GRAPHITE CREEK PROJECT
WATER QUALITY SURVEYS, 2014–2025

Prepared for

Graphite One (Alaska) Inc.
Anchorage, Alaska

Prepared by

ABR, Inc.—Environmental Research & Services
Fairbanks, Alaska

and

Tundra Consulting, LLC
Chugiak, Alaska

Cover:

Accessing upstream sampling site at the Graphite Creek Project, Imuruk Basin and project area lowlands in the distance.

Insets (top to bottom):

Scientist Caitlin Forster, ABR, and Captain Nick Topkok prepare to sample on the Imuruk Basin.

Scientist Jojo Baldus, ABR, collects a surface water sample at a project area stream.

Scientist Jojo Baldus, ABR, measures water depth at groundwater well.

Scidntist Jillian Soller, ABR, prepares to collect a turbidity sample at project area stream.

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Prepared for:

Graphite One (Alaska) Inc.
471 W. 36th Ave, Suit 100
Anchorage, AK 99503

Prepared by:

ABR, Inc.—Environmental Research & Services
1225 E. International Airport, Suite 110
Anchorage, AK 99518

and

Tundra Consulting, LLC
P.O. Box 670454
Chugiak, Alaska 99567

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1 INTRODUCTION

The Graphite Creek Project (GCP) is located ~59 km (37 miles) NNW of Nome, Alaska, on the Seward Peninsula (Figure 1). The project area, situated between the Kigluaik Mountains and the Imuruk Basin, has been the site of extensive exploration of graphite resources since 2012 (Barr, 2025). Graphite demand is expected to increase several fold over the next two decades as battery storage, defense, and the electric car industries see extensive gains in the market just as known graphite resources outside of China remain limited. Increased demand for graphite coupled with production shortfalls has resulted in extensive investment in the project by the U.S. government to facilitate the development of the GCP into a year-round mine, producing up to an estimated 175,000 tonnes graphite products per year (JDS 2022, Barr 2025).

In addition to collecting data on the graphite resources available, the project owners are advancing collection of environmental data, including fish and aquatic resources, hydrology, and water quality data to support the permitting process. Water quality survey work has been conducted since 2014, with multiple contractors involved in the collection and reporting process over that time frame. Since 2023, ABR, Inc.—Environmental Research & Services (ABR) has been contracted by Tundra Consulting LLC, (Tundra) to provide support for water quality data collection and management. ABR has collected surface water samples at streams, groundwater wells, and from nearby brackish water in Imuruk Basin and tested for both *in-situ* characteristics (e.g., pH, temperature, dissolved oxygen [DO]) and sent for laboratory chemical analysis of a full suite of analytes (e.g., metals, total dissolved solids, cyanide). ABR has also compiled the water quality data collected by other contractors on behalf of GCP during most years since 2014 for inclusion into a relational database to facilitate analysis and reporting.

The Alaska Department of Environmental Conservation (ADEC) generally requests multiple years of pre-development baseline water quality monitoring prior to potential mine development, with the goal of establishing baseline water chemistry conditions in surface waters and groundwaters in the vicinity of mining development projects. Additionally, ADEC may require continued seasonal water quality monitoring during mine development, production, and post-production periods. GCP water quality data will provide information critical to permitting the project. These data are also useful in determining the surrounding geologic conditions and assist biologists in conducting required environmental assessments.

In this report, ABR and Tundra analyze recent long-term baseline water quality conditions for GCP. To date, previous reports have focused on annual monitoring results. This is the first comprehensive report analyzing all years for which water quality data have been collected during 10 seasons at GCP (2014–2016, 2018–2019, and 2021–2025). The primary objectives for this report are to:

- Describe baseline water quality conditions for the project area's flowing surface waters, groundwater, and Imuruk Basin.
- Perform QA/QC analysis to determine the comparability of baseline water chemistry results from 10 seasons of data collected by multiple field contractors and analytical laboratories.
- Describe general trends for stream water, groundwater, and Imuruk Basin analyte concentrations relative to ADEC standards.

2 METHODS

2.1 FIELD SURVEYS

Over 10 field seasons, GCP water samples have been collected in a growing set of surface water sites, groundwater wells, and in Imuruk Basin. Surface water has been collected annually from 2014–2025, except for 2017 and 2020 when no sampling was conducted. Groundwater sampling began in October 2021 and continues to the present. Imuruk Basin water was collected 2022–2024. Field work has ranged from a single sample collection event (2015, 2018), to two sampling events (2016 and 2025), or three sampling events (2014, 2019, 2021–2024) annually. Sampling events have taken place

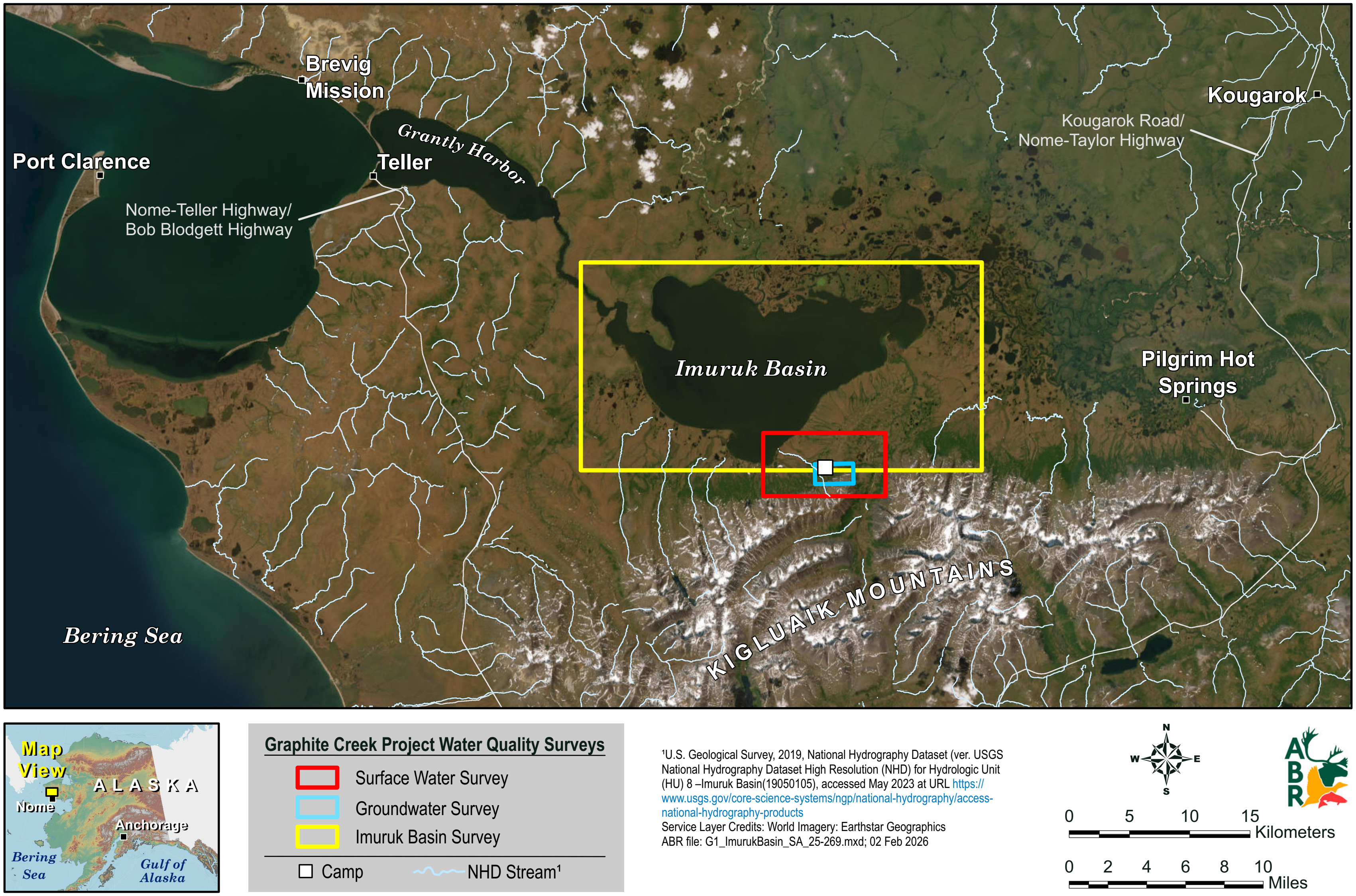

Figure 1. Project area for Graphite Creek Project water quality surveys near Teller, Alaska, 2014–2025.

between the months of May and October over time with the majority of sampling events occurring June–September. Field sampling events were conducted by 6 different contractors since 2014, including Tetra Tech (2014), Cal Craig (2015–2016, 2018), ERM (2019), Katana/ Restoration Science and Engineering (RSE) (2021–2022), and ABR (2023–2025). See Table 1 for a summary of field survey events.

2.2 GROUNDWATER SAMPLES

Beginning in October 2021, GCP contractors began sampling at newly installed wells, installed at strategic locations around the mine site to assist geologists in understanding the movement and makeup of groundwater at the GCP. Well installation has continued annually, particularly in 2024 when sampling took place at 6, 10, and finally 13 wells during the June, late July/ early August, and September sampling events, respectively (Table 2; Figure 2).

Monitoring wells are used for a variety of purposes in addition to water quality sampling. This usually includes continuous water level monitoring with a pressure transducer (TDX) installed in the well. The wells commonly have a heat trace installed due to potential freezing conditions. A digital temperature cable (DTC) may be installed to measure ground temperature and monitor permafrost conditions. In addition, some wells are flowing artesian which requires a special well head to control flow and prevent freeze damage in the winter. Each well is unique and requires a different combination of thawing, purging, and sample collection. Well boreholes are either vertical or angled and some pass through permafrost while others do not. For wells that spanned a permafrost layer, the sampling team powered a heat trace with a generator to ensure that the water column in the well was thawed (the screened interval is below permafrost, but water may rise in the well under artesian pressure). Sampling teams followed EPA (2013) standard protocols for determination of well depth and liquid water volume using a standard water level meter. Team members also reviewed detailed well data for each borehole prior to field deployment to assist in preparing for sampling. These well schematics and measured depth to water levels provided sampling team members with information on total well volume before sampling began.

