND U	0.016	0.004	1	06/24/25 20:55	6/24/25	
Method Blank	K2506168-MB2	ND U	0.016	0.004	1	06/26/25 19:50	6/26/25	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project Palmer Project
Sample Matrix: Soil

Analysis Method: 821/R-91-100
Prep Method: Method

Service Request:K2506168
Date Collected:06/11/25 - 06/12/25
Date Received:06/18/25

Units:uMole/g
Basis:Dry

Replicate Sample Summary
Sulfide, Acid-Volatile

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
LGC 5	K2506168-005DUP	0.021	0.006	ND U	ND U	NC	NC	45	06/26/25
USAR 1	K2506168-011DUP	0.029	0.008	ND U	ND U	NC	NC	45	06/24/25

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/26/25
Date Extracted: 06/26/25

Duplicate Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name: LGC 5
Lab Code: K2506168-005
Analysis Method: 821/R-91-100
Prep Method: Method

Units: uMole/g
Basis: Dry

Analyte Name	Sample Result	Result	Matrix Spike K2506168-005MS		Result	Duplicate Matrix Spike K2506168-005DMS		% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec		Spike Amount	% Rec			
Sulfide, Acid-Volatile	ND U	7.1	7.2	98	7.2	7.5	96	56-142	2	45

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/24/25
Date Extracted: 06/24/25

Duplicate Matrix Spike Summary
Sulfide, Acid-Volatile

Sample Name: USAR 1
Lab Code: K2506168-011
Analysis Method: 821/R-91-100
Prep Method: Method

Units: uMole/g
Basis: Dry

Analyte Name	Sample Result	Result	Matrix Spike K2506168-011MS		Result	Duplicate Matrix Spike K2506168-011DMS		% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec		Spike Amount	% Rec			
Sulfide, Acid-Volatile	ND U	9.7	10.1	96	9.7	10.2	95	56-142	<1	45

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Analyzed: 06/24/25
Date Extracted: 06/24/25

Lab Control Sample Summary
Sulfide, Acid-Volatile

Analysis Method: 821/R-91-100
Prep Method: Method

Units: uMole/g
Basis: Dry
Analysis Lot: 883864

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2506168-LCS1	10.3	11.1	92	60-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Analyzed: 06/26/25
Date Extracted: 06/26/25

Lab Control Sample Summary
Sulfide, Acid-Volatile

Analysis Method: 821/R-91-100
Prep Method: Method

Units: uMole/g
Basis: Dry
Analysis Lot: 884201

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2506168-LCS2	10.9	11.1	98	60-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

Continuing Calibration Verification (CCV) Summary

Sulfide, Acid-Volatile

Analysis Method: 821/R-91-100

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	883864	KQ2511011-01	06/24/25 20:55	1.79	1.80	101	90-110
CCV2	883864	KQ2511011-02	06/24/25 20:55	1.79	1.79	100	90-110
CCV3	883864	KQ2511011-03	06/24/25 20:55	1.79	1.79	100	90-110
CCV4	883864	KQ2511011-04	06/24/25 20:55	1.79	1.79	100	90-110
CCV5	884201	KQ2511221-01	06/26/25 19:50	1.78	1.72	97	90-110
CCV6	884201	KQ2511221-02	06/26/25 19:50	1.78	1.73	97	90-110
CCV7	884201	KQ2511221-03	06/26/25 19:50	1.78	1.74	98	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request:K2506168

Continuing Calibration Blank (CCB) Summary
Sulfide, Acid-Volatile

Analysis Method: 821/R-91-100

Units:uMole/g

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	883864	KQ2511011-05	06/24/25 20:55	0.016	0.004	ND	U
CCB2	883864	KQ2511011-06	06/24/25 20:55	0.016	0.004	ND	U
CCB3	883864	KQ2511011-07	06/24/25 20:55	0.016	0.004	ND	U
CCB4	883864	KQ2511011-08	06/24/25 20:55	0.016	0.004	ND	U
CCB5	884201	KQ2511221-04	06/26/25 19:50	0.016	0.004	ND	U
CCB6	884201	KQ2511221-05	06/26/25 19:50	0.016	0.004	ND	U
CCB7	884201	KQ2511221-06	06/26/25 19:50	0.016	0.004	ND	U

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 1
Lab Code: K2506168-001

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.02
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.02
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.02
Gravel, Fine	No.10 (2.00 mm)	0.2086	99.60
Sand, Very Coarse	No.20 (0.850 mm)	0.4742	98.66
Sand, Coarse	No.40 (0.425 mm)	1.8934	94.88
Sand, Medium	No.60 (0.250 mm)	5.2783	84.36
Sand, Fine	No.140 (0.106 mm)	17.8425	48.79
Sand, Very Fine	No.200 (0.0750 mm)	6.9286	34.97

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	30.09
0.005 mm	5.36
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 1
Lab Code: K2506168-001DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.2474	99.51
Sand, Very Coarse	No.20 (0.850 mm)	0.4840	98.54
Sand, Coarse	No.40 (0.425 mm)	1.8098	94.94
Sand, Medium	No.60 (0.250 mm)	5.6629	83.66
Sand, Fine	No.140 (0.106 mm)	18.3870	47.02
Sand, Very Fine	No.200 (0.0750 mm)	6.8495	33.38

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	28.95
0.005 mm	5.27
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 2
Lab Code: K2506168-002

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.1336	99.74
Sand, Coarse	No.40 (0.425 mm)	3.7952	92.23
Sand, Medium	No.60 (0.250 mm)	10.4533	71.56
Sand, Fine	No.140 (0.106 mm)	17.0024	37.94
Sand, Very Fine	No.200 (0.0750 mm)	4.6643	28.71

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	24.90
0.005 mm	5.11
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 3
Lab Code: K2506168-003

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.2452	99.51
Gravel, Fine	No.10 (2.00 mm)	0.3499	98.82
Sand, Very Coarse	No.20 (0.850 mm)	3.6663	91.57
Sand, Coarse	No.40 (0.425 mm)	14.5512	62.80
Sand, Medium	No.60 (0.250 mm)	15.5412	32.07
Sand, Fine	No.140 (0.106 mm)	11.6881	8.96
Sand, Very Fine	No.200 (0.0750 mm)	1.6095	5.78

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	4.62
0.005 mm	3.69
0.001 mm	3.14

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 4
Lab Code: K2506168-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.3001	99.40
Sand, Very Coarse	No.20 (0.850 mm)	1.9574	95.51
Sand, Coarse	No.40 (0.425 mm)	10.9299	73.75
Sand, Medium	No.60 (0.250 mm)	14.7833	44.31
Sand, Fine	No.140 (0.106 mm)	15.4215	13.61
Sand, Very Fine	No.200 (0.0750 mm)	2.3226	8.99

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	8.37
0.005 mm	3.69
0.001 mm	0.90

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LGC 5
Lab Code: K2506168-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.0923	99.82
Sand, Coarse	No.40 (0.425 mm)	1.0656	97.71
Sand, Medium	No.60 (0.250 mm)	7.3356	83.17
Sand, Fine	No.140 (0.106 mm)	21.7390	40.11
Sand, Very Fine	No.200 (0.0750 mm)	6.3509	27.53

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	24.89
0.005 mm	5.23
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/10/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: MGC 1
Lab Code: K2506168-006

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.99
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.99
Gravel, Medium	No.4 (4.75 mm)	0.0000	99.99
Gravel, Fine	No.10 (2.00 mm)	0.6472	98.70
Sand, Very Coarse	No.20 (0.850 mm)	1.6081	95.50
Sand, Coarse	No.40 (0.425 mm)	2.9748	89.57
Sand, Medium	No.60 (0.250 mm)	3.3927	82.81
Sand, Fine	No.140 (0.106 mm)	9.8327	63.21
Sand, Very Fine	No.200 (0.0750 mm)	4.8276	53.59

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	53.39
0.005 mm	8.74
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/10/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: MGC 2
Lab Code: K2506168-007

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.1604	99.68
Gravel, Fine	No.10 (2.00 mm)	2.9525	93.83
Sand, Very Coarse	No.20 (0.850 mm)	4.5896	84.71
Sand, Coarse	No.40 (0.425 mm)	4.4322	75.91
Sand, Medium	No.60 (0.250 mm)	6.3185	63.36
Sand, Fine	No.140 (0.106 mm)	13.8626	35.82
Sand, Very Fine	No.200 (0.0750 mm)	4.6618	26.56

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	22.98
0.005 mm	5.13
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/10/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: MGC 3
Lab Code: K2506168-008

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.53
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.53
Gravel, Medium	No.4 (4.75 mm)	2.1916	95.17
Gravel, Fine	No.10 (2.00 mm)	7.7176	79.83
Sand, Very Coarse	No.20 (0.850 mm)	6.8263	66.32
Sand, Coarse	No.40 (0.425 mm)	10.4599	45.61
Sand, Medium	No.60 (0.250 mm)	8.0948	29.59
Sand, Fine	No.140 (0.106 mm)	9.1374	11.50
Sand, Very Fine	No.200 (0.0750 mm)	1.7638	8.01

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	7.80
0.005 mm	3.76
0.001 mm	1.35

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/10/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: MGC 4
Lab Code: K2506168-009

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0699	99.86
Sand, Very Coarse	No.20 (0.850 mm)	0.2250	99.42
Sand, Coarse	No.40 (0.425 mm)	0.9022	97.63
Sand, Medium	No.60 (0.250 mm)	4.1546	89.43
Sand, Fine	No.140 (0.106 mm)	20.6118	48.71
Sand, Very Fine	No.200 (0.0750 mm)	7.8819	33.15

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	29.66
0.005 mm	6.63
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/10/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: MGC 5
Lab Code: K2506168-010

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.2685	99.47
Sand, Coarse	No.40 (0.425 mm)	2.0129	95.47
Sand, Medium	No.60 (0.250 mm)	8.4764	78.63
Sand, Fine	No.140 (0.106 mm)	21.3059	36.32
Sand, Very Fine	No.200 (0.0750 mm)	5.8652	24.67

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	22.44
0.005 mm	5.34
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: USAR 1
Lab Code: K2506168-011

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.68
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.68
Gravel, Medium	No.4 (4.75 mm)	0.0000	99.68
Gravel, Fine	No.10 (2.00 mm)	0.4766	98.73
Sand, Very Coarse	No.20 (0.850 mm)	0.8121	97.09
Sand, Coarse	No.40 (0.425 mm)	0.9084	95.26
Sand, Medium	No.60 (0.250 mm)	2.6887	89.84
Sand, Fine	No.140 (0.106 mm)	12.5721	64.51
Sand, Very Fine	No.200 (0.0750 mm)	5.4029	53.62

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	53.57
0.005 mm	10.01
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: USAR 2
Lab Code: K2506168-012

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.87
Gravel (9.50 mm)	No.3/8"(9.50 mm)	1.3028	97.28
Gravel, Medium	No.4 (4.75 mm)	0.0000	97.28
Gravel, Fine	No.10 (2.00 mm)	1.1928	94.92
Sand, Very Coarse	No.20 (0.850 mm)	2.6695	89.58
Sand, Coarse	No.40 (0.425 mm)	3.0948	83.39
Sand, Medium	No.60 (0.250 mm)	3.2832	76.83
Sand, Fine	No.140 (0.106 mm)	10.1300	56.57
Sand, Very Fine	No.200 (0.0750 mm)	4.3426	47.89

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	47.54
0.005 mm	11.02
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: USAR 3
Lab Code: K2506168-013

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.53
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.53
Gravel, Medium	No.4 (4.75 mm)	1.8121	95.91
Gravel, Fine	No.10 (2.00 mm)	1.3152	93.29
Sand, Very Coarse	No.20 (0.850 mm)	7.6927	77.91
Sand, Coarse	No.40 (0.425 mm)	4.7506	68.41
Sand, Medium	No.60 (0.250 mm)	4.1639	60.09
Sand, Fine	No.140 (0.106 mm)	8.9050	42.29
Sand, Very Fine	No.200 (0.0750 mm)	3.3398	35.61

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	36.47
0.005 mm	9.25
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: USAR 4
Lab Code: K2506168-014

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	8.7794	91.30
Gravel, Medium	No.4 (4.75 mm)	8.7599	82.62
Gravel, Fine	No.10 (2.00 mm)	12.6117	70.13
Sand, Very Coarse	No.20 (0.850 mm)	34.7583	35.55
Sand, Coarse	No.40 (0.425 mm)	21.5396	14.12
Sand, Medium	No.60 (0.250 mm)	6.4498	7.70
Sand, Fine	No.140 (0.106 mm)	4.5805	3.14
Sand, Very Fine	No.200 (0.0750 mm)	0.6336	2.51

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	2.42
0.005 mm	1.32
0.001 mm	0.67

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: USAR 5
Lab Code: K2506168-015

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.97
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.97
Gravel, Medium	No.4 (4.75 mm)	0.0000	99.97
Gravel, Fine	No.10 (2.00 mm)	0.0202	99.93
Sand, Very Coarse	No.20 (0.850 mm)	0.4892	98.94
Sand, Coarse	No.40 (0.425 mm)	0.2427	98.45
Sand, Medium	No.60 (0.250 mm)	0.9237	96.59
Sand, Fine	No.140 (0.106 mm)	12.2073	72.01
Sand, Very Fine	No.200 (0.0750 mm)	6.5850	58.74

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	58.14
0.005 mm	9.75
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 1
Lab Code: K2506168-016

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.97
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.97
Gravel, Medium	No.4 (4.75 mm)	0.1892	99.60
Gravel, Fine	No.10 (2.00 mm)	0.7561	98.11
Sand, Very Coarse	No.20 (0.850 mm)	4.6123	89.00
Sand, Coarse	No.40 (0.425 mm)	5.5711	78.00
Sand, Medium	No.60 (0.250 mm)	9.0037	60.23
Sand, Fine	No.140 (0.106 mm)	21.0811	18.61
Sand, Very Fine	No.200 (0.0750 mm)	3.2188	12.26

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	11.68
0.005 mm	6.91
0.001 mm	4.06

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 2
Lab Code: K2506168-017

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.9914	99.01
Gravel, Fine	No.10 (2.00 mm)	3.8854	95.13
Sand, Very Coarse	No.20 (0.850 mm)	17.8021	77.30
Sand, Coarse	No.40 (0.425 mm)	16.7305	60.54
Sand, Medium	No.60 (0.250 mm)	19.9006	40.61
Sand, Fine	No.140 (0.106 mm)	26.9272	13.63
Sand, Very Fine	No.200 (0.0750 mm)	4.1294	9.50

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	9.06
0.005 mm	2.13
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 3
Lab Code: K2506168-018

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.0233	99.95
Sand, Coarse	No.40 (0.425 mm)	0.9151	98.14
Sand, Medium	No.60 (0.250 mm)	9.2954	79.70
Sand, Fine	No.140 (0.106 mm)	22.4316	35.19
Sand, Very Fine	No.200 (0.0750 mm)	4.7217	25.82

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	24.13
0.005 mm	8.97
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 4
Lab Code: K2506168-019

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.2424	99.76
Sand, Very Coarse	No.20 (0.850 mm)	2.5832	97.17
Sand, Coarse	No.40 (0.425 mm)	23.6510	73.46
Sand, Medium	No.60 (0.250 mm)	40.8853	32.46
Sand, Fine	No.140 (0.106 mm)	21.0215	11.39
Sand, Very Fine	No.200 (0.0750 mm)	2.4537	8.93

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	8.46
0.005 mm	2.42
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 5
Lab Code: K2506168-020

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.7305	99.27
Sand, Coarse	No.40 (0.425 mm)	21.3383	77.98
Sand, Medium	No.60 (0.250 mm)	45.1109	32.97
Sand, Fine	No.140 (0.106 mm)	24.9080	8.12
Sand, Very Fine	No.200 (0.0750 mm)	2.4671	5.66

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	5.53
0.005 mm	1.64
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: LSAR 5
Lab Code: K2506168-020DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	0.0000	100.00
Gravel, Fine	No.10 (2.00 mm)	0.0000	100.00
Sand, Very Coarse	No.20 (0.850 mm)	0.6990	99.30
Sand, Coarse	No.40 (0.425 mm)	23.7263	75.61
Sand, Medium	No.60 (0.250 mm)	42.8076	32.86
Sand, Fine	No.140 (0.106 mm)	25.1476	7.75
Sand, Very Fine	No.200 (0.0750 mm)	2.2413	5.51

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	5.02
0.005 mm	2.15
0.001 mm	0.44

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/23/25

Particle Size Determination
ASTM D422

Sample Name: PLAT 1
Lab Code: K2506168-021

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	98.98
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	98.98
Gravel, Medium	No.4 (4.75 mm)	4.5914	89.88
Gravel, Fine	No.10 (2.00 mm)	5.6929	78.59
Sand, Very Coarse	No.20 (0.850 mm)	12.0490	54.88
Sand, Coarse	No.40 (0.425 mm)	15.4873	24.39
Sand, Medium	No.60 (0.250 mm)	7.0408	10.54
Sand, Fine	No.140 (0.106 mm)	2.8999	4.83
Sand, Very Fine	No.200 (0.0750 mm)	0.3742	4.09

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	5.92
0.005 mm	2.00
0.001 mm	0.00

ALS Group USA, Corp.
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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: PLAT 2
Lab Code: K2506168-022

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	2.4508	93.92
Gravel, Medium	No.4 (4.75 mm)	0.3174	93.13
Gravel, Fine	No.10 (2.00 mm)	4.6760	81.53
Sand, Very Coarse	No.20 (0.850 mm)	5.9330	66.10
Sand, Coarse	No.40 (0.425 mm)	6.0965	50.25
Sand, Medium	No.60 (0.250 mm)	5.2369	36.63
Sand, Fine	No.140 (0.106 mm)	4.8430	24.03
Sand, Very Fine	No.200 (0.0750 mm)	1.1384	21.07

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	20.08
0.005 mm	8.00
0.001 mm	0.79

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: PLAT 3
Lab Code: K2506168-023

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.98
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.98
Gravel, Medium	No.4 (4.75 mm)	9.0937	90.89
Gravel, Fine	No.10 (2.00 mm)	16.9256	73.98
Sand, Very Coarse	No.20 (0.850 mm)	24.8827	48.90
Sand, Coarse	No.40 (0.425 mm)	24.9243	23.77
Sand, Medium	No.60 (0.250 mm)	11.5255	12.16
Sand, Fine	No.140 (0.106 mm)	5.9236	6.18
Sand, Very Fine	No.200 (0.0750 mm)	0.9524	5.22

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	5.01
0.005 mm	1.74
0.001 mm	0.00

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: PLAT 4
Lab Code: K2506168-024

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	18.2414	81.78
Gravel, Medium	No.4 (4.75 mm)	11.9237	69.87
Gravel, Fine	No.10 (2.00 mm)	13.6869	56.19
Sand, Very Coarse	No.20 (0.850 mm)	15.1832	40.85
Sand, Coarse	No.40 (0.425 mm)	14.8290	25.86
Sand, Medium	No.60 (0.250 mm)	10.9767	14.76
Sand, Fine	No.140 (0.106 mm)	6.5122	8.18
Sand, Very Fine	No.200 (0.0750 mm)	1.2273	6.94

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	6.03
0.005 mm	2.33
0.001 mm	0.11

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 07/24/25

Particle Size Determination
ASTM D422

Sample Name: PLAT 5
Lab Code: K2506168-025

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	100.00
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	100.00
Gravel, Medium	No.4 (4.75 mm)	6.8042	93.21
Gravel, Fine	No.10 (2.00 mm)	36.3998	56.90
Sand, Very Coarse	No.20 (0.850 mm)	26.0718	30.66
Sand, Coarse	No.40 (0.425 mm)	12.3136	18.26
Sand, Medium	No.60 (0.250 mm)	7.1496	11.07
Sand, Fine	No.140 (0.106 mm)	4.5886	6.45
Sand, Very Fine	No.200 (0.0750 mm)	0.8538	5.59

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	5.09
0.005 mm	2.31
0.001 mm	0.65



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25

Mercury, Total

Prep Method: METHOD
Analysis Method: 1631E
Test Notes:

Units: ng/g
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
LGC 1	K2506168-001	1.0	0.2	1	06/23/25	06/24/25	5.3	
LGC 2	K2506168-002	1.1	0.2	1	06/23/25	06/24/25	13.3	
LGC 3	K2506168-003	1.0	0.2	1	06/23/25	06/24/25	10.6	
LGC 4	K2506168-004	1.0	0.2	1	06/23/25	06/24/25	11.3	
LGC 5	K2506168-005	1.0	0.2	1	06/23/25	06/24/25	12.1	
MGC 1	K2506168-006	1.1	0.2	1	06/23/25	06/24/25	11.8	
MGC 2	K2506168-007	1.0	0.2	1	06/23/25	06/24/25	5.4	
MGC 3	K2506168-008	1.0	0.2	1	06/23/25	06/24/25	5.5	
MGC 4	K2506168-009	1.0	0.2	1	06/23/25	06/24/25	9.3	
MGC 5	K2506168-010	1.0	0.2	1	06/23/25	06/24/25	12.3	
USAR 1	K2506168-011	1.1	0.2	1	06/23/25	06/24/25	13.5	
USAR 2	K2506168-012	1.0	0.2	1	06/23/25	06/24/25	10.3	
USAR 3	K2506168-013	1.4	0.3	1	06/23/25	06/24/25	16.6	
USAR 4	K2506168-014	1.1	0.2	1	06/23/25	06/24/25	3.5	
USAR 5	K2506168-015	1.4	0.3	1	06/23/25	06/24/25	12.7	
LSAR 1	K2506168-016	1.0	0.2	1	06/23/25	06/24/25	13.2	
LSAR 2	K2506168-017	1.2	0.2	1	06/23/25	06/24/25	12.1	
LSAR 3	K2506168-018	1.0	0.2	1	6/23/2025	6/24/2025	13.4	
LSAR 4	K2506168-019	1.1	0.2	1	6/23/2025	6/24/2025	6.1	
LSAR 5	K2506168-020	1.1	0.2	1	6/23/2025	6/24/2025	4.6	
Method Blank 1	K2506168-MB1	1.0	0.2	1	6/23/2025	6/24/2025	ND	
Method Blank 2	K2506168-MB2	1.0	0.2	1	6/23/2025	6/24/2025	ND	
Method Blank 3	K2506168-MB3	1.0	0.2	1	6/23/2025	6/24/2025	ND	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name: LGC 1 Units: ng/g
Lab Code: K2506168-001MS, K2506168-001DMS Basis: Dry
Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		ALS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Mercury	METHOD	1631E	3.8	188	189	5.3	196	205	101	106	70-130	4	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name: USAR 1
Lab Code: K2506168-011MS, K2506168-011DMS
Test Notes: Units: ng/g
Basis: Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		ALS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Mercury	METHOD	1631E	5.9	302	297	13.5	304	349	96	113	70-130	14	

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Water

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Initial) **Units:** ng/g
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery	Result Notes
						Acceptance Limits	
Mercury	METHOD	1631E	5.00	5.10	102	70-130	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Water

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Final) **Units:** ng/g
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery	Result Notes
						Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.78	96	70-130	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Soil

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Quality Control Sample (QCS) Summary
Total Metals

Sample Name: Quality Control Sample

Units: ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	5.02	100	70-130	

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25

Mercury, Total

Prep Method: METHOD
Analysis Method: 1631E
Test Notes:

Units: ng/g
Basis: Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
PLAT 1	K2506168-021	1.1	0.2	1	06/23/25	06/24/25	10.4	
PLAT 2	K2506168-022	2.7	0.5	1	06/23/25	06/24/25	79.3	
PLAT 3	K2506168-023	1.0	0.2	1	06/23/25	06/24/25	6.6	
PLAT 4	K2506168-024	1.2	0.2	1	06/23/25	06/24/25	7.2	
PLAT 5	K2506168-025	1.1	0.2	1	06/23/25	06/24/25	11.5	
Method Blank 1	K2506168-MB1	1.0	0.2	1	06/23/25	06/24/25	ND	
Method Blank 2	K2506168-MB2	1.0	0.2	1	06/23/25	06/24/25	ND	
Method Blank 3	K2506168-MB3	1.0	0.2	1	06/23/25	06/24/25	ND	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name: PLAT 4 Units: ng/g
Lab Code: K2506168-024MS, K2506168-024DMS Basis: Dry
Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		ALS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Mercury	METHOD	1631E	5.2	260	259	7.2	253	265	95	100	70-130	5	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Water

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Initial) **Units:** ng/g
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery	Result Notes
						Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.82	96	70-130	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Water

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Final) **Units:** ng/g
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery	Result Notes
						Acceptance Limits	
Mercury	METHOD	1631E	5.00	5.13	103	70-130	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
LCS Matrix: Soil

Service Request: K2506168
Date Collected: NA
Date Received: NA
Date Extracted: 06/23/25
Date Analyzed: 06/24/25

Quality Control Sample (QCS) Summary
Total Metals

Sample Name: Quality Control Sample

Units: ng/L

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	5.16	103	70-130	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LGC 1
Lab Code: K2506168-001

Service Request: K2506168
Date Collected: 06/12/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11000	mg/Kg	3.8	1.0	10	06/26/25 13:59	06/20/25	
Arsenic	6020B	5.77	mg/Kg	0.47	0.05	10	06/26/25 13:59	06/20/25	
Cadmium	6020B	0.871	mg/Kg	0.038	0.006	10	06/26/25 13:59	06/20/25	
Copper	6020B	74.8	mg/Kg	0.38	0.12	10	06/26/25 13:59	06/20/25	
Iron	6020B	42200	mg/Kg	7.5	2.9	10	06/26/25 13:59	06/20/25	
Lead	6020B	7.64	mg/Kg	0.094	0.016	10	06/26/25 13:59	06/20/25	
Manganese	6020B	824	mg/Kg	0.094	0.043	10	06/26/25 13:59	06/20/25	
Selenium	6020B	1.73	mg/Kg	0.94	0.10	10	06/26/25 13:59	06/20/25	
Silver	6020B	0.177	mg/Kg	0.038	0.007	10	06/26/25 13:59	06/20/25	
Zinc	6020B	187	mg/Kg	0.94	0.17	10	06/26/25 13:59	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LGC 2
Lab Code: K2506168-002

Service Request: K2506168
Date Collected: 06/12/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12700	mg/Kg	5.6	1.5	10	06/26/25 14:11	06/20/25	
Arsenic	6020B	4.87	mg/Kg	0.70	0.07	10	06/26/25 14:11	06/20/25	
Cadmium	6020B	0.829	mg/Kg	0.056	0.009	10	06/26/25 14:11	06/20/25	
Copper	6020B	76.5	mg/Kg	0.56	0.18	10	06/26/25 14:11	06/20/25	
Iron	6020B	42400	mg/Kg	11	4	10	06/26/25 14:11	06/20/25	
Lead	6020B	5.48	mg/Kg	0.14	0.02	10	06/26/25 14:11	06/20/25	
Manganese	6020B	812	mg/Kg	0.14	0.06	10	06/26/25 14:11	06/20/25	
Selenium	6020B	1.6	mg/Kg	1.4	0.2	10	06/26/25 14:11	06/20/25	
Silver	6020B	0.159	mg/Kg	0.056	0.010	10	06/26/25 14:11	06/20/25	
Zinc	6020B	167	mg/Kg	1.4	0.3	10	06/26/25 14:11	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25 13:00
Date Received: 06/18/25 09:50