Wells were either purged prior to sampling or were sampled using low flow sample techniques (EPA, 1996). For all wells requiring purging, a total of three well volumes were removed prior to sample collection. For wells with dedicated or temporary pump systems, the sampling team members initiated water flow and then waited until a steady flow was achieved. Next, they estimated flow rate from the pump by allowing water to flow into a 5-gallon bucket while timing the fill process. This measurement allowed the team to calculate the total time required to purge 3 well volumes [purge time (minutes) = 3 x well volume (gallons)/flow rate (gallons per minute)].

For the camp well the sampling team collected water at a point prior to the potable water system located in the shower and laundry house. First, they purged the well with the assistance of the camp manager by opening the bypass valve and draining water outside using the calculations for well and pipe volume as described above. They then collected the water sample at a bypass valve in the pumphouse.

When sampling at artesian wells, the sampling team controlled flow at the well head by use of a custom valve. The flow rate and purge time were determined as described above for pump installed wells. For two other sites, the sampling team purged wells by manually lowering PVC hand bailers into the bore hole and then emptying the water obtained in the bailers into a 5-gallon bucket, directly measuring the purged volume.

Low flow sampling techniques were used at wells with low recharge rates (EPA, 1996). For this method wells are not purged, but rather, the pump is in the well screen, and a very low flow of water is pumped to the surface for the sampling effort. Water levels inside the well were monitored throughout the process by use of a pressure transducer or water level meter to ensure that the water level was not drawn down but was instead removed at the same rate that water recharges into the well. *In-situ* water quality parameters were monitored in the water as it is pumped from the well (further described in "Ambient *In-Situ* Water Quality" below) until they stabilized, at which point sample was collected.

Table 1. Summary of annual water quality surveys for Graphite Creek Project near Teller, Alaska, 2014–2025.

Year	Number of Sampling Events	Month of Sampling Events	Contractor	Analytical Laboratory	Water Quality Type		
					Surface Water? (Yes/No)	Groundwater? (Yes/No)	Imuruk Basin? (Yes/No)
2014	3	June, July, September	Tetra Tech	SGS	Yes	No	No
2015	1	October	Cal Craig	ARS - Aleut	Yes	No	No
2016	2	May, August	Cal Craig	ARS - Aleut	Yes	No	No
2017	0	–	–	–	No	No	No
2018	1	August	Cal Craig	ARS - Aleut	Yes	No	No
2019	3	July, August, October	ERM	ARS - Aleut	Yes	No	No
2020	0	–	–	–	No	No	No
2021[a,b]	3	August[a], September[a], October[b]	Katana	ACZ - Colorado	Yes	Yes	No
2022	3	July, August, September	Katana	ACZ - Colorado	Yes	Yes	Yes
2023	3	June, August, September	ABR	ALS - Canada	Yes	Yes	Yes
2024	3	June, July, September	ABR	ALS - Canada	Yes	Yes	Yes
2025	2	July, September	ABR	ALS - Canada	Yes	Yes	No

[a] During August and September field survey events, only surface water was collected for analysis.
[b] During the October field survey event, only groundwater was collected for analysis.

Table 2. Ground water well site names, locations, and description for the Graphite Creek Project near Teller, Alaska, 2014–2025.

Hole ID	NAD83 UTM Zone 3		NAD83 degrees											
	Easting	Northing	Latitude	Longitude	Well Depth (m)	DTW (m)[b] (at installation)	DTW (m)[c] (during survey)	Watershed Area	Borehole Volume (gal)	Well Volume (gal)[d]	Sample Acquisition Method	Sample Event Period	Total Number of Sample Events	Contractor
21GC066	474638	7212807	65.03809	-165.538593	306.3	37.9	40.7	Upland	164	142	D	2021–2023	6	K, ABR
21GC068	474349	7212936	65.03921	-165.544747	151.6	-49.4	0.0	Upland	81	81	A	2021–2025	12	K, ABR
21GTW007	473534	7213681	65.04584	-165.562205	76.4	44.7	44.9	Lowland	41	17	D	2021–2025	12	K, ABR
22GC075	474243	7212723	65.0373	-165.546974	148.7	-4.9	0.0	Upland	80	80	A	2022–2025	8	K, ABR
22GT008D	474277	7213026	65.040021	-165.546302	78	62	65.5	Lowland	42	7	B	2022, 2024–2025	7	K, ABR
22GT008S	474277	7213026	65.040021	-165.546302	46	36.5	32.6	Lowland	25	7	D	2022–2025	10	K, ABR
23GCT016	474516	7212782	65.03785	-165.54119	36	30.7	28.3	Upland	19	4	B	2023–2025	7	ABR
23GC099	475042	7213016	65.03999	-165.53006	145	45.7	45.7	Upland	78	53	D	2023–2025	5	ABR
23GCT018	475042	7213016	65.03999	-165.53006	40.8	25.8	22.2	Upland	22	10	T	2024–2025	4	ABR
24GCT019	473786	7212716	65.0372	-165.5567	144.8	0	0.0	Upland	77	77	A	2024–2025	4	ABR
24GCT022	473676	7213233	65.04183	-165.55913	145.4	73.1	77.9	Lowland	78	36	AL	2024–2025	4	ABR
24GCT026	472839	7213880	65.04757	-165.57704	162.5	46	46.0	Lowland	87	62	T	2024–2025	3	ABR
24GCT028	474231	7212621	65.03638	-165.54724	143.9	7.5	10.1	Upland	77	72	T	2024–2025	3	ABR
24GCT029	474229	7212620	65.03637	-165.54727	41.5	10.7	12.9	Upland	22	15	T	2024–2025	3	ABR

[a] Well hole ID's 12GC001 and 12GC002 are legacy groundwater wells that no longer exist and were only sampled in 2014 and 2016. Results are not included in this analysis.
[b] DTW = Depth to Water; a negative DTW value refers to flowing artesian conditions.
[c] Average of the most recent year in which it was sampled (2025).
[d] Approximate well volume for reference, based on average of 2025 calculations.
Sample Acquisition Method: A = Artesian Well, AL = Air lift pump, B = Hand Bailer, C = Camp Dedicated Pump, D = Well Dedicated Pump, T = Temporary Pump
Contractor: K = Katana; ABR= ABR, Inc.— Environmental Research & Services

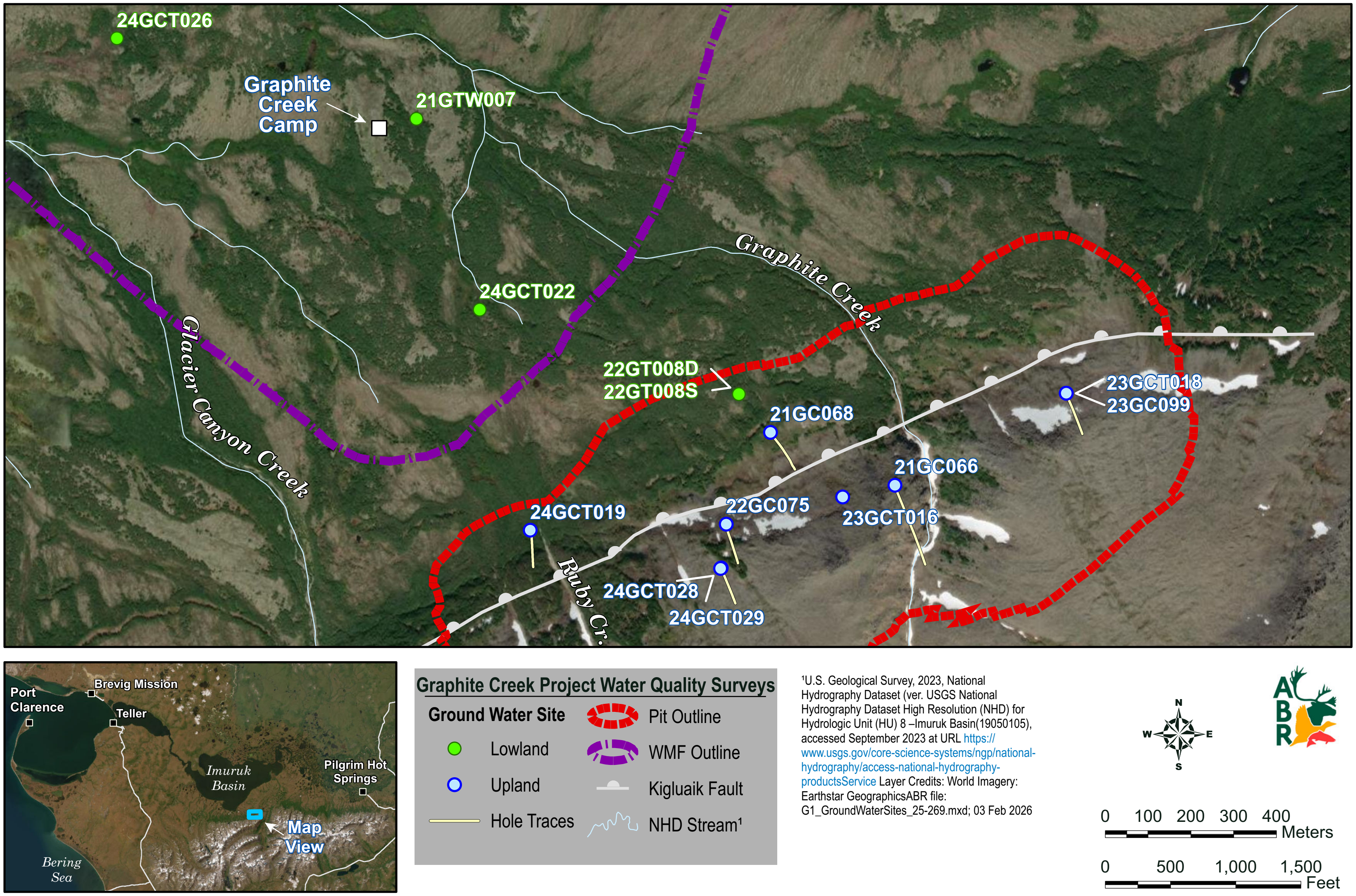

Figure 2. Groundwater sampling sites of the Graphite Creek Project water quality surveys area near Teller, Alaska, 2014–2025.