Sample Name: LGC 3
Lab Code: K2506168-003

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12000	mg/Kg	5.0	1.4	10	06/26/25 14:14	06/20/25	
Arsenic	6020B	4.21	mg/Kg	0.63	0.07	10	06/26/25 14:14	06/20/25	
Cadmium	6020B	0.622	mg/Kg	0.050	0.008	10	06/26/25 14:14	06/20/25	
Copper	6020B	54.9	mg/Kg	0.50	0.16	10	06/26/25 14:14	06/20/25	
Iron	6020B	37100	mg/Kg	10	4	10	06/26/25 14:14	06/20/25	
Lead	6020B	5.42	mg/Kg	0.13	0.02	10	06/26/25 14:14	06/20/25	
Manganese	6020B	801	mg/Kg	0.13	0.06	10	06/26/25 14:14	06/20/25	
Selenium	6020B	1.0 J	mg/Kg	1.3	0.1	10	06/26/25 14:14	06/20/25	
Silver	6020B	0.128	mg/Kg	0.050	0.009	10	06/26/25 14:14	06/20/25	
Zinc	6020B	135	mg/Kg	1.3	0.2	10	06/26/25 14:14	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LGC 4
Lab Code: K2506168-004

Service Request: K2506168
Date Collected: 06/12/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11300	mg/Kg	5.3	1.4	10	06/26/25 14:16	06/20/25	
Arsenic	6020B	4.93	mg/Kg	0.66	0.07	10	06/26/25 14:16	06/20/25	
Cadmium	6020B	0.970	mg/Kg	0.053	0.009	10	06/26/25 14:16	06/20/25	
Copper	6020B	51.2	mg/Kg	0.53	0.17	10	06/26/25 14:16	06/20/25	
Iron	6020B	37300	mg/Kg	11	4	10	06/26/25 14:16	06/20/25	
Lead	6020B	5.28	mg/Kg	0.13	0.02	10	06/26/25 14:16	06/20/25	
Manganese	6020B	787	mg/Kg	0.13	0.06	10	06/26/25 14:16	06/20/25	
Selenium	6020B	1.6	mg/Kg	1.3	0.1	10	06/26/25 14:16	06/20/25	
Silver	6020B	0.155	mg/Kg	0.053	0.009	10	06/26/25 14:16	06/20/25	
Zinc	6020B	170	mg/Kg	1.3	0.2	10	06/26/25 14:16	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LGC 5
Lab Code: K2506168-005

Service Request: K2506168
Date Collected: 06/12/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	14400	mg/Kg	5.1	1.4	10	06/26/25 14:24	06/20/25	
Arsenic	6020B	4.97	mg/Kg	0.64	0.07	10	06/26/25 14:24	06/20/25	
Cadmium	6020B	0.846	mg/Kg	0.051	0.008	10	06/26/25 14:24	06/20/25	
Copper	6020B	59.6	mg/Kg	0.51	0.17	10	06/26/25 14:24	06/20/25	
Iron	6020B	42000	mg/Kg	10	4	10	06/26/25 14:24	06/20/25	
Lead	6020B	6.21	mg/Kg	0.13	0.02	10	06/26/25 14:24	06/20/25	
Manganese	6020B	777	mg/Kg	0.13	0.06	10	06/26/25 14:24	06/20/25	
Selenium	6020B	1.3	mg/Kg	1.3	0.1	10	06/26/25 14:24	06/20/25	
Silver	6020B	0.156	mg/Kg	0.051	0.009	10	06/26/25 14:24	06/20/25	
Zinc	6020B	165	mg/Kg	1.3	0.2	10	06/26/25 14:24	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: MGC 1
Lab Code: K2506168-006

Service Request: K2506168
Date Collected: 06/10/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	13000	mg/Kg	5.0	1.4	10	06/26/25 14:27	06/20/25	
Arsenic	6020B	4.96	mg/Kg	0.63	0.07	10	06/26/25 14:27	06/20/25	
Cadmium	6020B	0.872	mg/Kg	0.050	0.008	10	06/26/25 14:27	06/20/25	
Copper	6020B	58.0	mg/Kg	0.50	0.16	10	06/26/25 14:27	06/20/25	
Iron	6020B	41000	mg/Kg	10	4	10	06/26/25 14:27	06/20/25	
Lead	6020B	4.60	mg/Kg	0.13	0.02	10	06/26/25 14:27	06/20/25	
Manganese	6020B	732	mg/Kg	0.13	0.06	10	06/26/25 14:27	06/20/25	
Selenium	6020B	1.4	mg/Kg	1.3	0.1	10	06/26/25 14:27	06/20/25	
Silver	6020B	0.164	mg/Kg	0.050	0.009	10	06/26/25 14:27	06/20/25	
Zinc	6020B	164	mg/Kg	1.3	0.2	10	06/26/25 14:27	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: MGC 2
Lab Code: K2506168-007

Service Request: K2506168
Date Collected: 06/10/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11600	mg/Kg	5.0	1.4	10	06/26/25 14:29	06/20/25	
Arsenic	6020B	1.41	mg/Kg	0.63	0.07	10	06/26/25 14:29	06/20/25	
Cadmium	6020B	0.446	mg/Kg	0.050	0.008	10	06/26/25 14:29	06/20/25	
Copper	6020B	53.0	mg/Kg	0.50	0.16	10	06/26/25 14:29	06/20/25	
Iron	6020B	32600	mg/Kg	10	4	10	06/26/25 14:29	06/20/25	
Lead	6020B	13.9	mg/Kg	0.13	0.02	10	06/26/25 14:29	06/20/25	
Manganese	6020B	622	mg/Kg	0.13	0.06	10	06/26/25 14:29	06/20/25	
Selenium	6020B	0.6 J	mg/Kg	1.3	0.1	10	06/26/25 14:29	06/20/25	
Silver	6020B	0.088	mg/Kg	0.050	0.009	10	06/26/25 14:29	06/20/25	
Zinc	6020B	92.7	mg/Kg	1.3	0.2	10	06/26/25 14:29	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: MGC 3
Lab Code: K2506168-008

Service Request: K2506168
Date Collected: 06/10/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12200	mg/Kg	4.4	1.2	10	06/26/25 14:32	06/20/25	
Arsenic	6020B	2.29	mg/Kg	0.55	0.06	10	06/26/25 14:32	06/20/25	
Cadmium	6020B	0.702	mg/Kg	0.044	0.007	10	06/26/25 14:32	06/20/25	
Copper	6020B	78.3	mg/Kg	0.44	0.14	10	06/26/25 14:32	06/20/25	
Iron	6020B	35600	mg/Kg	8.8	3.4	10	06/26/25 14:32	06/20/25	
Lead	6020B	5.30	mg/Kg	0.11	0.02	10	06/26/25 14:32	06/20/25	
Manganese	6020B	737	mg/Kg	0.11	0.05	10	06/26/25 14:32	06/20/25	
Selenium	6020B	0.9 J	mg/Kg	1.1	0.1	10	06/26/25 14:32	06/20/25	
Silver	6020B	0.117	mg/Kg	0.044	0.008	10	06/26/25 14:32	06/20/25	
Zinc	6020B	127	mg/Kg	1.1	0.2	10	06/26/25 14:32	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: MGC 4
Lab Code: K2506168-009

Service Request: K2506168
Date Collected: 06/10/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12800	mg/Kg	4.0	1.1	10	06/26/25 14:34	06/20/25	
Arsenic	6020B	4.41	mg/Kg	0.50	0.05	10	06/26/25 14:34	06/20/25	
Cadmium	6020B	0.799	mg/Kg	0.040	0.006	10	06/26/25 14:34	06/20/25	
Copper	6020B	65.7	mg/Kg	0.40	0.13	10	06/26/25 14:34	06/20/25	
Iron	6020B	40000	mg/Kg	7.9	3.1	10	06/26/25 14:34	06/20/25	
Lead	6020B	12.5	mg/Kg	0.099	0.017	10	06/26/25 14:34	06/20/25	
Manganese	6020B	667	mg/Kg	0.099	0.046	10	06/26/25 14:34	06/20/25	
Selenium	6020B	1.24	mg/Kg	0.99	0.11	10	06/26/25 14:34	06/20/25	
Silver	6020B	0.153	mg/Kg	0.040	0.007	10	06/26/25 14:34	06/20/25	
Zinc	6020B	200	mg/Kg	0.99	0.18	10	06/26/25 14:34	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: MGC 5
Lab Code: K2506168-010

Service Request: K2506168
Date Collected: 06/10/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	13400	mg/Kg	4.0	1.1	10	06/26/25 14:36	06/20/25	
Arsenic	6020B	3.72	mg/Kg	0.50	0.05	10	06/26/25 14:36	06/20/25	
Cadmium	6020B	0.558	mg/Kg	0.040	0.006	10	06/26/25 14:36	06/20/25	
Copper	6020B	62.3	mg/Kg	0.40	0.13	10	06/26/25 14:36	06/20/25	
Iron	6020B	42100	mg/Kg	8.0	3.1	10	06/26/25 14:36	06/20/25	
Lead	6020B	7.27	mg/Kg	0.10	0.02	10	06/26/25 14:36	06/20/25	
Manganese	6020B	669	mg/Kg	0.10	0.05	10	06/26/25 14:36	06/20/25	
Selenium	6020B	1.1	mg/Kg	1.0	0.1	10	06/26/25 14:36	06/20/25	
Silver	6020B	0.145	mg/Kg	0.040	0.007	10	06/26/25 14:36	06/20/25	
Zinc	6020B	138	mg/Kg	1.0	0.2	10	06/26/25 14:36	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: USAR 1
Lab Code: K2506168-011

Service Request: K2506168
Date Collected: 06/11/25 10:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	16000	mg/Kg	7.1	1.9	10	06/26/25 16:07	06/23/25	
Arsenic	6020B	6.17	mg/Kg	0.89	0.09	10	06/24/25 14:37	06/23/25	
Cadmium	6020B	0.833	mg/Kg	0.071	0.012	10	06/24/25 14:37	06/23/25	
Copper	6020B	61.3	mg/Kg	0.71	0.23	10	06/24/25 14:37	06/23/25	
Iron	6020B	41900	mg/Kg	14	5	10	06/26/25 16:07	06/23/25	
Lead	6020B	8.58	mg/Kg	0.53	0.03	10	06/24/25 14:37	06/23/25	
Manganese	6020B	1020	mg/Kg	0.18	0.08	10	06/26/25 16:07	06/23/25	
Selenium	6020B	1.3 J	mg/Kg	1.8	0.2	10	06/24/25 14:37	06/23/25	
Silver	6020B	0.20	mg/Kg	0.18	0.01	10	06/24/25 14:37	06/23/25	
Zinc	6020B	136	mg/Kg	1.8	0.3	10	06/24/25 14:37	06/23/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: USAR 2
Lab Code: K2506168-012

Service Request: K2506168
Date Collected: 06/11/25 10:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11500	mg/Kg	6.5	1.8	10	06/26/25 14:39	06/20/25	
Arsenic	6020B	4.17	mg/Kg	0.82	0.08	10	06/26/25 14:39	06/20/25	
Cadmium	6020B	0.776	mg/Kg	0.065	0.011	10	06/26/25 14:39	06/20/25	
Copper	6020B	42.4	mg/Kg	0.65	0.21	10	06/26/25 14:39	06/20/25	
Iron	6020B	28600	mg/Kg	13	5	10	06/26/25 14:39	06/20/25	
Lead	6020B	5.46	mg/Kg	0.16	0.03	10	06/26/25 14:39	06/20/25	
Manganese	6020B	956	mg/Kg	0.16	0.08	10	06/26/25 14:39	06/20/25	
Selenium	6020B	1.2 J	mg/Kg	1.6	0.2	10	06/26/25 14:39	06/20/25	
Silver	6020B	0.129	mg/Kg	0.065	0.012	10	06/26/25 14:39	06/20/25	
Zinc	6020B	104	mg/Kg	1.6	0.3	10	06/26/25 14:39	06/20/25	

ALS Group USA, Corp.
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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: USAR 3
Lab Code: K2506168-013

Service Request: K2506168
Date Collected: 06/11/25 10:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	14800	mg/Kg	6.3	1.7	10	06/26/25 14:41	06/20/25	
Arsenic	6020B	5.50	mg/Kg	0.79	0.08	10	06/26/25 14:41	06/20/25	
Cadmium	6020B	0.754	mg/Kg	0.063	0.010	10	06/26/25 14:41	06/20/25	
Copper	6020B	51.4	mg/Kg	0.63	0.20	10	06/26/25 14:41	06/20/25	
Iron	6020B	36100	mg/Kg	13	5	10	06/26/25 14:41	06/20/25	
Lead	6020B	6.69	mg/Kg	0.16	0.03	10	06/26/25 14:41	06/20/25	
Manganese	6020B	893	mg/Kg	0.16	0.07	10	06/26/25 14:41	06/20/25	
Selenium	6020B	1.1 J	mg/Kg	1.6	0.2	10	06/26/25 14:41	06/20/25	
Silver	6020B	0.160	mg/Kg	0.063	0.011	10	06/26/25 14:41	06/20/25	
Zinc	6020B	125	mg/Kg	1.6	0.3	10	06/26/25 14:41	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 10:00
Date Received: 06/18/25 09:50

Sample Name: USAR 4
Lab Code: K2506168-014

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	10600	mg/Kg	5.4	1.5	10	06/26/25 14:44	06/20/25	
Arsenic	6020B	3.01	mg/Kg	0.68	0.07	10	06/26/25 14:44	06/20/25	
Cadmium	6020B	0.624	mg/Kg	0.054	0.009	10	06/26/25 14:44	06/20/25	
Copper	6020B	30.3	mg/Kg	0.54	0.18	10	06/26/25 14:44	06/20/25	
Iron	6020B	25300	mg/Kg	11	4	10	06/26/25 14:44	06/20/25	
Lead	6020B	3.39	mg/Kg	0.14	0.02	10	06/26/25 14:44	06/20/25	
Manganese	6020B	685	mg/Kg	0.14	0.06	10	06/26/25 14:44	06/20/25	
Selenium	6020B	0.6 J	mg/Kg	1.4	0.1	10	06/26/25 14:44	06/20/25	
Silver	6020B	0.090	mg/Kg	0.054	0.010	10	06/26/25 14:44	06/20/25	
Zinc	6020B	89.9	mg/Kg	1.4	0.2	10	06/26/25 14:44	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 10:00
Date Received: 06/18/25 09:50

Sample Name: USAR 5
Lab Code: K2506168-015

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	15100	mg/Kg	7.9	2.2	10	06/26/25 14:46	06/20/25	
Arsenic	6020B	5.90	mg/Kg	0.98	0.10	10	06/26/25 14:46	06/20/25	
Cadmium	6020B	0.774	mg/Kg	0.079	0.013	10	06/26/25 14:46	06/20/25	
Copper	6020B	61.5	mg/Kg	0.79	0.26	10	06/26/25 14:46	06/20/25	
Iron	6020B	37400	mg/Kg	16	6	10	06/26/25 14:46	06/20/25	
Lead	6020B	7.72	mg/Kg	0.20	0.03	10	06/26/25 14:46	06/20/25	
Manganese	6020B	926	mg/Kg	0.20	0.09	10	06/26/25 14:46	06/20/25	
Selenium	6020B	1.3 J	mg/Kg	2.0	0.2	10	06/26/25 14:46	06/20/25	
Silver	6020B	0.191	mg/Kg	0.079	0.014	10	06/26/25 14:46	06/20/25	
Zinc	6020B	128	mg/Kg	2.0	0.4	10	06/26/25 14:46	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 13:00
Date Received: 06/18/25 09:50

Sample Name: LSAR 1
Lab Code: K2506168-016

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11700	mg/Kg	4.7	1.3	10	06/26/25 14:54	06/20/25	
Arsenic	6020B	5.32	mg/Kg	0.59	0.06	10	06/26/25 14:54	06/20/25	
Cadmium	6020B	0.652	mg/Kg	0.047	0.008	10	06/26/25 14:54	06/20/25	
Copper	6020B	86.3	mg/Kg	0.47	0.15	10	06/26/25 14:54	06/20/25	
Iron	6020B	41300	mg/Kg	9.4	3.6	10	06/26/25 14:54	06/20/25	
Lead	6020B	8.05	mg/Kg	0.12	0.02	10	06/26/25 14:54	06/20/25	
Manganese	6020B	821	mg/Kg	0.12	0.05	10	06/26/25 14:54	06/20/25	
Selenium	6020B	1.3	mg/Kg	1.2	0.1	10	06/26/25 14:54	06/20/25	
Silver	6020B	0.187	mg/Kg	0.047	0.008	10	06/26/25 14:54	06/20/25	
Zinc	6020B	145	mg/Kg	1.2	0.2	10	06/26/25 14:54	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LSAR 2
Lab Code: K2506168-017

Service Request: K2506168
Date Collected: 06/11/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11300	mg/Kg	4.8	1.3	10	06/26/25 14:57	06/20/25	
Arsenic	6020B	3.44	mg/Kg	0.59	0.06	10	06/26/25 14:57	06/20/25	
Cadmium	6020B	0.490	mg/Kg	0.048	0.008	10	06/26/25 14:57	06/20/25	
Copper	6020B	66.3	mg/Kg	0.48	0.15	10	06/26/25 14:57	06/20/25	
Iron	6020B	37000	mg/Kg	9.5	3.7	10	06/26/25 14:57	06/20/25	
Lead	6020B	5.00	mg/Kg	0.12	0.02	10	06/26/25 14:57	06/20/25	
Manganese	6020B	813	mg/Kg	0.12	0.05	10	06/26/25 14:57	06/20/25	
Selenium	6020B	0.9 J	mg/Kg	1.2	0.1	10	06/26/25 14:57	06/20/25	
Silver	6020B	0.117	mg/Kg	0.048	0.008	10	06/26/25 14:57	06/20/25	
Zinc	6020B	116	mg/Kg	1.2	0.2	10	06/26/25 14:57	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LSAR 3
Lab Code: K2506168-018

Service Request: K2506168
Date Collected: 06/11/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	11900	mg/Kg	5.1	1.4	10	06/26/25 14:59	06/20/25	
Arsenic	6020B	3.65	mg/Kg	0.63	0.07	10	06/26/25 14:59	06/20/25	
Cadmium	6020B	0.448	mg/Kg	0.051	0.008	10	06/26/25 14:59	06/20/25	
Copper	6020B	49.2	mg/Kg	0.51	0.16	10	06/26/25 14:59	06/20/25	
Iron	6020B	37500	mg/Kg	10	4	10	06/26/25 14:59	06/20/25	
Lead	6020B	5.89	mg/Kg	0.13	0.02	10	06/26/25 14:59	06/20/25	
Manganese	6020B	738	mg/Kg	0.13	0.06	10	06/26/25 14:59	06/20/25	
Selenium	6020B	1.0 J	mg/Kg	1.3	0.1	10	06/26/25 14:59	06/20/25	
Silver	6020B	0.119	mg/Kg	0.051	0.009	10	06/26/25 14:59	06/20/25	
Zinc	6020B	115	mg/Kg	1.3	0.2	10	06/26/25 14:59	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 13:00
Date Received: 06/18/25 09:50

Sample Name: LSAR 4
Lab Code: K2506168-019

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12400	mg/Kg	5.5	1.5	10	06/26/25 15:02	06/20/25	
Arsenic	6020B	3.70	mg/Kg	0.69	0.07	10	06/26/25 15:02	06/20/25	
Cadmium	6020B	0.582	mg/Kg	0.055	0.009	10	06/26/25 15:02	06/20/25	
Copper	6020B	36.3	mg/Kg	0.55	0.18	10	06/26/25 15:02	06/20/25	
Iron	6020B	28500	mg/Kg	11	4	10	06/26/25 15:02	06/20/25	
Lead	6020B	4.15	mg/Kg	0.14	0.02	10	06/26/25 15:02	06/20/25	
Manganese	6020B	713	mg/Kg	0.14	0.06	10	06/26/25 15:02	06/20/25	
Selenium	6020B	0.7 J	mg/Kg	1.4	0.2	10	06/26/25 15:02	06/20/25	
Silver	6020B	0.084	mg/Kg	0.055	0.010	10	06/26/25 15:02	06/20/25	
Zinc	6020B	111	mg/Kg	1.4	0.2	10	06/26/25 15:02	06/20/25	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: LSAR 5
Lab Code: K2506168-020

Service Request: K2506168
Date Collected: 06/11/25 13:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12700	mg/Kg	5.2	1.4	10	06/26/25 15:04	06/20/25	
Arsenic	6020B	3.51	mg/Kg	0.65	0.07	10	06/26/25 15:04	06/20/25	
Cadmium	6020B	0.671	mg/Kg	0.052	0.009	10	06/26/25 15:04	06/20/25	
Copper	6020B	38.7	mg/Kg	0.52	0.17	10	06/26/25 15:04	06/20/25	
Iron	6020B	30200	mg/Kg	10	4	10	06/26/25 15:04	06/20/25	
Lead	6020B	4.05	mg/Kg	0.13	0.02	10	06/26/25 15:04	06/20/25	
Manganese	6020B	718	mg/Kg	0.13	0.06	10	06/26/25 15:04	06/20/25	
Selenium	6020B	0.7 J	mg/Kg	1.3	0.1	10	06/26/25 15:04	06/20/25	
Silver	6020B	0.090	mg/Kg	0.052	0.009	10	06/26/25 15:04	06/20/25	
Zinc	6020B	137	mg/Kg	1.3	0.2	10	06/26/25 15:04	06/20/25	

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dba ALS Environmental

Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 15:00
Date Received: 06/18/25 09:50

Sample Name: PLAT 1
Lab Code: K2506168-021

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	9960	mg/Kg	5.2	1.4	10	06/26/25 15:17	06/20/25	
Arsenic	6020B	3.04	mg/Kg	0.65	0.07	10	06/26/25 15:17	06/20/25	
Cadmium	6020B	0.548	mg/Kg	0.052	0.008	10	06/26/25 15:17	06/20/25	
Copper	6020B	21.0	mg/Kg	0.52	0.17	10	06/26/25 15:17	06/20/25	
Iron	6020B	23500	mg/Kg	10	4	10	06/26/25 15:17	06/20/25	
Lead	6020B	5.32	mg/Kg	0.13	0.02	10	06/26/25 15:17	06/20/25	
Manganese	6020B	833	mg/Kg	0.13	0.06	10	06/26/25 15:17	06/20/25	
Selenium	6020B	1.0 J	mg/Kg	1.3	0.1	10	06/26/25 15:17	06/20/25	
Silver	6020B	0.110	mg/Kg	0.052	0.009	10	06/26/25 15:17	06/20/25	
Zinc	6020B	101	mg/Kg	1.3	0.2	10	06/26/25 15:17	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: PLAT 2
Lab Code: K2506168-022

Service Request: K2506168
Date Collected: 06/11/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12300	mg/Kg	10	3	10	06/26/25 15:29	06/20/25	
Arsenic	6020B	3.6	mg/Kg	1.3	0.1	10	06/26/25 15:29	06/20/25	
Cadmium	6020B	0.67	mg/Kg	0.10	0.02	10	06/26/25 15:29	06/20/25	
Copper	6020B	28.3	mg/Kg	1.0	0.3	10	06/26/25 15:29	06/20/25	
Iron	6020B	32200	mg/Kg	20	8	10	06/26/25 15:29	06/20/25	
Lead	6020B	6.55	mg/Kg	0.25	0.04	10	06/26/25 15:29	06/20/25	
Manganese	6020B	1270	mg/Kg	0.25	0.12	10	06/26/25 15:29	06/20/25	
Selenium	6020B	1.2 J	mg/Kg	2.5	0.3	10	06/26/25 15:29	06/20/25	
Silver	6020B	0.18	mg/Kg	0.10	0.02	10	06/26/25 15:29	06/20/25	
Zinc	6020B	125	mg/Kg	2.5	0.5	10	06/26/25 15:29	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 15:00
Date Received: 06/18/25 09:50

Sample Name: PLAT 3
Lab Code: K2506168-023

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	12500	mg/Kg	4.2	1.2	10	06/26/25 15:32	06/20/25	
Arsenic	6020B	2.25	mg/Kg	0.53	0.05	10	06/26/25 15:32	06/20/25	
Cadmium	6020B	0.434	mg/Kg	0.042	0.007	10	06/26/25 15:32	06/20/25	
Copper	6020B	28.8	mg/Kg	0.42	0.14	10	06/26/25 15:32	06/20/25	
Iron	6020B	32400	mg/Kg	8.4	3.3	10	06/26/25 15:32	06/20/25	
Lead	6020B	4.72	mg/Kg	0.11	0.02	10	06/26/25 15:32	06/20/25	
Manganese	6020B	790	mg/Kg	0.11	0.05	10	06/26/25 15:32	06/20/25	
Selenium	6020B	0.4 J	mg/Kg	1.1	0.1	10	06/26/25 15:32	06/20/25	
Silver	6020B	0.059	mg/Kg	0.042	0.007	10	06/26/25 15:32	06/20/25	
Zinc	6020B	129	mg/Kg	1.1	0.2	10	06/26/25 15:32	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25 15:00
Date Received: 06/18/25 09:50

Sample Name: PLAT 4
Lab Code: K2506168-024

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	14000	mg/Kg	5.3	1.5	10	06/26/25 15:34	06/20/25	
Arsenic	6020B	3.03	mg/Kg	0.67	0.07	10	06/26/25 15:34	06/20/25	
Cadmium	6020B	0.491	mg/Kg	0.053	0.009	10	06/26/25 15:34	06/20/25	
Copper	6020B	21.8	mg/Kg	0.53	0.17	10	06/26/25 15:34	06/20/25	
Iron	6020B	36200	mg/Kg	11	4	10	06/26/25 15:34	06/20/25	
Lead	6020B	5.15	mg/Kg	0.13	0.02	10	06/26/25 15:34	06/20/25	
Manganese	6020B	890	mg/Kg	0.13	0.06	10	06/26/25 15:34	06/20/25	
Selenium	6020B	0.3 J	mg/Kg	1.3	0.1	10	06/26/25 15:34	06/20/25	
Silver	6020B	0.061	mg/Kg	0.053	0.009	10	06/26/25 15:34	06/20/25	
Zinc	6020B	128	mg/Kg	1.3	0.2	10	06/26/25 15:34	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: PLAT 5
Lab Code: K2506168-025

Service Request: K2506168
Date Collected: 06/11/25 15:00
Date Received: 06/18/25 09:50

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	14500	mg/Kg	4.4	1.2	10	06/26/25 15:42	06/20/25	
Arsenic	6020B	2.60	mg/Kg	0.55	0.06	10	06/26/25 15:42	06/20/25	
Cadmium	6020B	0.494	mg/Kg	0.044	0.007	10	06/26/25 15:42	06/20/25	
Copper	6020B	33.3	mg/Kg	0.44	0.14	10	06/26/25 15:42	06/20/25	
Iron	6020B	40700	mg/Kg	8.8	3.4	10	06/26/25 15:42	06/20/25	
Lead	6020B	5.31	mg/Kg	0.11	0.02	10	06/26/25 15:42	06/20/25	
Manganese	6020B	762	mg/Kg	0.11	0.05	10	06/26/25 15:42	06/20/25	
Selenium	6020B	0.4 J	mg/Kg	1.1	0.1	10	06/26/25 15:42	06/20/25	
Silver	6020B	0.069	mg/Kg	0.044	0.008	10	06/26/25 15:42	06/20/25	
Zinc	6020B	138	mg/Kg	1.1	0.2	10	06/26/25 15:42	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: Method Blank
Lab Code: KQ2510631-03