Once purging was complete, the team collected water samples directly from the point of flow, which is either silicone tubing connected to the pump, directly from the custom control valves, or from the hand bailer check valve. Water was directed into laboratory-provided bottles, making sure to fill the bottles completely, while minimizing aeration. Each kit bottle was then placed back into its resealable bag, which was then labeled with a site ID, sampling date, and grab time. All samples were placed into coolers for transport to camp where they were prepared for shipping to the analytical laboratory for testing (See Laboratory Testing below).

Groundwater well samples were collected for laboratory analysis similar to the process described in Surface Water Samples above. Samples were stored in coolers for transport back to camp and ultimately to the laboratory for testing (See Laboratory Testing below).

2.3 SURFACE WATER SAMPLES

Surface water collection for area streams began in 2014 with sampling occurring at the Cobblestone River, Graphite Creek, Glacier Canyon Creek, Ruby Creek, Trail Creek, and an unnamed tributary to the Cobblestone River (Table 3). Over time, project managers have added additional sites on existing project area streams as well as an additional unnamed tributary. In 2025, ABR collected surface water for laboratory analysis at 13 sites on 7 project area streams (Table 3; Figure 3; Appendix A). The upper portion of Glacier Canyon Creek was previously referred to as Ptarmigan Creek (with PT1 or PT2 site ID) during 2014 water quality sampling based on a geologic report from 1944 (Coats, 1944; Tetra Tech, 2014) (Table 3). However, current USGS topographic maps indicate that this upper portion of the creek also should be referred to as Glacier Canyon Creek. The PT abbreviation for samples sites continues for consistency, but the stream will be referred to as Glacier Canyon Creek.

Sampling has typically been conducted by a 2-person field sampling team over the 10 sampling seasons since 2014. During sampling events, team members were transported daily by either foot, utility terrain vehicle (UTV), or helicopter from GCP camp facilities to sampling sites. Survey team members have generally followed well established water quality sampling protocols outlined by the Environmental Protection Agency (EPA) or U.S. Geological Survey (Wilde and Radtke 2006; Simmons 2023) and recorded in the project Quality Assurance Project Plan (ABR, 2024). Upon arriving at each site, the sampling team wears clean powderless nitrile gloves and then removes laboratory sample kits from resealable plastic bags kept in secure coolers. Though most laboratories differ slightly in process, most provide the sampling team with kits containing 6 bottles corresponding to the various laboratory analyte tests (See Laboratory Testing below).

At each site, the sampling team determined a point from which to sample water upstream of any disturbed substrate. Surface water samples were collected from the stream using the “grab sample” technique in which laboratory-provided bottles were dipped into the surface water of the waterbody being sampled, making sure to fully immerse the bottles, while minimizing aeration. Each kit bottle was then placed back into its resealable bag, which was then labeled with a site ID, sampling date, and grab time. All samples were placed into coolers for transport to camp where they were prepared for shipping to the analytical laboratory for testing (See Laboratory Testing below).

2.4 IMURUK BASIN WATER SAMPLES

Water quality sampling occurred 1–3 times annually in the Imuruk Basin from 2022–2024, and during a single instance in Tuksuk Channel in September 2024 (Table 4; Figure 4). A total of 13 monitoring sites (plus nearby alternate sites) were established by 2024 (Tables 1 and 4). Sampling took place during summer or fall to monitor depth profiles of ambient *in-situ* water conditions and to collect water samples for laboratory analytical testing at a subset of sites (Figure 4; Appendix A).

Prior to collecting water, the field sampling team members were transported via helicopter to rendezvous with a project boat captain moored approximately 4 miles west of camp. The captain and sampling crew accessed Imuruk Basin aboard an 18-foot aluminum skiff. At each of the 13 monitoring sites, the sampling crew approached at a slow speed and dropped an anchor to prevent

Table 3. Surface water sample site names, locations, and description for waterbodies of the Graphite Creek Project near Teller, Alaska, 2014–2025.

		NAD83 UTM Zone 3		NAD83/WGS84 Decimal Degrees					
Site	Waterbody	Easting	Northing	Latitude	Longitude	Sample Event Period	Total Number of Sample Events	Contractor	Description
CO1	Cobblestone River	477872	7215648	65.06381	-165.47038	2014–2016, 2018–2019, 2021–2025	23	TT, CC, ERM, K, ABR	Cobblestone River upstream
CO2	Cobblestone River	477286	7215752	65.0647	-165.48285	2014–2016, 2018–2019, 2021–2025	23	TT, CC, ERM, K, ABR	Cobblestone River downstream of unnamed stream
GR1	Graphite Creek	474664	7212294	65.03348	-165.53796	2014–2016, 2018–2019, 2021–2025	21	TT, CC, ERM, K, ABR	Graphite Creek - upstream of confluence with Ptarmigan Cr.
GR1a[a]	Graphite Creek	474668	7212918	65.03908	-165.53798	2016	1	CC	Downstream from original Graphite Creek station 1.
GR2	Graphite Creek	473070	7214219	65.05063	-165.57217	2014–2016, 2018–2019, 2021–2025	23	TT, CC, ERM, K, ABR	Upper Graphite Creek
GS1	Graphite Creek	474247	7213382	65.04321	-165.54701	2021–2025	13	K, ABR	Graphite Creek gauging station
PT1[b]	Glacier Canyon Creek	473445	7211681	65.02789	-165.56372	2014–2016, 2018–2019, 2021–2025	19	TT, CC, ERM, K, ABR	Upper Glacier Canyon Creek
PT1a[a, b]	Glacier Canyon Creek	473282	7212408	65.0344	-165.56732	2016, 2023–2024	3	CC, ABR	Downstream from original Glacier Canyon Creek station 1.
PT2[b]	Glacier Canyon Creek	472831	7213395	65.04322	-165.57709	2014–2016, 2018–2019, 2021–2025	23	TT, CC, ERM, K, ABR	Glacier Canyon Creek, upstream of gauging station GS2
PT3	Glacier Canyon Creek	471982	7214099	65.04946	-165.59526	2025	2	ABR	Downstream Glacier Canyon Creek, below confluence with Graphite Creek
RB1	Ruby Creek	473794	7212767	65.03766	-165.55652	2014–2016, 2019, 2021–2025	16	TT, CC, ERM, K, ABR	Ruby Creek - located between Graphite & Glacier Canyon Cr.
RB1a[a]	Ruby Creek	473803	7212749	65.0375	-165.55632	2016, 2023–2025	5	CC	Downstream from original Ruby Creek station 1.
TR1	Trail Creek	472479	7212275	65.03314	-165.58434	2014–2016, 2018–2019, 2021–2025	21	TT, CC, ERM, K, ABR	Trail Creek
UCA1	Unnamed Creek A	475925	7214062	65.04944	-165.51149	2014, 2019, 2021–2025	19	TT, ERM, K, ABR	Small unnamed surface stream A flowing into Cobblestone River
UCB1	Unnamed Creek B	476244	7213547	65.04484	-165.50465	2024–2025	5	ABR	Small unnamed surface stream B flowing into Cobblestone River
UCB2	Unnamed Creek B	476238	7213987	65.04879	-165.50484	2024–2025	5	ABR	Small unnamed surface stream B flowing into Cobblestone River
UCX1[c]	Unnamed Creek X	470241	7212157	65.03189	-165.63183	2015–2016, 2018	4	CC	Small unnamed surface stream flowing into Imuruk Basin west of UCA and UCB tributaries.

[a] Alternate stream site downstream from the originally designated site. These sites were sampled in place of the original site due to dry stream bed conditions upstream.
[b] Glacier Canyon Creek was historically referred to as Ptarmigan Creek (PT1 and PT2)
[c] Tributary UCX1 (no longer sampled) was sampled in 2015, 2016, and 2018 and was well outside the normal sample area.
Contractor: TT= Tetra Tech; CC= Cal Craig; ERM= Environmental Resources Management; K= Katana; ABR= ABR, Inc.- Environmental Research & Services
Notes: NAD 83 UTM Zone 3 is the project datum and should be used by the professional. Aircraft often can only utilize decimal degrees or similar.
For navigation purposes, NAD83 and WGS84 can be considered the same.
A site name with a lower case letter "a" designation following the site ID number represents an alternate site used when primary site was not accessible due to snow cover.