Service Request: K2506168
Date Collected: NA
Date Received: NA

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	1.1 J	mg/Kg	4.0	1.1	10	06/26/25 13:54	06/20/25	
Arsenic	6020B	ND U	mg/Kg	0.50	0.05	10	06/26/25 13:54	06/20/25	
Cadmium	6020B	ND U	mg/Kg	0.040	0.007	10	06/26/25 13:54	06/20/25	
Copper	6020B	ND U	mg/Kg	0.40	0.13	10	06/26/25 13:54	06/20/25	
Iron	6020B	ND U	mg/Kg	8.0	3.1	10	06/26/25 13:54	06/20/25	
Lead	6020B	0.03 J	mg/Kg	0.10	0.02	10	06/26/25 13:54	06/20/25	
Manganese	6020B	ND U	mg/Kg	0.10	0.05	10	06/26/25 13:54	06/20/25	
Selenium	6020B	ND U	mg/Kg	1.0	0.1	10	06/26/25 13:54	06/20/25	
Silver	6020B	ND U	mg/Kg	0.040	0.007	10	06/26/25 13:54	06/20/25	
Zinc	6020B	ND U	mg/Kg	1.0	0.2	10	06/26/25 13:54	06/20/25	

ALS Group USA, Corp.
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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: Method Blank
Lab Code: KQ2510655-03

Service Request: K2506168
Date Collected: NA
Date Received: NA

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	ND U	mg/Kg	4.0	1.1	10	06/26/25 15:12	06/20/25	
Arsenic	6020B	ND U	mg/Kg	0.50	0.05	10	06/26/25 15:12	06/20/25	
Cadmium	6020B	ND U	mg/Kg	0.040	0.007	10	06/26/25 15:12	06/20/25	
Copper	6020B	ND U	mg/Kg	0.40	0.13	10	06/26/25 15:12	06/20/25	
Iron	6020B	ND U	mg/Kg	8.0	3.1	10	06/26/25 15:12	06/20/25	
Lead	6020B	0.04 J	mg/Kg	0.10	0.02	10	06/26/25 15:12	06/20/25	
Manganese	6020B	0.05 J	mg/Kg	0.10	0.05	10	06/26/25 15:12	06/20/25	
Selenium	6020B	ND U	mg/Kg	1.0	0.1	10	06/26/25 15:12	06/20/25	
Silver	6020B	ND U	mg/Kg	0.040	0.007	10	06/26/25 15:12	06/20/25	
Zinc	6020B	ND U	mg/Kg	1.0	0.2	10	06/26/25 15:12	06/20/25	

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Analytical Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Sample Name: Method Blank
Lab Code: KQ2510774-03

Service Request: K2506168
Date Collected: NA
Date Received: NA

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020B	2.3 J	mg/Kg	4.0	1.1	10	06/26/25 15:49	06/23/25	
Arsenic	6020B	ND U	mg/Kg	0.50	0.05	10	06/24/25 13:46	06/23/25	
Cadmium	6020B	ND U	mg/Kg	0.040	0.007	10	06/24/25 13:46	06/23/25	
Copper	6020B	ND U	mg/Kg	0.40	0.13	10	06/24/25 13:46	06/23/25	
Iron	6020B	ND U	mg/Kg	8.0	3.1	10	06/26/25 15:49	06/23/25	
Lead	6020B	0.06 J	mg/Kg	0.30	0.02	10	06/24/25 13:46	06/23/25	
Manganese	6020B	0.06 J	mg/Kg	0.10	0.05	10	06/26/25 15:49	06/23/25	
Selenium	6020B	ND U	mg/Kg	1.0	0.1	10	06/24/25 13:46	06/23/25	
Silver	6020B	ND U	mg/Kg	0.10	0.007	10	06/24/25 13:46	06/23/25	
Zinc	6020B	ND U	mg/Kg	1.0	0.2	10	06/24/25 13:46	06/23/25	

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QA/QC Report

Client: Alaska Department of Fish and Game
Project Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/26/25

Replicate Sample Summary

Total Metals

Sample Name: LGC 1
Lab Code: K2506168-001

Units: mg/Kg
Basis: Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2510631-01 Result			
Aluminum	6020B	3.7	1.0	11000	10700	10900	3	20
Arsenic	6020B	0.47	0.05	5.77	5.33	5.55	8	20
Cadmium	6020B	0.037	0.006	0.871	0.730	0.801	18	20
Copper	6020B	0.37	0.12	74.8	78.8	76.8	5	20
Iron	6020B	7.5	2.9	42200	43100	42700	2	20
Lead	6020B	0.093	0.016	7.64	6.91	7.28	10	20
Manganese	6020B	0.093	0.043	824	723	774	13	20
Selenium	6020B	0.93	0.10	1.73	1.80	1.77	4	20
Silver	6020B	0.037	0.007	0.177	0.188	0.183	6	20
Zinc	6020B	0.93	0.17	187	160	174	15	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: Alaska Department of Fish and Game
Project Palmer Project
Sample Matrix: Soil

Service Request: K2506168**Date Collected:** 06/11/25**Date Received:** 06/18/25**Date Analyzed:** 06/26/25**Replicate Sample Summary****Total Metals**

Sample Name: PLAT 1
Lab Code: K2506168-021

Units: mg/Kg**Basis:** Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2510655-01	Average	RPD	RPD Limit
					Result			
Aluminum	6020B	5.2	1.4	9960	12900	11400	25 *	20
Arsenic	6020B	0.65	0.07	3.04	3.51	3.28	15	20
Cadmium	6020B	0.052	0.008	0.548	0.603	0.576	10	20
Copper	6020B	0.52	0.17	21.0	25.8	23.4	21 *	20
Iron	6020B	10	4	23500	33700	28600	35 *	20
Lead	6020B	0.13	0.02	5.32	5.52	5.42	4	20
Manganese	6020B	0.13	0.06	833	960	897	14	20
Selenium	6020B	1.3	0.1	1.0 J	0.5 J	0.8	59 #	20
Silver	6020B	0.052	0.009	0.110	0.073	0.092	41 #	20
Zinc	6020B	1.3	0.2	101	131	116	26 *	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/12/25
Date Received: 06/18/25
Date Analyzed: 06/26/25
Date Extracted: 06/20/25

Matrix Spike Summary
Total Metals

Sample Name: LGC 1
Lab Code: K2506168-001
Analysis Method: 6020B
Prep Method: EPA 3050B

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ2510631-02

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	11000	11400	373	113 #	75-125
Arsenic	5.77	103	93.5	104	75-125
Cadmium	0.871	10.3	9.35	101	75-125
Copper	74.8	129	46.7	115	75-125
Iron	42200	39400	187	-1462 #	75-125
Lead	7.64	102	93.5	101	75-125
Manganese	824	813	93.5	-12 #	75-125
Selenium	1.73	98.7	93.5	104	75-125
Silver	0.177	9.60	9.35	101	75-125
Zinc	187	259	93.5	77	75-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Collected: 06/11/25
Date Received: 06/18/25
Date Analyzed: 06/26/25
Date Extracted: 06/20/25

Matrix Spike Summary
Total Metals

Sample Name: PLAT 1
Lab Code: K2506168-021
Analysis Method: 6020B
Prep Method: EPA 3050B

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ2510655-02

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	9960	12500	526	486 #	75-125
Arsenic	3.04	143	132	106	75-125
Cadmium	0.548	14.1	13.2	103	75-125
Copper	21.0	91.1	65.9	106	75-125
Iron	23500	30600	264	2705 #	75-125
Lead	5.32	142	132	104	75-125
Manganese	833	1300	132	355 #	75-125
Selenium	1.0 J	139	132	105	75-125
Silver	0.110	13.4	13.2	101	75-125
Zinc	101	255	132	117	75-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Analyzed: 06/26/25

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ2510631-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020B	428	400	107	80-120
Arsenic	6020B	109	100	109	80-120
Cadmium	6020B	10.6	10.0	106	80-120
Copper	6020B	53.4	50.0	107	80-120
Iron	6020B	221	200	110	80-120
Lead	6020B	109	100	109	80-120
Manganese	6020B	108	100	108	80-120
Selenium	6020B	110	100	110	80-120
Silver	6020B	10.5	10.0	105	80-120
Zinc	6020B	109	100	109	80-120

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Analyzed: 06/26/25

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ2510655-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020B	414	400	104	80-120
Arsenic	6020B	105	100	105	80-120
Cadmium	6020B	9.92	10.0	99	80-120
Copper	6020B	51.6	50.0	103	80-120
Iron	6020B	215	200	107	80-120
Lead	6020B	102	100	102	80-120
Manganese	6020B	102	100	102	80-120
Selenium	6020B	104	100	104	80-120
Silver	6020B	9.96	10.0	100	80-120
Zinc	6020B	103	100	103	80-120

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request: K2506168
Date Analyzed: 06/24/25 - 06/26/25

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ2510774-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020B	427	400	107	80-120
Arsenic	6020B	106	100	106	80-120
Cadmium	6020B	10.5	10.0	105	80-120
Copper	6020B	53.0	50.0	106	80-120
Iron	6020B	218	200	109	80-120
Lead	6020B	112	100	112	80-120
Manganese	6020B	105	100	105	80-120
Selenium	6020B	106	100	106	80-120
Silver	6020B	10.6	10.0	106	80-120
Zinc	6020B	105	100	105	80-120

ALS Group USA, Corp.
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Prep Summary Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request:K2506168

Metals

Prep Method: EPA 3050B
Analytical Method: 6020B

Extraction Lot: 459261
Extraction Date: 06/20/25 11:46

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
LGC 1	K2506168-001	6/12/25	6/18/25	1.409 g	100 mL	
LGC 2	K2506168-002	6/12/25	6/18/25	1.040 g	100 mL	
LGC 3	K2506168-003	6/12/25	6/18/25	1.149 g	100 mL	
LGC 4	K2506168-004	6/12/25	6/18/25	1.054 g	100 mL	
LGC 5	K2506168-005	6/12/25	6/18/25	1.087 g	100 mL	
MGC 1	K2506168-006	6/10/25	6/18/25	1.091 g	100 mL	
MGC 2	K2506168-007	6/10/25	6/18/25	1.019 g	100 mL	
MGC 3	K2506168-008	6/10/25	6/18/25	1.079 g	100 mL	
MGC 4	K2506168-009	6/10/25	6/18/25	1.342 g	100 mL	
MGC 5	K2506168-010	6/10/25	6/18/25	1.324 g	100 mL	
USAR 2	K2506168-012	6/11/25	6/18/25	1.036 g	100 mL	
USAR 3	K2506168-013	6/11/25	6/18/25	1.233 g	100 mL	
USAR 4	K2506168-014	6/11/25	6/18/25	1.031 g	100 mL	
USAR 5	K2506168-015	6/11/25	6/18/25	1.009 g	100 mL	
LSAR 1	K2506168-016	6/11/25	6/18/25	1.224 g	100 mL	
LSAR 2	K2506168-017	6/11/25	6/18/25	1.240 g	100 mL	
LSAR 3	K2506168-018	6/11/25	6/18/25	1.027 g	100 mL	
LSAR 4	K2506168-019	6/11/25	6/18/25	1.143 g	100 mL	
LSAR 5	K2506168-020	6/11/25	6/18/25	1.142 g	100 mL	
Duplicate	KQ2510631-01DUP	6/12/25	6/18/25	1.422 g	100 mL	
Matrix Spike	KQ2510631-02MS	6/12/25	6/18/25	1.421 g	100 mL	
Method Blank	KQ2510631-03MB	NA	NA	1.0000 g	100 mL	
Lab Control Sample	KQ2510631-04LCS	NA	NA	1.0000 g	100 mL	

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Prep Summary Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request:K2506168

Metals

Prep Method: EPA 3050B
Analytical Method: 6020B

Extraction Lot: 459371
Extraction Date: 06/23/25 11:25

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
USAR 1	K2506168-011	6/11/25	6/18/25	1.049 g	100 mL	
Method Blank	KQ2510774-03MB	NA	NA	1.0000 g	100 mL	
Lab Control Sample	KQ2510774-04LCS	NA	NA	1.0000 g	100 mL	

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Prep Summary Report

Client: Alaska Department of Fish and Game
Project: Palmer Project
Sample Matrix: Soil

Service Request:K2506168

Metals

Prep Method: EPA 3050B
Analytical Method: 6020B

Extraction Lot: 459282
Extraction Date: 06/20/25 11:44

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PLAT 1	K2506168-021	6/11/25	6/18/25	1.160 g	100 mL	
PLAT 2	K2506168-022	6/11/25	6/18/25	1.346 g	100 mL	
PLAT 3	K2506168-023	6/11/25	6/18/25	1.094 g	100 mL	
PLAT 4	K2506168-024	6/11/25	6/18/25	1.130 g	100 mL	
PLAT 5	K2506168-025	6/11/25	6/18/25	1.314 g	100 mL	
Duplicate	KQ2510655-01DUP	6/11/25	6/18/25	1.169 g	100 mL	
Matrix Spike	KQ2510655-02MS	6/11/25	6/18/25	1.145 g	100 mL	
Method Blank	KQ2510655-03MB	NA	NA	1.0000 g	100 mL	
Lab Control Sample	KQ2510655-04LCS	NA	NA	1.0000 g	100 mL	

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
ICV 06/24/25 09:20							
	Arsenic	6020B	883767	25.1	25.0	100	90-110
	Cadmium	6020B	883767	11.9	12.5	95	90-110
	Copper	6020B	883767	11.8	12.5	94	90-110
	Lead	6020B	883767	24.0	25.0	96	90-110
	Selenium	6020B	883767	25.0	25.0	100	90-110
	Silver	6020B	883767	11.9	12.5	95	90-110
	Zinc	6020B	883767	24.1	25.0	97	90-110
CCV 06/24/25 09:23							
	Arsenic	6020B	883767	25.3	25.0	101	90-110
	Cadmium	6020B	883767	24.9	25.0	100	90-110
	Copper	6020B	883767	25.6	25.0	103	90-110
	Lead	6020B	883767	24.9	25.0	99	90-110
	Selenium	6020B	883767	25.4	25.0	102	90-110
	Silver	6020B	883767	12.5	12.5	100	90-110
	Zinc	6020B	883767	25.4	25.0	102	90-110
CCV 06/24/25 10:52							
	Arsenic	6020B	883767	25.2	25.0	101	90-110
	Cadmium	6020B	883767	24.9	25.0	100	90-110
	Copper	6020B	883767	25.5	25.0	102	90-110
	Lead	6020B	883767	24.9	25.0	99	90-110
	Selenium	6020B	883767	24.9	25.0	100	90-110
	Silver	6020B	883767	12.5	12.5	100	90-110
	Zinc	6020B	883767	25.3	25.0	101	90-110
CCV 06/24/25 11:26							
	Arsenic	6020B	883767	24.6	25.0	98	90-110
	Cadmium	6020B	883767	25.3	25.0	101	90-110
	Copper	6020B	883767	26.1	25.0	104	90-110
	Lead	6020B	883767	26.4	25.0	105	90-110
	Selenium	6020B	883767	24.6	25.0	98	90-110
	Silver	6020B	883767	12.8	12.5	102	90-110
	Zinc	6020B	883767	25.8	25.0	103	90-110
CCV 06/24/25 11:59							
	Arsenic	6020B	883767	24.6	25.0	98	90-110
	Cadmium	6020B	883767	24.7	25.0	99	90-110
	Copper	6020B	883767	26.3	25.0	105	90-110
	Lead	6020B	883767	26.1	25.0	104	90-110

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
CCV 06/24/25 11:59	Selenium	6020B	883767	24.7	25.0	99	90-110
	Silver	6020B	883767	12.7	12.5	102	90-110
	Zinc	6020B	883767	25.6	25.0	102	90-110
CCV 06/24/25 12:44	Arsenic	6020B	883767	25.0	25.0	100	90-110
	Cadmium	6020B	883767	24.8	25.0	99	90-110
	Copper	6020B	883767	25.8	25.0	103	90-110
	Lead	6020B	883767	25.7	25.0	103	90-110
	Selenium	6020B	883767	24.2	25.0	97	90-110
	Silver	6020B	883767	12.7	12.5	101	90-110
	Zinc	6020B	883767	25.5	25.0	102	90-110
CCV 06/24/25 13:41	Arsenic	6020B	883767	24.8	25.0	99	90-110
	Cadmium	6020B	883767	24.6	25.0	98	90-110
	Copper	6020B	883767	25.7	25.0	103	90-110
	Lead	6020B	883767	25.4	25.0	102	90-110
	Selenium	6020B	883767	24.7	25.0	99	90-110
	Silver	6020B	883767	12.5	12.5	100	90-110
	Zinc	6020B	883767	25.4	25.0	102	90-110
CCV 06/24/25 14:15	Arsenic	6020B	883767	25.0	25.0	100	90-110
	Cadmium	6020B	883767	24.8	25.0	99	90-110
	Copper	6020B	883767	25.7	25.0	103	90-110
	Lead	6020B	883767	25.1	25.0	101	90-110
	Selenium	6020B	883767	24.7	25.0	99	90-110
	Silver	6020B	883767	12.5	12.5	100	90-110
	Zinc	6020B	883767	25.6	25.0	102	90-110
CCV 06/24/25 14:46	Arsenic	6020B	883767	25.0	25.0	100	90-110
	Cadmium	6020B	883767	24.4	25.0	97	90-110
	Copper	6020B	883767	25.4	25.0	102	90-110
	Lead	6020B	883767	24.9	25.0	100	90-110
	Selenium	6020B	883767	24.2	25.0	97	90-110
	Silver	6020B	883767	12.4	12.5	99	90-110
	Zinc	6020B	883767	25.3	25.0	101	90-110

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
ICV 06/26/25 13:09	Aluminum	6020B	884174	102	100	102	90-110
	Arsenic	6020B	884174	25.7	25.0	103	90-110
	Cadmium	6020B	884174	12.3	12.5	99	90-110
	Copper	6020B	884174	12.2	12.5	97	90-110
	Iron	6020B	884174	49.7	50.0	99	90-110
	Lead	6020B	884174	23.6	25.0	94	90-110
	Manganese	6020B	884174	24.4	25.0	98	90-110
	Selenium	6020B	884174	25.1	25.0	100	90-110
	Silver	6020B	884174	12.2	12.5	97	90-110
	Zinc	6020B	884174	24.8	25.0	99	90-110
CCV 06/26/25 13:12	Aluminum	6020B	884174	258	250	103	90-110
	Arsenic	6020B	884174	25.7	25.0	103	90-110
	Cadmium	6020B	884174	24.8	25.0	99	90-110
	Copper	6020B	884174	25.6	25.0	102	90-110
	Iron	6020B	884174	255	250	102	90-110
	Lead	6020B	884174	24.5	25.0	98	90-110
	Manganese	6020B	884174	25.3	25.0	101	90-110
	Selenium	6020B	884174	25.6	25.0	102	90-110
	Silver	6020B	884174	12.3	12.5	98	90-110
	Zinc	6020B	884174	25.9	25.0	104	90-110
CCV 06/26/25 14:19	Aluminum	6020B	884174	263	250	105	90-110
	Arsenic	6020B	884174	25.6	25.0	103	90-110
	Cadmium	6020B	884174	25.5	25.0	102	90-110
	Copper	6020B	884174	25.9	25.0	104	90-110
	Iron	6020B	884174	266	250	107	90-110
	Lead	6020B	884174	24.3	25.0	97	90-110
	Manganese	6020B	884174	25.8	25.0	103	90-110
	Selenium	6020B	884174	25.3	25.0	101	90-110
	Silver	6020B	884174	12.6	12.5	101	90-110
	Zinc	6020B	884174	26.3	25.0	105	90-110
CCV 06/26/25 14:49	Aluminum	6020B	884174	266	250	106	90-110
	Arsenic	6020B	884174	25.7	25.0	103	90-110
	Cadmium	6020B	884174	24.9	25.0	99	90-110

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
CCV 06/26/25 14:49	Copper	6020B	884174	25.7	25.0	103	90-110
	Iron	6020B	884174	261	250	104	90-110
	Lead	6020B	884174	24.2	25.0	97	90-110
	Manganese	6020B	884174	25.6	25.0	102	90-110
	Selenium	6020B	884174	25.0	25.0	100	90-110
	Silver	6020B	884174	12.4	12.5	99	90-110
	Zinc	6020B	884174	26.0	25.0	104	90-110
CCV 06/26/25 15:07	Aluminum	6020B	884174	269	250	108	90-110
	Arsenic	6020B	884174	25.6	25.0	102	90-110
	Cadmium	6020B	884174	25.0	25.0	100	90-110
	Copper	6020B	884174	25.9	25.0	104	90-110
	Iron	6020B	884174	264	250	106	90-110
	Lead	6020B	884174	24.2	25.0	97	90-110
	Manganese	6020B	884174	25.5	25.0	102	90-110
	Selenium	6020B	884174	24.9	25.0	100	90-110
	Silver	6020B	884174	12.5	12.5	100	90-110
	Zinc	6020B	884174	26.0	25.0	104	90-110
CCV 06/26/25 15:37	Aluminum	6020B	884174	260	250	104	90-110
	Arsenic	6020B	884174	25.8	25.0	103	90-110
	Cadmium	6020B	884174	24.8	25.0	99	90-110
	Copper	6020B	884174	25.9	25.0	104	90-110
	Iron	6020B	884174	263	250	105	90-110
	Lead	6020B	884174	24.1	25.0	97	90-110
	Manganese	6020B	884174	25.7	25.0	103	90-110
	Selenium	6020B	884174	25.0	25.0	100	90-110
	Silver	6020B	884174	12.4	12.5	99	90-110
	Zinc	6020B	884174	25.8	25.0	103	90-110
CCV 06/26/25 15:44	Aluminum	6020B	884174	260	250	104	90-110
	Arsenic	6020B	884174	25.8	25.0	103	90-110
	Cadmium	6020B	884174	24.7	25.0	99	90-110
	Copper	6020B	884174	25.6	25.0	102	90-110
	Iron	6020B	884174	267	250	107	90-110
	Lead	6020B	884174	23.8	25.0	95	90-110

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID		Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
Analyte							
CCV 06/26/25 15:44	Manganese	6020B	884174	25.5	25.0	102	90-110
	Selenium	6020B	884174	25.0	25.0	100	90-110
	Silver	6020B	884174	12.4	12.5	99	90-110
	Zinc	6020B	884174	25.7	25.0	103	90-110
CCV 06/26/25 16:09	Aluminum	6020B	884174	258	250	103	90-110
	Arsenic	6020B	884174	25.9	25.0	103	90-110
	Cadmium	6020B	884174	24.9	25.0	100	90-110
	Copper	6020B	884174	26.2	25.0	105	90-110
	Iron	6020B	884174	263	250	105	90-110
	Lead	6020B	884174	24.1	25.0	96	90-110
	Manganese	6020B	884174	25.7	25.0	103	90-110
	Selenium	6020B	884174	25.0	25.0	100	90-110
	Silver	6020B	884174	12.3	12.5	99	90-110
	Zinc	6020B	884174	25.8	25.0	103	90-110

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

Analyte	Method	Analysis Batch:	Result	C
ICB 06/24/25 09:26				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.05	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	U
CCB 06/24/25 09:28				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.03	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	U
CCB 06/24/25 10:55				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	-0.0304	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	U
CCB 06/24/25 11:36				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.18	J
Lead	6020B	883767	0.15	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	J
CCB 06/24/25 12:10				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.011	J
Copper	6020B	883767	0.21	J
Lead	6020B	883767	0.21	J

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

Analyte	Method	Analysis Batch:	Result	C
CCB 06/24/25 12:10				
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.09	J
Zinc	6020B	883767	0.2	U
CCB 06/24/25 12:47				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.08	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.05	J
Zinc	6020B	883767	0.2	U
CCB 06/24/25 13:44				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.02	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.008	J
Zinc	6020B	883767	0.2	U
CCB 06/24/25 14:17				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.03	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	U
CCB 06/24/25 14:49				
Arsenic	6020B	883767	0.05	U
Cadmium	6020B	883767	0.007	U
Copper	6020B	883767	0.13	U
Lead	6020B	883767	0.03	J
Selenium	6020B	883767	0.1	U
Silver	6020B	883767	0.007	U
Zinc	6020B	883767	0.2	U

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

Analyte	Method	Analysis Batch:	Result	C
ICB 06/26/25 13:15				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 13:17				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 14:21				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 14:51				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

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INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

Analyte	Method	Analysis Batch:	Result	C
CCB 06/26/25 14:51				
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 15:09				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 15:39				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U
Manganese	6020B	884174	0.05	U
Selenium	6020B	884174	0.1	U
Silver	6020B	884174	0.007	U
Zinc	6020B	884174	0.2	U
CCB 06/26/25 15:47				
Aluminum	6020B	884174	1.1	U
Arsenic	6020B	884174	0.05	U
Cadmium	6020B	884174	0.007	U
Copper	6020B	884174	0.13	U
Iron	6020B	884174	3.1	U
Lead	6020B	884174	0.02	U

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

Analyte		Method	Analysis Batch:	Result	C
CCB	06/26/25 15:47				
	Manganese	6020B	884174	0.06	J
	Selenium	6020B	884174	0.1	U
	Silver	6020B	884174	0.007	U
	Zinc	6020B	884174	0.2	U
CCB	06/26/25 16:12				
	Aluminum	6020B	884174	1.1	U
	Arsenic	6020B	884174	0.05	U
	Cadmium	6020B	884174	0.007	U
	Copper	6020B	884174	0.13	U
	Iron	6020B	884174	3.1	U
	Lead	6020B	884174	0.02	U
	Manganese	6020B	884174	0.05	J
	Selenium	6020B	884174	0.1	U
	Silver	6020B	884174	0.007	U
	Zinc	6020B	884174	0.2	U

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits	Analysis Date
LLICVS								
	Arsenic	6020B	883767	0.53	0.5	105	80-120	06/24/25 09:31
	Cadmium	6020B	883767	0.039	0.04	98	80-120	06/24/25 09:31
	Copper	6020B	883767	0.43	0.4	108	80-120	06/24/25 09:31
	Lead	6020B	883767	0.10	0.1	103	80-120	06/24/25 09:31
	Selenium	6020B	883767	0.99	1.0	99	80-120	06/24/25 09:31
	Silver	6020B	883767	0.041	0.04	103	80-120	06/24/25 09:31
	Zinc	6020B	883767	1.1	1.0	114	80-120	06/24/25 09:31
LLICVS								
	Aluminum	6020B	884174	4.1	4.0	102	80-120	06/26/25 13:20
	Arsenic	6020B	884174	0.54	0.5	107	80-120	06/26/25 13:20
	Cadmium	6020B	884174	0.045	0.04	111	80-120	06/26/25 13:20
	Copper	6020B	884174	0.41	0.4	102	80-120	06/26/25 13:20
	Iron	6020B	884174	7.9	8.0	99	80-120	06/26/25 13:20
	Lead	6020B	884174	0.097	0.1	97	80-120	06/26/25 13:20
	Manganese	6020B	884174	0.10	0.1	100	80-120	06/26/25 13:20
	Selenium	6020B	884174	1.0	1.0	101	80-120	06/26/25 13:20
	Silver	6020B	884174	0.040	0.04	101	80-120	06/26/25 13:20
	Zinc	6020B	884174	1.1	1.0	107	80-120	06/26/25 13:20

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec.	Analysis Date
						Limits	
Arsenic	6020B	883767	0.08	-	-	-	06/24/25 09:34
Cadmium	6020B	883767	0.408	-	-	-	06/24/25 09:34
Copper	6020B	883767	0.74	-	-	-	06/24/25 09:34
Lead	6020B	883767	0.31	-	-	-	06/24/25 09:34
Selenium	6020B	883767	0.03	-	-	-	06/24/25 09:34
Silver	6020B	883767	0.01	-	-	-	06/24/25 09:34
Zinc	6020B	883767	0.6	-	-	-	06/24/25 09:34

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec.	Analysis Date
						Limits	
Arsenic	6020B	883767	25.7	25.0	103	80-120	06/24/25 09:37
Cadmium	6020B	883767	25.5	25.0	102	80-120	06/24/25 09:37
Copper	6020B	883767	49.0	50.0	98	80-120	06/24/25 09:37
Lead	6020B	883767	0.38	-	-	-	06/24/25 09:37
Selenium	6020B	883767	24.5	25.0	98	80-120	06/24/25 09:37
Silver	6020B	883767	12.5	12.5	100	80-120	06/24/25 09:37
Zinc	6020B	883767	24.8	25.0	99	80-120	06/24/25 09:37