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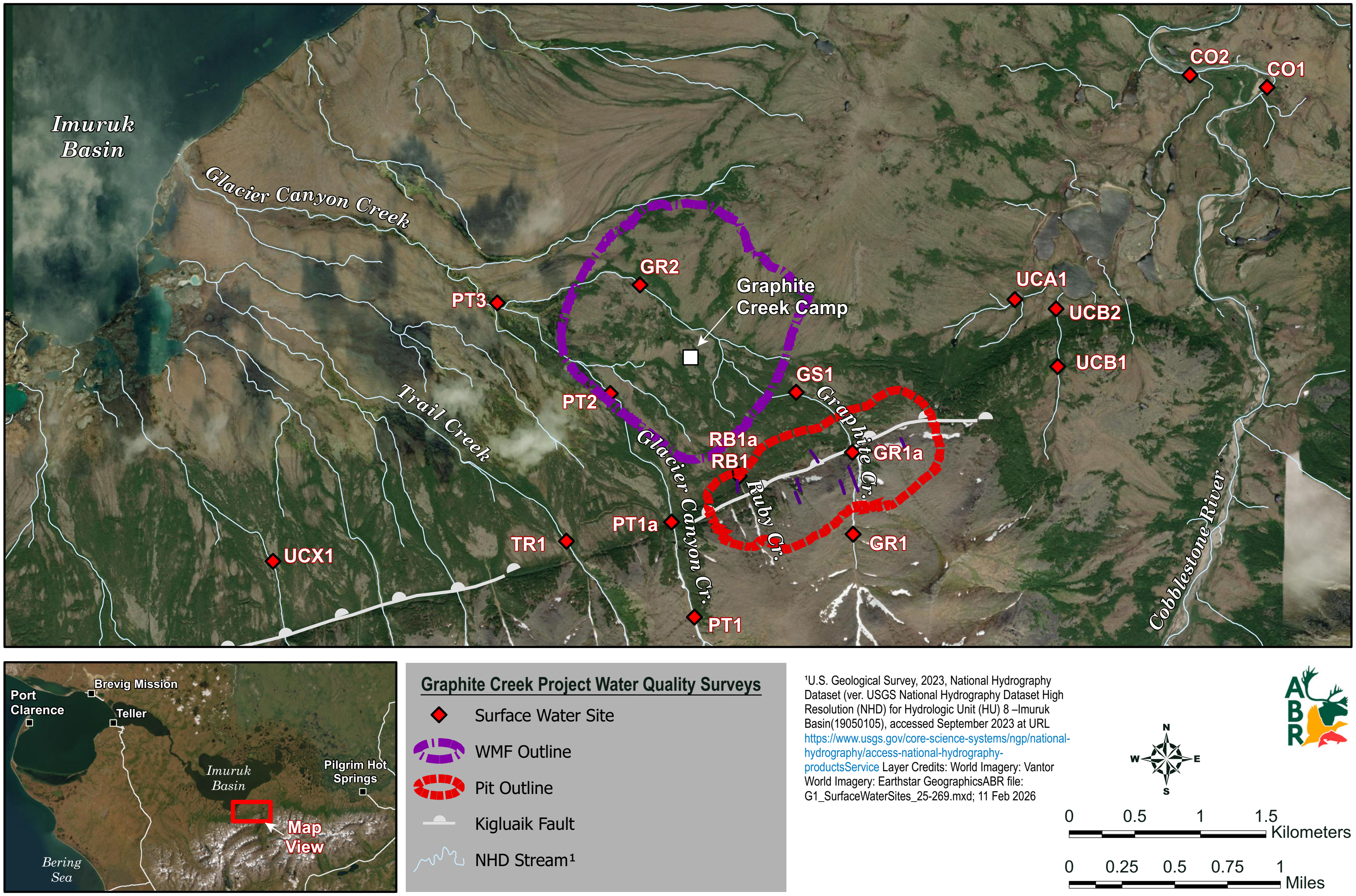

Figure 3. Surface water sampling sites of the Graphite Creek Project water quality surveys area near Teller, Alaska, 2014–2025.

Table 4. Site location, number of sample events, and contractor responsible for in-situ and laboratory water chemistry sampling of Imuruk Basin sample sites on the Graphite Creek Project near Teller, Alaska, 2014–2025. Total water depth and laboratory water quality sample depths are included for designated sites.

	NAD83 UTM Zone 3		NAD83 degrees						
Site	Easting	Northing	Latitude	Longitude	Water Depth (ft)	Laboratory Water Quality Sample Depths (ft)[a, b]	Sample Event Period	Total Number of Sample Events	Contractor
IM01	459684	7219412	65.095861	-165.858036	Not Recorded	NA	2022	2	K
IM01a	459906	7220318	65.104016	-165.853571	13	NA	2023–2024	6	ABR
IM02	460716	7223078	65.128876	-165.837107	23	6, 18[c]	2022–2024	8	K, ABR
IM03	462227	7224109	65.138302	-165.805193	15	NA	2022–2024	8	K, ABR
IM04	464739	7217070	65.075422	-165.749867	Not Recorded	NA	2022	2	K
IM04a	465281	7217574	65.080006	-165.738471	11	NA	2023–2024	3	ABR
IM05	462663	7224034	65.137681	165.795886	Not Recorded	NA	2022	2	K
IM05a	465782	7220640	65.107566	-165.728568	15	NA	2023–2024	6	ABR
IM06	466142	7225135	65.147932	-165.721997	14	NA	2022–2024	8	K, ABR
IM07	470701	7216759	65.073214	165.623017	Not Recorded	NA	2022	2	K
IM07a	471250	7217870	65.083233	-165.611581	11	3, 9[c]	2023–2024	6	ABR
IM08	470651	7219371	65.096650	-165.624644	Not Recorded	NA	2022	2	K
IM08a	470856	7220786	65.109362	-165.620571	13	NA	2023–2024	6	ABR
IM09	469805	7223441	65.133088	-165.643525	12	NA	2022–2024	8	K, ABR
IM10	475586	7221123	65.112767	-165.519922	Not Recorded	NA	2022	2	K
IM10a	475517	7221574	65.116810	-165.521467	12	NA	2023–2024	6	ABR
IM11	475523	7222512	65.125225	165.521500	Not Recorded	NA	2022	2	K
IM11a	474916	7222958	65.129183	-165.534517	14	NA	2023–2024	6	ABR
IM12	475382	7224192	65.140289	-165.524806	11	NA	2022–2024	8	K, ABR
IM13	453836	7228661	65.178070	-165.985570	55	NA	2024	1	ABR

[a] Beginning at the surface, in-situ water quality measurements are made using a YSI Pro Plus probe at one meter increments for salinity, temperature, Dissolved Oxygen, Conductivty, and pH.

[b] Beginning at 0.5 m depth, in-situ measurements water quality are made using a YSI probe at half meter increments for salinity and temperature.

[c] Turbidity is measured at depth with a Hach Turbidimeter where laboratory water chemistry samples are collected.

Contractor: K= Katana, ABR= ABR, Inc.- Environmental Research & Services

Notes: A site name with a lower case letter "a" designation following the site ID number represents an alternate site where samples were collected by ABR in 2023–2025.

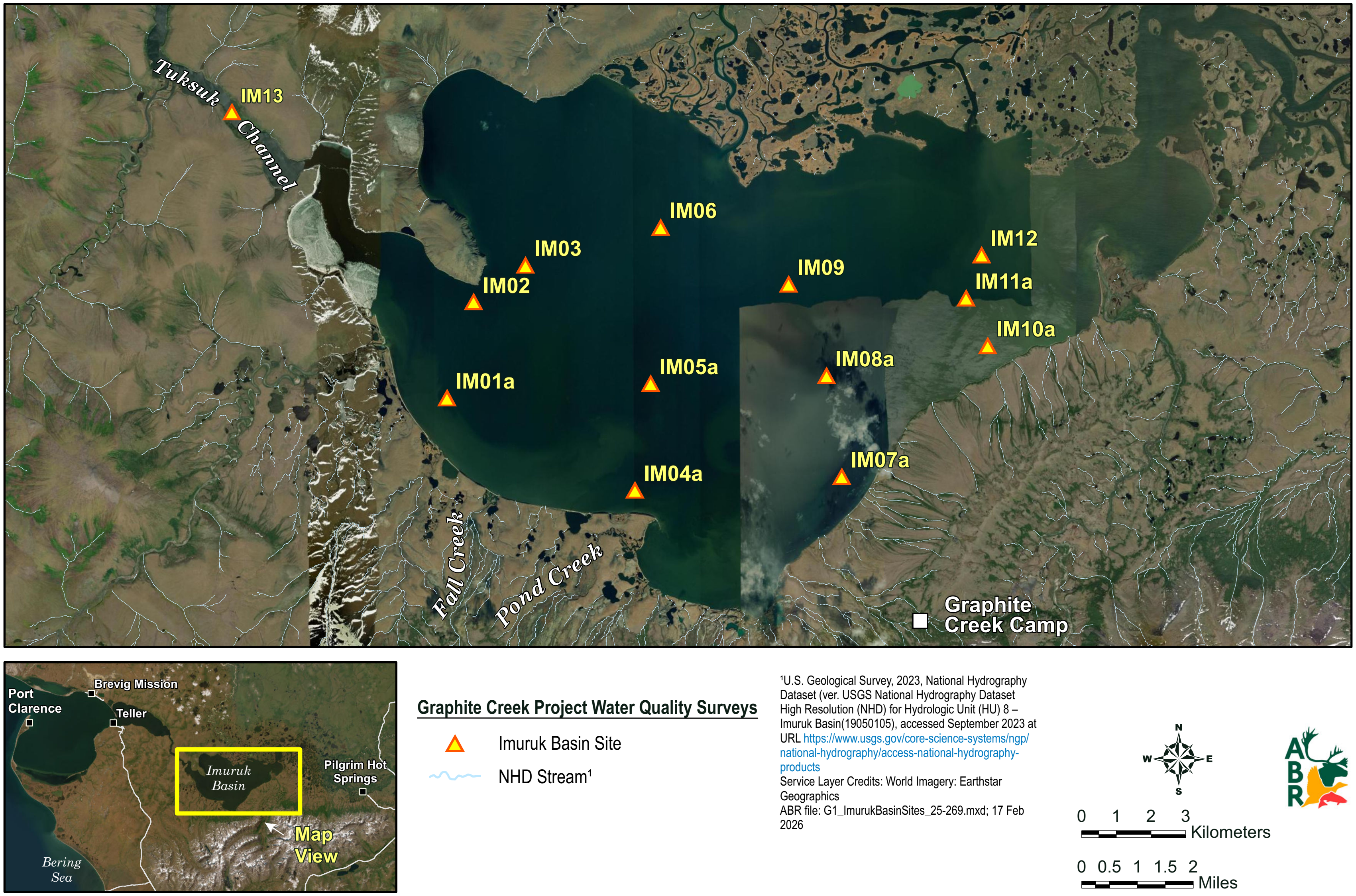

Figure 4. Imuruk Basin sampling sites of the Graphite Creek Project water quality surveys area near Teller, Alaska, 2014–2025.