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec.	Analysis Date
						Limits	
Aluminum	6020B	884174	21000	-	-	-	06/26/25 13:22
Arsenic	6020B	884174	0.10	-	-	-	06/26/25 13:22
Cadmium	6020B	884174	0.415	-	-	-	06/26/25 13:22
Copper	6020B	884174	0.70	-	-	-	06/26/25 13:22
Iron	6020B	884174	49400	-	-	-	06/26/25 13:22
Lead	6020B	884174	0.24	-	-	-	06/26/25 13:22
Manganese	6020B	884174	0.80	-	-	-	06/26/25 13:22
Selenium	6020B	884174	0.03	-	-	-	06/26/25 13:22
Silver	6020B	884174	0.010	-	-	-	06/26/25 13:22
Zinc	6020B	884174	0.7	-	-	-	06/26/25 13:22

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits	Analysis Date
Aluminum	6020B	884174	20700	-	-	-	06/26/25 13:25
Arsenic	6020B	884174	26.6	25.0	107	80-120	06/26/25 13:25
Cadmium	6020B	884174	25.4	25.0	102	80-120	06/26/25 13:25
Copper	6020B	884174	49.6	50.0	99	80-120	06/26/25 13:25
Iron	6020B	884174	49600	-	-	-	06/26/25 13:25
Lead	6020B	884174	0.25	-	-	-	06/26/25 13:25
Manganese	6020B	884174	52.6	50.0	105	80-120	06/26/25 13:25
Selenium	6020B	884174	25.6	25.0	102	80-120	06/26/25 13:25
Silver	6020B	884174	12.5	12.5	100	80-120	06/26/25 13:25
Zinc	6020B	884174	25.3	25.0	101	80-120	06/26/25 13:25

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QA/QC Report

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Project: Palmer Project

Service Request: K2506168

POST SPIKE SAMPLE RECOVERY

Concentration Units: ug/L

Sample ID	Analyte	Method	Analysis Batch:	Initial Sample Result	Post Spike Result	True Value	% Rec	% Rec. Limits	Analysis Date
K2506168-001A									
	Aluminum	6020B	884174	11600	12100	50	905 #	75-125	06/26/25 14:07
	Arsenic	6020B	884174	6.1	59.3	50.0	106	75-125	06/26/25 14:07
	Cadmium	6020B	884174	0.92	53.3	50.0	105	75-125	06/26/25 14:07
	Copper	6020B	884174	79.3	132	50.0	105	75-125	06/26/25 14:07
	Iron	6020B	884174	44700	44700	50	-104 #	75-125	06/26/25 14:07
	Lead	6020B	884174	8.1	59.8	50.0	103	75-125	06/26/25 14:07
	Manganese	6020B	884174	874	920	50.0	91 #	75-125	06/26/25 14:07
	Selenium	6020B	884174	2	55	50	106	75-125	06/26/25 14:07
	Silver	6020B	884174	0.19	10.8	10.0	106	75-125	06/26/25 14:07
	Zinc	6020B	884174	198	250	50	104	75-125	06/26/25 14:07
K2506168-021A									
	Aluminum	6020B	884174	7660	7780	50	240 #	75-125	06/26/25 15:24
	Arsenic	6020B	884174	2.3	55.4	50.0	106	75-125	06/26/25 15:24
	Cadmium	6020B	884174	0.42	51.0	50.0	101	75-125	06/26/25 15:24
	Copper	6020B	884174	16.1	68.8	50.0	105	75-125	06/26/25 15:24
	Iron	6020B	884174	18000	18000	50	-68 #	75-125	06/26/25 15:24
	Lead	6020B	884174	4.1	55.3	50.0	102	75-125	06/26/25 15:24
	Manganese	6020B	884174	641	689	50.0	96 #	75-125	06/26/25 15:24
	Selenium	6020B	884174	0.8 J	54	50	106	75-125	06/26/25 15:24
	Silver	6020B	884174	0.08	10.3	10.0	102	75-125	06/26/25 15:24
	Zinc	6020B	884174	77	128	50	102	75-125	06/26/25 15:24

Results flagged with a pound (#) indicate the control criteria is not applicable.

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project

Service Request: K2506168

ICP SERIAL DILUTIONS

Concentration Units: ug/L

Sample ID			Initial Sample Result	Serial Dilution Result	% Diff	% Diff. Limit	Analysis Date
Analyte	Method	Analysis Batch:					
K2506168-001SDL							
Aluminum	6020B	884174	116000	119000	2	10	06/26/25 14:04
Arsenic	6020B	884174	61	61	0	10	06/26/25 14:04
Cadmium	6020B	884174	9.2	9.4	1	10	06/26/25 14:04
Copper	6020B	884174	793	809	2	10	06/26/25 14:04
Iron	6020B	884174	447000	443000	1	10	06/26/25 14:04
Lead	6020B	884174	81.0	84.5	4	10	06/26/25 14:04
Manganese	6020B	884174	8740	8400	4	10	06/26/25 14:04
Selenium	6020B	884174	18	19 J	5	10	06/26/25 14:04
Silver	6020B	884174	1.9	2.2	17	10	06/26/25 14:04
Zinc	6020B	884174	1980	1990	0	10	06/26/25 14:04
K2506168-021SDL							
Aluminum	6020B	884174	76600	77700	1	10	06/26/25 15:22
Arsenic	6020B	884174	23	23 J	2	10	06/26/25 15:22
Cadmium	6020B	884174	4.2	4.1	2	10	06/26/25 15:22
Copper	6020B	884174	161	161	0	10	06/26/25 15:22
Iron	6020B	884174	180000	185000	2	10	06/26/25 15:22
Lead	6020B	884174	40.9	40.2	2	10	06/26/25 15:22
Manganese	6020B	884174	6410	6240	3	10	06/26/25 15:22
Selenium	6020B	884174	8	8 J	1	10	06/26/25 15:22
Silver	6020B	884174	0.8	0.8 J	9	10	06/26/25 15:22
Zinc	6020B	884174	773	790	2	10	06/26/25 15:22

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Detection Limits

Instrument: K-ICP-MS-05

Matrix: Soil

Analyte	Mass	Units	MRL	MDL	Method
Aluminum	27	ug/L	4	1.1	6020B
Arsenic	75	ug/L	0.5	0.052	6020B
Cadmium	111	ug/L	0.04	0.0065	6020B
Copper	65	ug/L	0.4	0.13	6020B
Iron	56	ug/L	8	3.1	6020B
Lead	208	ug/L	0.1	0.017	6020B
Manganese	55	ug/L	0.1	0.046	6020B
Selenium	78	ug/L	1	0.11	6020B
Silver	107	ug/L	0.04	0.0071	6020B
Zinc	66	ug/L	1	0.18	6020B

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

ICP Linear Range (Quarterly)

Instrument: K-ICP-MS-05

Analyte	Concentration (ug/L)	Method
Aluminum 27	45000	6020B
Arsenic 75	3600	6020B
Cadmium 111	3600	6020B
Copper 65	9000	6020B
Iron 56	90000	6020B
Lead 208	3600	6020B
Manganese 55	3600	6020B
Selenium 78	3600	6020B
Silver 107	180	6020B
Zinc 66	9000	6020B

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Dilution Factor	Date/Time	A s	C d	C u	P b	S e	A g	Z n
ZZZZZZ	1	06/24/25 09:14							
ZZZZZZ	1	06/24/25 09:17							
ICV	1	06/24/25 09:20	X	X	X	X	X	X	X
CCV	1	06/24/25 09:23	X	X	X	X	X	X	X
ICB	1	06/24/25 09:26	X	X	X	X	X	X	X
CCB	1	06/24/25 09:28	X	X	X	X	X	X	X
LLICVS	1	06/24/25 09:31	X	X	X	X	X	X	X
ICSA	1	06/24/25 09:34	X	X	X	X	X	X	X
ICSAB	1	06/24/25 09:37	X	X	X	X	X	X	X
ZZZZZZ	1	06/24/25 09:40							
ZZZZZZ	1	06/24/25 09:47							
ZZZZZZ	1	06/24/25 09:53							
ZZZZZZ	10	06/24/25 10:32							
ZZZZZZ	10	06/24/25 10:35							
ZZZZZZ	10	06/24/25 10:38							
ZZZZZZ	10	06/24/25 10:40							
ZZZZZZ	50	06/24/25 10:43							
ZZZZZZ	10	06/24/25 10:46							
ZZZZZZ	10	06/24/25 10:49							
CCV	1	06/24/25 10:52	X	X	X	X	X	X	X
CCB	1	06/24/25 10:55	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 10:58							
ZZZZZZ	10	06/24/25 11:01							
ZZZZZZ	10	06/24/25 11:03							
ZZZZZZ	10	06/24/25 11:06							
ZZZZZZ	50	06/24/25 11:09							
ZZZZZZ	10	06/24/25 11:12							
ZZZZZZ	10	06/24/25 11:15							
ZZZZZZ	10	06/24/25 11:17							
ZZZZZZ	10	06/24/25 11:20							
ZZZZZZ	10	06/24/25 11:23							
CCV	1	06/24/25 11:26	X	X	X	X	X	X	X
ZZZZZZ	1	06/24/25 11:29							
CCB	1	06/24/25 11:36	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 11:40							
ZZZZZZ	10	06/24/25 11:43							
ZZZZZZ	10	06/24/25 11:45							

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Dilution Factor	Date/Time	A s	C d	C u	P b	S e	A g	Z n
ZZZZZZ	10	06/24/25 11:48							
ZZZZZZ	10	06/24/25 11:51							
ZZZZZZ	10	06/24/25 11:54							
ZZZZZZ	10	06/24/25 11:56							
CCV	1	06/24/25 11:59	X	X	X	X	X	X	X
ZZZZZZ	1	06/24/25 12:02							
CCB	1	06/24/25 12:10	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 12:16							
ZZZZZZ	10	06/24/25 12:19							
ZZZZZZ	10	06/24/25 12:22							
ZZZZZZ	10	06/24/25 12:24							
ZZZZZZ	50	06/24/25 12:27							
ZZZZZZ	10	06/24/25 12:30							
ZZZZZZ	10	06/24/25 12:33							
ZZZZZZ	10	06/24/25 12:35							
ZZZZZZ	10	06/24/25 12:38							
ZZZZZZ	10	06/24/25 12:41							
CCV	1	06/24/25 12:44	X	X	X	X	X	X	X
CCB	1	06/24/25 12:47	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 12:50							
ZZZZZZ	50	06/24/25 13:09							
ZZZZZZ	50	06/24/25 13:12							
ZZZZZZ	250	06/24/25 13:14							
ZZZZZZ	50	06/24/25 13:17							
ZZZZZZ	50	06/24/25 13:20							
ZZZZZZ	100	06/24/25 13:23							
ZZZZZZ	100	06/24/25 13:26							
ZZZZZZ	1000	06/24/25 13:28							
ZZZZZZ	50	06/24/25 13:31							
CCV	1	06/24/25 13:41	X	X	X	X	X	X	X
CCB	1	06/24/25 13:44	X	X	X	X	X	X	X
KQ2510774-03MB	10	06/24/25 13:46	X	X	X	X	X	X	X
KQ2510774-04LCS	10	06/24/25 13:49	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 13:52							
ZZZZZZ	10	06/24/25 13:55							
ZZZZZZ	50	06/24/25 13:58							
ZZZZZZ	10	06/24/25 14:01							

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Dilution Factor	Date/Time	A s	C d	C u	P b	S e	A g	Z n
ZZZZZZ	10	06/24/25 14:03							
ZZZZZZ	10	06/24/25 14:06							
ZZZZZZ	10	06/24/25 14:09							
ZZZZZZ	10	06/24/25 14:12							
CCV	1	06/24/25 14:15	X	X	X	X	X	X	X
CCB	1	06/24/25 14:17	X	X	X	X	X	X	X
ZZZZZZ	10	06/24/25 14:20							
ZZZZZZ	10	06/24/25 14:23							
ZZZZZZ	10	06/24/25 14:26							
ZZZZZZ	10	06/24/25 14:29							
ZZZZZZ	10	06/24/25 14:31							
ZZZZZZ	10	06/24/25 14:34							
K2506168-011	10	06/24/25 14:37	X	X	X	X	X	X	X
ZZZZZZ	1000	06/24/25 14:40							
ZZZZZZ	100	06/24/25 14:43							
CCV	1	06/24/25 14:46	X	X	X	X	X	X	X
CCB	1	06/24/25 14:49	X	X	X	X	X	X	X

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 884174

Sample	Dilution Factor	Date/Time	Al	As	Cd	Cu	Fe	Pb	Mn	Se	Ag	Zn
ZZZZZZ	1	06/26/25 13:04										
ZZZZZZ	1	06/26/25 13:07										
ICV	1	06/26/25 13:09	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 13:12	X	X	X	X	X	X	X	X	X	X
ICB	1	06/26/25 13:15	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 13:17	X	X	X	X	X	X	X	X	X	X
LLICVS	1	06/26/25 13:20	X	X	X	X	X	X	X	X	X	X
ICSA	1	06/26/25 13:22	X	X	X	X	X	X	X	X	X	X
ICSAB	1	06/26/25 13:25	X	X	X	X	X	X	X	X	X	X
ZZZZZZ	1	06/26/25 13:27										
ZZZZZZ	1	06/26/25 13:34										
ZZZZZZ	1	06/26/25 13:37										
ZZZZZZ	1	06/26/25 13:41										
KQ2510631-03MB	10	06/26/25 13:54	X	X	X	X	X	X	X	X	X	X
KQ2510631-04LCS	10	06/26/25 13:57	X	X	X	X	X	X	X	X	X	X
K2506168-001	10	06/26/25 13:59	X	X	X	X	X	X	X	X	X	X
K2506168-001DUP	10	06/26/25 14:02	X	X	X	X	X	X	X	X	X	X
K2506168-001SDL	50	06/26/25 14:04	X	X	X	X	X	X	X	X	X	X
K2506168-001PS	10	06/26/25 14:07	X	X	X	X	X	X	X	X	X	X
K2506168-001MS	10	06/26/25 14:09	X	X	X	X	X	X	X	X	X	X
K2506168-002	10	06/26/25 14:11	X	X	X	X	X	X	X	X	X	X
K2506168-003	10	06/26/25 14:14	X	X	X	X	X	X	X	X	X	X
K2506168-004	10	06/26/25 14:16	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 14:19	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 14:21	X	X	X	X	X	X	X	X	X	X
K2506168-005	10	06/26/25 14:24	X	X	X	X	X	X	X	X	X	X
K2506168-006	10	06/26/25 14:27	X	X	X	X	X	X	X	X	X	X
K2506168-007	10	06/26/25 14:29	X	X	X	X	X	X	X	X	X	X
K2506168-008	10	06/26/25 14:32	X	X	X	X	X	X	X	X	X	X
K2506168-009	10	06/26/25 14:34	X	X	X	X	X	X	X	X	X	X
K2506168-010	10	06/26/25 14:36	X	X	X	X	X	X	X	X	X	X
K2506168-012	10	06/26/25 14:39	X	X	X	X	X	X	X	X	X	X
K2506168-013	10	06/26/25 14:41	X	X	X	X	X	X	X	X	X	X
K2506168-014	10	06/26/25 14:44	X	X	X	X	X	X	X	X	X	X
K2506168-015	10	06/26/25 14:46	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 14:49	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 14:51	X	X	X	X	X	X	X	X	X	X

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 884174

Sample	Dilution Factor	Date/Time	Al	As	Cd	Cu	Fe	Pb	Mn	Se	Ag	Zn
K2506168-016	10	06/26/25 14:54	X	X	X	X	X	X	X	X	X	X
K2506168-017	10	06/26/25 14:57	X	X	X	X	X	X	X	X	X	X
K2506168-018	10	06/26/25 14:59	X	X	X	X	X	X	X	X	X	X
K2506168-019	10	06/26/25 15:02	X	X	X	X	X	X	X	X	X	X
K2506168-020	10	06/26/25 15:04	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 15:07	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 15:09	X	X	X	X	X	X	X	X	X	X
KQ2510655-03MB	10	06/26/25 15:12	X	X	X	X	X	X	X	X	X	X
KQ2510655-04LCS	10	06/26/25 15:14	X	X	X	X	X	X	X	X	X	X
K2506168-021	10	06/26/25 15:17	X	X	X	X	X	X	X	X	X	X
K2506168-021DUP	10	06/26/25 15:19	X	X	X	X	X	X	X	X	X	X
K2506168-021SDL	50	06/26/25 15:22	X	X	X	X	X	X	X	X	X	X
K2506168-021PS	10	06/26/25 15:24	X	X	X	X	X	X	X	X	X	X
K2506168-021MS	10	06/26/25 15:27	X	X	X	X	X	X	X	X	X	X
K2506168-022	10	06/26/25 15:29	X	X	X	X	X	X	X	X	X	X
K2506168-023	10	06/26/25 15:32	X	X	X	X	X	X	X	X	X	X
K2506168-024	10	06/26/25 15:34	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 15:37	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 15:39	X	X	X	X	X	X	X	X	X	X
K2506168-025	10	06/26/25 15:42	X	X	X	X	X	X	X	X	X	X
CCV	1	06/26/25 15:44	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 15:47	X	X	X	X	X	X	X	X	X	X
KQ2510774-03MB	10	06/26/25 15:49	X				X		X			
KQ2510774-04LCS	10	06/26/25 15:52	X	X	X	X	X	X	X	X	X	X
ZZZZZZ	10	06/26/25 15:54										
ZZZZZZ	10	06/26/25 15:57										
ZZZZZZ	50	06/26/25 15:59										
ZZZZZZ	10	06/26/25 16:02										
ZZZZZZ	10	06/26/25 16:04										
K2506168-011	10	06/26/25 16:07	X				X		X			
CCV	1	06/26/25 16:09	X	X	X	X	X	X	X	X	X	X
CCB	1	06/26/25 16:12	X	X	X	X	X	X	X	X	X	X

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 884174

Sample	Date/Time	Li6NG	Ge72H2	Ge72He	In115He	Lu175He
ZZZZZZ	06/26/25 13:04					
ZZZZZZ	06/26/25 13:07					
ICV	06/26/25 13:09	99	103	103	102	101
CCV	06/26/25 13:12	100	102	104	105	101
ICB	06/26/25 13:15	100	101	102	102	102
CCB	06/26/25 13:17	100	103	102	101	101
LLICVS	06/26/25 13:20	102	101	102	103	101
ICSA	06/26/25 13:22	95	98	97	96	99
ICSAB	06/26/25 13:25	96	97	98	96	99
ZZZZZZ	06/26/25 13:27					
ZZZZZZ	06/26/25 13:34					
ZZZZZZ	06/26/25 13:37					
ZZZZZZ	06/26/25 13:41					
KQ2510631-03MB	06/26/25 13:54	105	104	106	105	101
KQ2510631-04LCS	06/26/25 13:57	104	103	102	103	100
K2506168-001	06/26/25 13:59	102	101	99	99	100
K2506168-001DUP	06/26/25 14:02	99	102	99	99	99
K2506168-001SDL	06/26/25 14:04	100	102	102	102	100
K2506168-001PS	06/26/25 14:07	99	100	101	98	100
K2506168-001MS	06/26/25 14:09	100	100	99	98	100
K2506168-002	06/26/25 14:11	100	101	100	100	102
K2506168-003	06/26/25 14:14	100	101	100	100	101
K2506168-004	06/26/25 14:16	100	102	101	100	100
CCV	06/26/25 14:19	99	102	100	100	100
CCB	06/26/25 14:21	97	100	99	99	98
K2506168-005	06/26/25 14:24	98	101	100	100	101
K2506168-006	06/26/25 14:27	100	103	100	100	100
K2506168-007	06/26/25 14:29	101	101	101	100	101
K2506168-008	06/26/25 14:32	99	100	99	101	100
K2506168-009	06/26/25 14:34	99	102	100	99	100
K2506168-010	06/26/25 14:36	99	100	99	100	100
K2506168-012	06/26/25 14:39	99	104	103	102	101
K2506168-013	06/26/25 14:41	100	104	103	103	102
K2506168-014	06/26/25 14:44	99	102	102	100	101
K2506168-015	06/26/25 14:46	100	104	104	102	101
CCV	06/26/25 14:49	100	104	102	102	99
CCB	06/26/25 14:51	98	102	100	99	99

ALS Group USA, Corp.
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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 884174

Sample	Date/Time	Li6NG	Ge72H2	Ge72He	In115He	Lu175He
K2506168-016	06/26/25 14:54	98	103	102	101	100
K2506168-017	06/26/25 14:57	100	103	101	101	101
K2506168-018	06/26/25 14:59	100	102	102	102	100
K2506168-019	06/26/25 15:02	100	104	103	103	101
K2506168-020	06/26/25 15:04	100	103	102	100	101
CCV	06/26/25 15:07	98	102	101	101	98
CCB	06/26/25 15:09	97	100	99	100	98
KQ2510655-03MB	06/26/25 15:12	98	101	100	101	98
KQ2510655-04LCS	06/26/25 15:14	98	102	99	101	99
K2506168-021	06/26/25 15:17	99	103	103	102	100
K2506168-021DUP	06/26/25 15:19	103	105	104	104	101
K2506168-021SDL	06/26/25 15:22	101	105	103	104	101
K2506168-021PS	06/26/25 15:24	101	103	102	103	99
K2506168-021MS	06/26/25 15:27	101	103	101	101	99
K2506168-022	06/26/25 15:29	101	102	102	102	100
K2506168-023	06/26/25 15:32	101	102	102	102	100
K2506168-024	06/26/25 15:34	102	104	102	102	101
CCV	06/26/25 15:37	100	101	101	100	98
CCB	06/26/25 15:39	99	101	100	100	98
K2506168-025	06/26/25 15:42	101	104	104	103	100
CCV	06/26/25 15:44	101	103	101	101	99
CCB	06/26/25 15:47	97	99	100	100	98
KQ2510774-03MB	06/26/25 15:49	98	101	100	101	99
KQ2510774-04LCS	06/26/25 15:52	98	102	100	99	99
ZZZZZZ	06/26/25 15:54					
ZZZZZZ	06/26/25 15:57					
ZZZZZZ	06/26/25 15:59					
ZZZZZZ	06/26/25 16:02					
ZZZZZZ	06/26/25 16:04					
K2506168-011	06/26/25 16:07	102	103	100	101	99
CCV	06/26/25 16:09	100	100	99	99	97
CCB	06/26/25 16:12	97	101	97	96	96

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QA/QC Report

Client: Alaska Department of Fish and Game
Project: Palmer Project/

Service Request: K2506168

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Date/Time	Li6NG	Ge72H2	Ge72He	In115He	Lu175He
ZZZZZZ	06/24/25 09:14					
ZZZZZZ	06/24/25 09:17					
ICV	06/24/25 09:20	105	101	104	105	103
CCV	06/24/25 09:23	105	100	103	104	105
ICB	06/24/25 09:26	96	94	95	96	97
CCB	06/24/25 09:28	102	96	95	96	98
LLICVS	06/24/25 09:31	104	95	96	99	99
ICSA	06/24/25 09:34	103	95	95	94	100
ICSAB	06/24/25 09:37	102	94	93	93	100
ZZZZZZ	06/24/25 09:40					
ZZZZZZ	06/24/25 09:47					
ZZZZZZ	06/24/25 09:53					
ZZZZZZ	06/24/25 10:32					
ZZZZZZ	06/24/25 10:35					
ZZZZZZ	06/24/25 10:38					
ZZZZZZ	06/24/25 10:40					
ZZZZZZ	06/24/25 10:43					
ZZZZZZ	06/24/25 10:46					
ZZZZZZ	06/24/25 10:49					
CCV	06/24/25 10:52	106	96	95	97	102
CCB	06/24/25 10:55	102	91	92	93	98
ZZZZZZ	06/24/25 10:58					
ZZZZZZ	06/24/25 11:01					
ZZZZZZ	06/24/25 11:03					
ZZZZZZ	06/24/25 11:06					
ZZZZZZ	06/24/25 11:09					
ZZZZZZ	06/24/25 11:12					
ZZZZZZ	06/24/25 11:15					
ZZZZZZ	06/24/25 11:17					
ZZZZZZ	06/24/25 11:20					
ZZZZZZ	06/24/25 11:23					
CCV	06/24/25 11:26	108	91	87	89	96
ZZZZZZ	06/24/25 11:29					
CCB	06/24/25 11:36	106	89	84	87	97
ZZZZZZ	06/24/25 11:40					
ZZZZZZ	06/24/25 11:43					
ZZZZZZ	06/24/25 11:45					

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Date/Time	Li6NG	Ge72H2	Ge72He	In115He	Lu175He
ZZZZZZ	06/24/25 11:48					
ZZZZZZ	06/24/25 11:51					
ZZZZZZ	06/24/25 11:54					
ZZZZZZ	06/24/25 11:56					
CCV	06/24/25 11:59	102	89	86	90	95
ZZZZZZ	06/24/25 12:02					
CCB	06/24/25 12:10	100	86	84	86	91
ZZZZZZ	06/24/25 12:16					
ZZZZZZ	06/24/25 12:19					
ZZZZZZ	06/24/25 12:22					
ZZZZZZ	06/24/25 12:24					
ZZZZZZ	06/24/25 12:27					
ZZZZZZ	06/24/25 12:30					
ZZZZZZ	06/24/25 12:33					
ZZZZZZ	06/24/25 12:35					
ZZZZZZ	06/24/25 12:38					
ZZZZZZ	06/24/25 12:41					
CCV	06/24/25 12:44	99	90	86	88	93
CCB	06/24/25 12:47	95	85	83	85	91
ZZZZZZ	06/24/25 12:50					
ZZZZZZ	06/24/25 13:09					
ZZZZZZ	06/24/25 13:12					
ZZZZZZ	06/24/25 13:14					
ZZZZZZ	06/24/25 13:17					
ZZZZZZ	06/24/25 13:20					
ZZZZZZ	06/24/25 13:23					
ZZZZZZ	06/24/25 13:26					
ZZZZZZ	06/24/25 13:28					
ZZZZZZ	06/24/25 13:31					
CCV	06/24/25 13:41	102	87	84	88	92
CCB	06/24/25 13:44	99	86	83	86	91
KQ2510774-03MB	06/24/25 13:46	100	86	84	88	91
KQ2510774-04LCS	06/24/25 13:49	101	86	85	87	92
ZZZZZZ	06/24/25 13:52					
ZZZZZZ	06/24/25 13:55					
ZZZZZZ	06/24/25 13:58					
ZZZZZZ	06/24/25 14:01					

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 883767

Sample	Date/Time	Li6NG	Ge72H2	Ge72He	In115He	Lu175He
ZZZZZZ	06/24/25 14:03					
ZZZZZZ	06/24/25 14:06					
ZZZZZZ	06/24/25 14:09					
ZZZZZZ	06/24/25 14:12					
CCV	06/24/25 14:15	99	89	86	88	93
CCB	06/24/25 14:17	92	84	82	85	90
ZZZZZZ	06/24/25 14:20					
ZZZZZZ	06/24/25 14:23					
ZZZZZZ	06/24/25 14:26					
ZZZZZZ	06/24/25 14:29					
ZZZZZZ	06/24/25 14:31					
ZZZZZZ	06/24/25 14:34					
K2506168-011	06/24/25 14:37	98	90	88	90	96
ZZZZZZ	06/24/25 14:40					
ZZZZZZ	06/24/25 14:43					
CCV	06/24/25 14:46	97	89	84	87	92
CCB	06/24/25 14:49	94	83	82	84	89

Full lab report available upon request