drifting. Ambient *in-situ* water conditions (See *Ambient In-Situ Water Quality* below) were measured at 0.5-meter depth intervals for temperature and salinity and 1.0-meter depth intervals for other *in-situ* measurements from the surface to the bottom of the water column. At 2 of the 13 sites, a Van Dorn horizontal water sampler has been used to collect water at 2 different site location-dependent depths for detailed laboratory analysis of water chemistry (Table 4; Appendix A). In total, four laboratory water chemistry samples were collected in the Imuruk Basin per sampling event, for a total of 12 samples per year. Samples were stored in coolers for transport back to camp and ultimately to the laboratory for testing (See *Laboratory Testing* below).

2.5 AMBIENT *IN-SITU* WATER QUALITY

Specific procedures used by ABR are described below. Procedures used by other contractors are largely consistent, with some variation in instruments that were used.

Ambient *in-situ* water quality conditions were also measured at each sample site for surface water, groundwater, and Imuruk Basin. Temperature (°C), pH, conductivity (µS/cm), specific conductance (µS/cm), and dissolved oxygen (mg/L and % DO) were measured at each site using a portable YSI Professional Plus Multiparameter Meter (YSI). For surface water, *in-situ* water quality was measured just upstream from the location of laboratory sample grab locations, with care to avoid collecting disturbed substrate in the water samples. Groundwater *in-situ* water quality data were collected either in a YSI flow cell connected to the pump tubing or during the low-flow pumping process. In the Imuruk Basin, *in-situ* ambient conditions were measured by deploying a YSI probe to 0.5-meter depth intervals from the surface to the bottom of the water column. At 2 of the 13 sites, a Van Dorn horizontal water sampler was used to collect a small sample of water which was placed in a clean 250-ml bottle and transported back to field camp for analysis of turbidity (measured in nephelometric turbidity units [NTU]) using a portable turbidometer (Hach 2100P Turbidometer). Oxidation-reduction potential (ORP) was measured using a Hanna HI98120 handheld meter (See Appendices B–D for ambient in-situ water quality measurements).

2.6 LABORATORY TESTING

As noted, water quality analytical samples were collected by 6 contractors and analyzed by 4 different labs (Table 1). While each lab has slightly different internal protocols, reporting limits, and QA/QC methods, each provides the same general set of services (See Appendix E for a list of analytical tests by laboratory). The samples were analyzed for a full suite of metals, as well as mercury, alkalinity as CaCO3, chloride, fluoride, and sulfate water hardness, total dissolved solids, total suspended solids, total cyanide, weak acid dissociable cyanide, ammonia, and nitrate-N and nitrite-N. Samples were analyzed by SGS (2014 and 2019), ARS - Aleut (2015–2016 and 2018), ACZ (2021–2022), and ALS (2023–2025) (see Table 1). In some years, the analytical laboratory also measured water sample pH. However, for any comparisons of laboratory analyte results to pH, field measurements used for analysis (pH is a field measurement because laboratory analysis exceeds holding time).

Standard chain-of-custody protocols were maintained during sample transport of samples from the field to the analytical laboratory. Quality control and the relative comparability of results across years can be found in Appendix E and Appendix F (See *Quality Assurance and Quality Control* below)

2.7 DATA MANAGEMENT AND ANALYSIS

Following the 2023 sampling events, ABR created a PostgreSQL (SQL) relational database to manage the water quality sampling dataset from the GCP. All field and laboratory analytical data are currently stored, maintained, and backed-up on ABR secure servers, including efforts by ABR (2023–2025) and previous contractors (2014–2022), and can be accessed through a secure web interface. The database facilitates comparison of water quality data by station, season, and year during analysis and reporting for this and all future reporting efforts. The database is also constructed to integrate with ABR's data-collection apps on portable electronic devices, which will streamline future field data collection efforts.

We used a combination of SQL queries and analytical scripts from the computing program R (R Core Team, 2025) to access the water quality database, and process and report water quality data. All scripts are maintained on ABR's git repository. The git repository ensures version control, repeatability of results, and accessibility of code among users.

Water quality laboratory results were summarized and compared to ADEC water quality standards. Alaska Water Quality (AWQ) standards are specific to the water's designated use. Water-use categories include drinking water, stockwater and irrigation, aquatic life criteria for freshwater, aquatic life criteria for marine water, and human health consumption (ADEC 2022). If a waterbody has multiple uses (e.g., fish habitat, drinking water, irrigation needs) the water quality criteria for that waterbody is based on the most stringent use for that stream. For this project the laboratory results were compared to the most stringent criteria of the potential water-use categories for any given analyte (e.g., drinking water in the example above). Additionally, we calculated hardness-dependent AWQ standards for cadmium, copper, lead, nickel, silver, and zinc (Appendix B1–3). For consistency, all analyte concentrations are reported in µg/L. If the result from an analytical test was below the method detection limit (MDL), we report the result as <MDL. However, we use half of the detection limit in summary statistics and graphics as it is unlikely that the concentration is truly zero.

2.8 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

2.8.1 INSTRUMENT CALIBRATION

While we cannot speak to the exact calibration procedures of previous contractors, we assume certain standards for instrument calibration were maintained similar to those in 2023–2025 by ABR. The YSI meter used for *in-situ* water quality measurements was calibrated daily for conductivity, DO, and pH as outlined in the YSI user manual (YSI, 2009). The meter was calibrated in that order as the performance of the conductivity probe impacts the accuracy of the DO probe. This is because salinity, which is calibrated at the same time as conductivity, impacts the ability of water to hold oxygen. The pH calibration was performed last. If field measurements indicate wide variance in measurements throughout the day, the sampling team recalibrated the instrument (particularly for pH). If during the same sample day, the sampling team traveled between any combination of Imuruk Basin, surface water sites, and groundwater sampling stations, or if elevation changes occurred between sites, it was necessary to adjust barometric pressure readings for the YSI and recalibrate. All calibration efforts were documented (date, time, standards used, pH millivolt readings) in the project field notes using a calibration datasheet.

2.8.2 FIELD DUPLICATES AND FIELD BLANKS

Field sampling crews typically collect additional samples as part of the QA/QC process at GCP. Field duplicate samples were filled with water from the parent sampling site (stream water, groundwater, or Imuruk basin water) and were used to assess variability in analyte concentrations. Field blank samples were filled with laboratory grade deionized water and are used to assess potential sources of contamination during sampling event activities (e.g., handling techniques). The number and type of QC samples collected varied by year since 2014. During each sampling event since 2023, we collected a duplicate sample at 2 sites per sampling event. We also collect 2 field blank samples per sampling event. The QC sample locations varied between groundwater, surface water, and Imuruk Basin sites throughout the sampling events.

2.8.3 COMPARABILITY OF LABORATORIES AND CONTRACTORS

As noted above, water samples have been collected by multiple contractors and sent for analysis to multiple laboratories since 2014 (Table 1). Additionally, sampling events occurred at varying times from year to year, and there were two years when no samples were collected. As such we attempted to assess data comparability of laboratory results since 2014 by performing a suite of quantitative and qualitative statistical tests. The assumption is that all data is comparable and can be used as one data set. We investigated whether any data classes (e.g., laboratory, test method) were significantly different for reasons that could not be explained (e.g., yearly or seasonal variation). If a class member (e.g., a specific lab) was found to be significantly different the results are flagged in the database and no longer used. The tests were performed on the major metals with over 10% exceedances). See Appendix F for a summary of this effort.

2.8.4 QUALITY ASSURANCE PROJECT PLAN

The G1 Quality Assurance Project Plan (QAPP) was developed in 2024 (ABR 2024). The purpose of a project QAPP is to ensure that scientific standards of validity and defensibility are upheld to meet regulatory permitting requirements. The QAPP for GCP water quality monitoring offers a roadmap for work process during data collection, management, and analysis. These processes may include details on field sampling techniques, calibration procedures, and data quality objectives. Field sampling techniques and calibration procedures are discussed in detail above. As noted, we provided laboratories with duplicate samples from the same sites. The QAPP provides guidance on comparing laboratory precision, accuracy, completeness, representativeness, and comparability. For additional analysis of these measures, see Appendix G.

3 RESULTS

3.1 QUALITY CONTROL AND QUALITY ASSURANCE (QA/QC)

A summary of the QA/QC analyses are reported in Appendices E and F. The analysis is both quantitative and qualitive and indicates that no laboratory or test method is substantially different than the others. Laboratory, test method, and contractor are highly correlated. Because laboratory and test method show no substantially different members, it is reasonable to assume there is no difference based on contractor. All results are deemed useable except for some *in-situ* pH measurements (likely due to instrument calibration issues).

The data have also been reviewed for QAPP compliance (Appendices F and G). Based on this review, specific samples analyses or analytical batches have been flagged as not meeting QC standards and have been excluded from further consideration.

3.2 GROUNDWATER QUALITY

Groundwater in the project area occurs in two distinct hydrogeologic systems: a fractured bedrock aquifer in the uplands south of the Kigluaik Fault and an unconsolidated sediment aquifer in the lowlands north of the fault (Figure 2). These systems differ in permeability, hydraulic behavior, and geochemical character. The Kigluaik Fault has very low permeability and restricts flow from the upland aquifer to the lowland aquifer.

Water quality data for both systems was first collected during the 2021 field program and has continued each year with additional wells added annually through 2024 (Table 2). The laboratory results include major ions, metals, pH, conductivity, alkalinity, and TDS. Temperature, turbidity, DO, pH, and conductivity are measured in the field at the time of sampling. Where applicable, results are compared to water quality criteria in AWQS (18 AAC 70), including hardness-adjusted criteria for cadmium, copper, lead, nickel, silver, and zinc (Forster and Seigle 2024; ADEC 2025).

In the following sections, data distributions are based on percentile as shown in the boxplots. “Typical” range refers to the middle 50% if the data (25th percentile to 75th percentile – the hinges on the boxes). If presenting results for multiple wells the “typical” is from the 25th percentile of the well with lowest concentrations in the group to the 75th percentile of the highest well in the group. “Distinctly” or “distinctive” are used rather than “significantly” for something that is judged to be significantly different but not proven to be significantly different by the appropriate statistical test. A summary of analytical laboratory results is provided in Appendix A, while *in-situ* field measurements are provided in Appendices B–D).

3.2.1 UPLANDS

The upland groundwater data was collected from wells located in bedrock in the proposed pit area (Figure 2). Some wells were collared on the north (lowland) side of the fault but are screened on the south side of the fault (the fault dips to the north and the holes are inclined to the south – see hole traces in Figure 2). The aquifer was generally sampled at intermediate depths (150 to 200 m) which roughly corresponds to the bottom of the proposed pit. This is also below the bottom of permafrost which is generally about 100 m below ground surface. One sample location was much deeper (306 m) (well 21GC066; Table 2). Three samples were collected near the top of the aquifer (36 to 42 m) (wells 23GCT016, 23GCT018, and 24GCT029; Table 2). There is a discontinuous permafrost interval from approximately 35 m to 100 m depth that has a perched aquifer above. Two of the shallow samples were collected in the perched aquifer (23GCT016 and 24GCT029).

Water type

The upland groundwater is generally a calcium-magnesium sulfate water type. One location is exceptional however (near the Kigluaik Fault and Ruby Gulch) with a mixed sulfate water type that has equal parts calcium and sodium, and little magnesium (Figure 5).

Temperature

Groundwater temperatures are consistently in the 2–4 ^{o}C range with August tending to be the warmest. Deep groundwater is similar. The perched aquifer is more variable with low temperatures near 1 ^{o}C (Appendix A).

pH and alkalinity

The groundwater pH is variable with no apparent pattern relative to depth or location (Figure 6, Table 2, Appendix B). Groundwater at most sample locations range from mildly acidic to very basic (typical range of 6.2 to 10). Three locations stand out; two locations are distinctly acidic with median pH of 5.5 (well 22GC075) and 3.0 (well 24GCT029) respectively. One other location is distinctly basic with a median pH of 12 (well 23GC099).

The regulatory standard for alkalinity specifies that it should not be *below* 20 mg/L

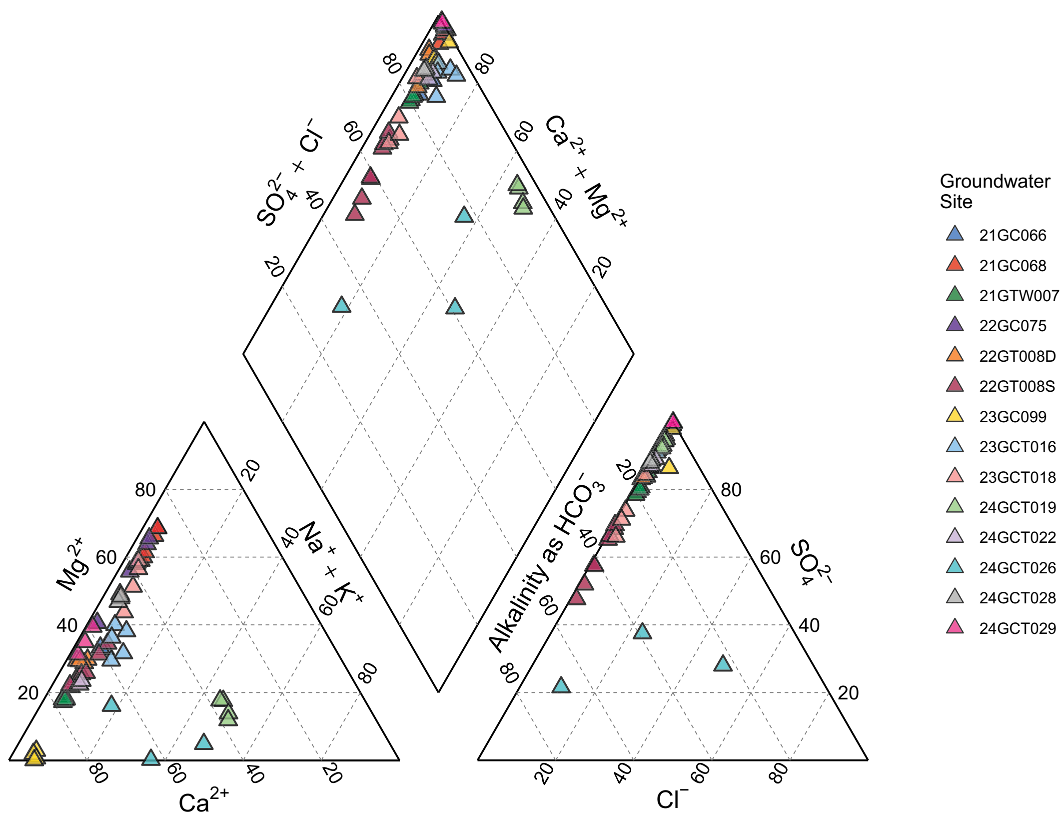

Figure 5. Piper Diagrams for groundwater wells of the Graphite Creek Project water quality survey area near Teller, Alaska 2023–2025. Piper diagram does not include legacy data 2014–2022.

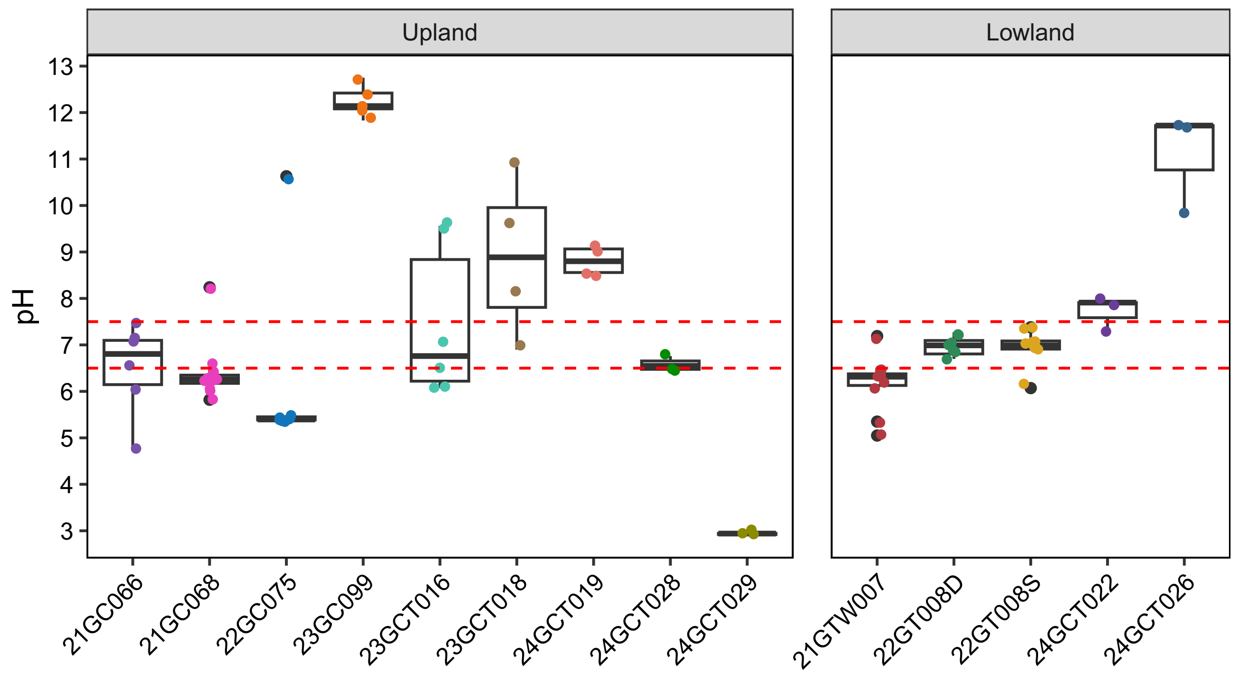

Figure 6. Ambient *in situ* pH measured at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

(ADEC 2025). The upland aquifer has a wide alkalinity range, and similar to pH, there is no apparent pattern relative to depth or location (Figures 6 and 7). The aquifer generally has low alkalinity, but above the regulatory criteria, ranging from 18 to 100 mg/L (Appendix A). Four locations stand out, with two corresponding to the very low pH locations (well 22GC075 and 24GCT029) and which also have very low alkalinities in the range of 0.5 to 1 mg/L (Figure 6, Appendix A). One of the two high alkalinity locations corresponds to the high pH location (well 23GC099). These two locations have alkalinities in the 100 to 400 mg/L range. Alkalinity exceeds regulatory criteria in 31% of samples collected to date (Table 5).

Total dissolved solids and sulfate

TDS and sulfate exceed regulatory standards in 84% and 88% of the samples collected to date, respectively (Table 5).

Typical TDS concentrations range from 700 to 1500 mg/L, exceeding the regulatory standard of 500 mg/L (Figure 8). Two samples from the top of the aquifer have distinctly lower TDS with median concentrations of 250 mg/L (well 23GCT016) and 490 mg/L (well 23GCT018), while the third shallow location is unremarkable (well 24GCT029). Three locations in the central part of the planned pit have distinctly high TDS concentrations ranging from 4000 to 10000 mg/L (wells 21GC068, 22GC075, and 24GCT028).

The sulfate content is correlated with TDS (Figure 9), exceeding the regulatory limit of 250 mg/L at all locations except one (well 23GCT018) (Figure 10). The typical sulfate range is 500 to 1000 mg/L. As with TDS, two of the shallow locations are distinct with median concentrations of 120 mg/L (well 23GCT016) and 280 mg/L (well 23GCT018) while a third shallow location (well 24GCT029) is unremarkable. Also similar to TDS, three locations in the central planned pit area are distinctly high with sulfate concentrations ranging from 2500 to 9000 mg/L (wells 21GC068, 22GC075, and 24GCT028).

Metals

The following results are based on total metals. Total metals are used throughout this document.

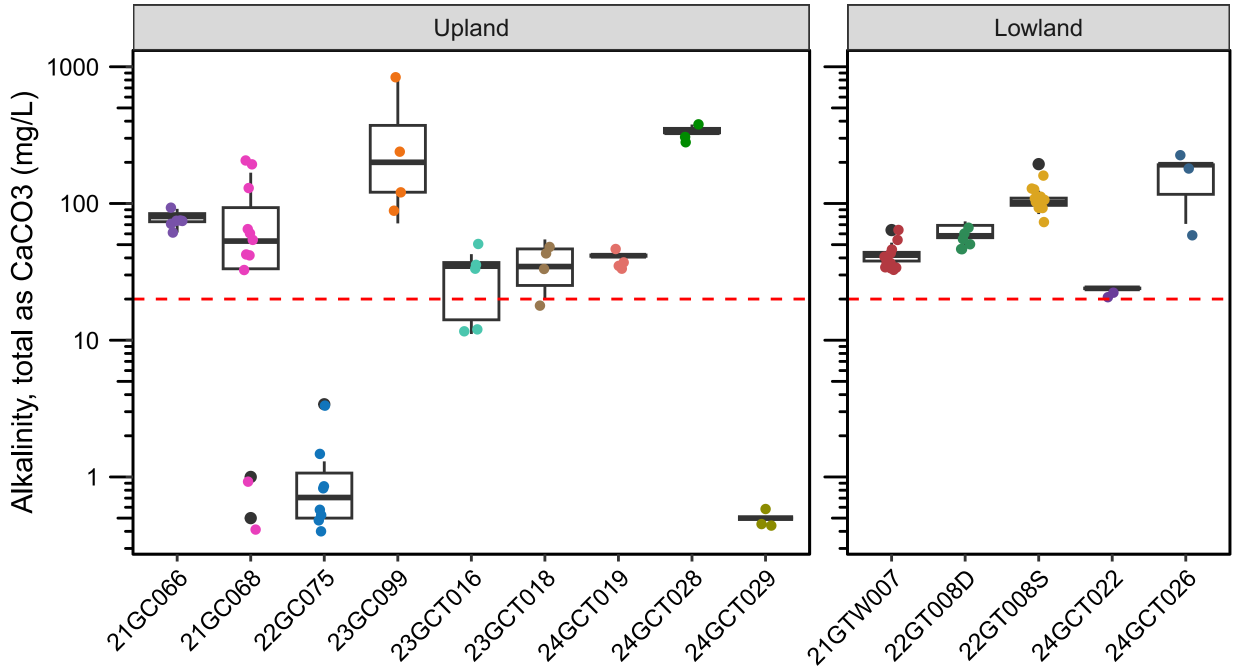

Figure 7. Total alkalinity at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

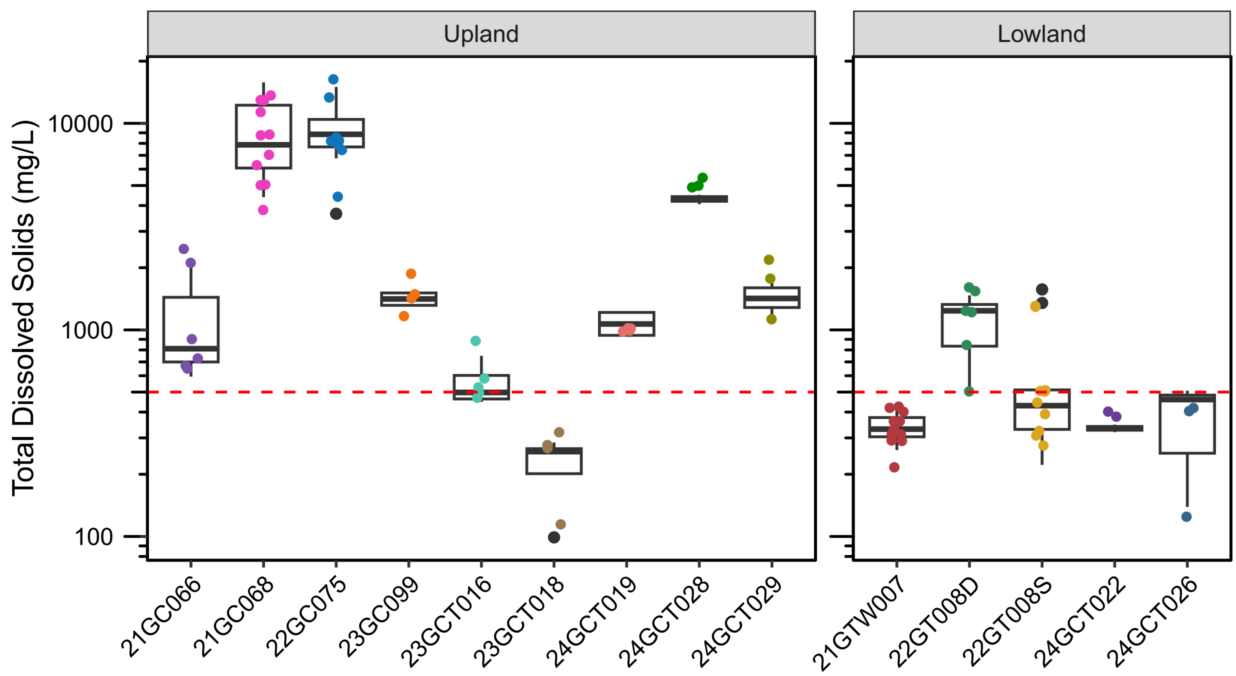

Figure 8. Total dissolved solids (TDS) concentrations at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

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Table 5. Summary of water quality concentrations that exceed Alaska Department of Environmental Conservation (ADEC) water quality standards for groundwater, surface water, and Imuruk Basin sample sites of the Graphite Creek Project survey area near Teller, Alaska, 2014–2025. Hardness-dependent water quality standards are calculated for cadmium, copper, lead, nickel, silver, and zinc. For hardness-dependent criteria, chronic limits are used to evaluate exceedances except for silver, which has no established chronic limit.

	ADEC	Groundwater Upland			Groundwater Lowland			Surface Water			Imuruk Basin		
Analyte	Alaska Water Quality Standards (µg/L)	Exceedances	Total Tests	% Exceeded	Exceedances	Total Tests	% Exceeded	Exceedances	Total Tests	% Exceeded	Exceedances	Total Tests	% Exceeded
Aluminum, total	87	32	48	66.7	12	33	36.4	168	220	76.4	28	32	87.5
Antimony, total	6	0	48	0	0	33	0	0	213	0	0	32	0
Arsenic, total	10	0	48	0	0	33	0	0	220	0	0	32	0
Barium, total	2,000	3	48	6.3	0	33	0	0	220	0	0	32	0
Beryllium, total	4	3	48	6.3	0	33	0	3	220	1.4	0	32	0
Boron, total	750	0	48	0	0	33	0	0	220	0	4	32	12.5
Cadmium, total	calculated[a]	4	48	8.3	0	33	0	117	220	53.2	0	32	0
Chromium, total	100	0	48	0	0	33	0	0	220	0	0	32	0
Cobalt, total	50	25	48	52.1	0	33	0	57	220	25.9	0	32	0
Copper, total	calculated[a]	4	48	8.3	2	33	6.1	34	220	15.5	0	32	0
Iron, total	1,000	33	48	68.8	6	33	18.2	72	220	32.7	5	32	15.6
Lead, total	calculated[a]	0	48	0	0	33	0	3	213	1.4	0	32	0
Lithium, total	2,500	0	38	0	0	25	0	0	163	0	0	24	0
Molybdenum, total	10	4	48	8.3	2	33	6.1	0	220	0	0	32	0
Nickel, total	calculated[a]	26	48	54.2	0	33	0	121	220	55.0	0	32	0
Selenium, total	5	1	48	2.1	0	33	0	2	220	0.9	0	32	0
Silver, total	calculated[a]	0	48	0	0	33	0	0	220	0	0	32	0
Thallium, total	1.7	0	48	0	0	33	0	0	220	0	0	32	0
Uranium, total	30	3	48	6.3	0	33	0	0	141	0	0	32	0
Vanadium, total	100	0	48	0	0	33	0	0	220	0	0	32	0
Zinc, total	calculated[a]	15	48	31.3	0	33	0	30	220	13.6	0	32	0
Cyanide, strong acid dissociable (total)	200	0	48	0	0	33	0	0	174	0	0	32	0
Cyanide, weak acid dissociable	5.2	0	48	0	0	33	0	4	193	2.1	0	32	0
Mercury, total	0.05	0	48	0	0	33	0	0	216	0	0	32	0
Sulfate (as SO4)	250,000	43	48	89.6	8	33	24.2	71	204	34.8	8	32	25.0
Chloride	250,000	0	48	0	0	33	0	0	204	0	17	32	53.1
Fluoride	1,000	18	48	37.5	0	33	0	14	204	6.9	0	32	0
Nitrate (as N)	10,000	0	38	0	0	25	0	0	91	0	0	24	0
Nitrite (as N)	1,000	0	38	0	0	25	0	0	91	0	0	24	0
Nitrate + Nitrite as Total N	10,000	0	10	0	0	8	0	0	128	0	0	8	0
Alkalinity, total (as CaCO3)	20,000 (minimum)	15	48	31.3	0	33	0	117	171	68.4	0	32	0
Solids, total dissolved (TDS)	500,000	41	48	85.4	10	33	30.3	61	219	27.9	20	32	62.5
	Subtotal	270	1,468	18.4	40	1,007	4.0	874	6,365	13.7	82	976	8.4

[a] Alaska Water Quality Standards for these analytes differ depending on total water hardness.

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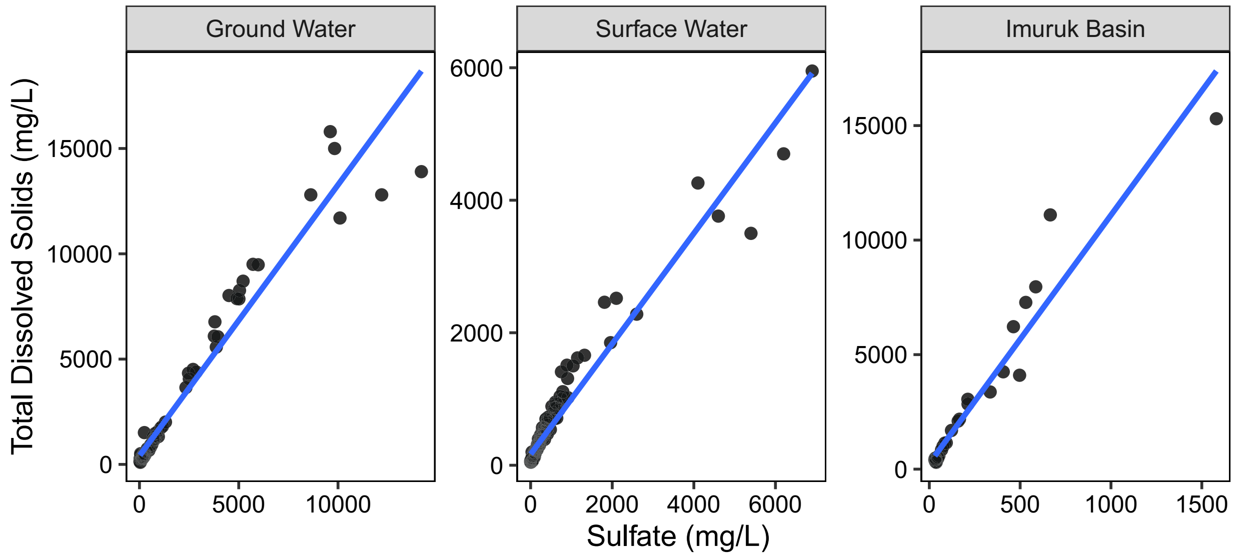

Figure 9. Relationship between total dissolved solids (TDS) and sulfate concentrations for groundwater, surface waters, and Imuruk Basin sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

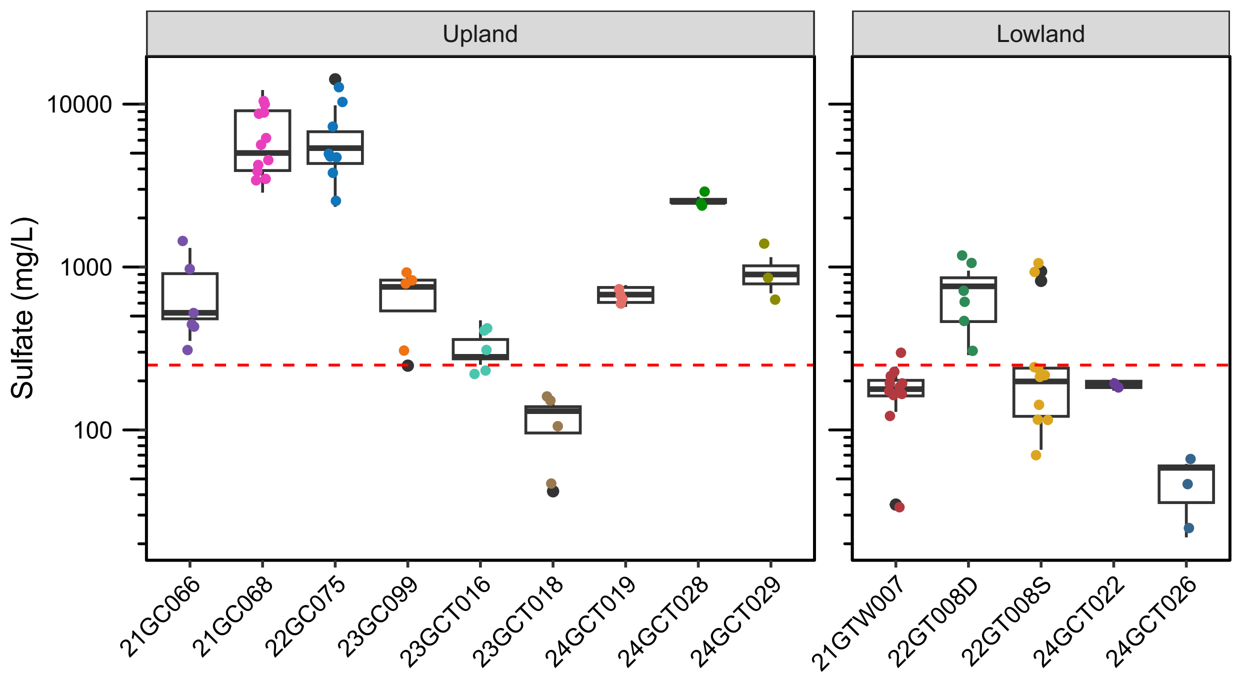

Figure 10. Sulfate concentrations at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

A total of 67% of the samples collected from the upland aquifer exceed the regulatory criteria for aluminum (Table 5). The regulatory limit for aluminum is 0.087 mg/L. Aluminum concentrations in the upland aquifer are highly variable, typically ranging from 0.009 to 10 mg/L (Figure 11). One location (well 24GCT029), in the perched aquifer, is distinct with several measurements of concentration over 30 mg/L aluminum (Appendix A).

The upland aquifer often has elevated iron content with 69% of the samples collected to date exceeding the regulatory limit of 1 mg/L (Table 5). Iron concentrations fall into three groups. The lower group has iron concentrations ranging from 0.03 to 3 mg/L (Figure 12). A second group has iron concentrations ranging from 40 to 100 mg/L. The third group has iron concentration ranging from 700 to 2000 mg/L. The two higher groups are in the central part of the proposed pit.

Other metals seen in the upland aquifer at levels exceeding the regulatory standards include nickel (55% of samples), cobalt (51%), and zinc (31%) (Figure 13; Table 5). Other metals with fewer exceedances include cadmium (8%), copper (8%), and uranium (6%).

Non-metals that may be mobile in acidic environments are also seen including fluoride (37%) and beryllium (6%) (Table 5). Selenium exceeds regulatory standards in one sample. Barium, which is generally found in barite and therefore typically non-mobile, exceeds the regulatory standards in 6% of samples.

3.2.2 LOWLANDS

The Kigluaik Fault is at the mountain front and separates the upland aquifer to the south from the lowland aquifer to the north. Downgradient from the proposed pit, the lowlands are dominantly comprised of glacio-fluvial and fluvial sediment. Glacial till is located on the eastern side of the project area (Figure 2). All the monitoring wells (sample locations) are located downgradient of the proposed pit in the glacio-fluvial and fluvial sediment.

The lowland groundwater is monitored at four locations (wells 21GTW007, 22GT008, 24GCT022, and 24GCT026) with one of these locations monitored at two depths (22GT008S and 22GT008D referring to shallow [S] and deep [D]) (Figure 2; Table 2). The sample locations range from 700 m to 1600 m from the Kigluaik Fault with the exception of the 22GT008 which is located less than 200 m from the surface trace of the fault and directly above it (the fault dips to the north under the location of the well). This location (22GT008) will be referred to as "proximal" in the following sections. The rest of the locations will be considered "distal". Proximal and distal refer to the relative distance from the upland aquifer and the assumed origin of most constituents of concern.

Water type

The lowland groundwater is generally similar to the upland water and is a calcium-magnesium sulfate water type (Figure 5). Interestingly, the most distal location water is a mixed type with a chloride component not seen elsewhere in the project area.

Temperature

Lowland groundwater temperatures are in the 2–4 ^{o}C range (Appendix B). The shallow proximal location shows a wider range of temperatures, reaching as high as 8 ^{o}C, presumably due to meteoric water influence.

pH and alkalinity

The lowland groundwater is slightly acidic to slightly basic with a typical pH range of 6.1 to 8.0 (Figure 6, Appendix B). The most distal well (24GCT026) is distinctive with a basic pH range of 10.8 to 11.8.

Alkalinity varies between the sampled locations but is consistently above regulatory standards (regulatory standard is a minimum of 20 mg/L) (Figure 7; Appendix A). The majority of locations have an alkalinity range of 40 to 190 mg/L. The most upgradient of the distal wells (well 24GCT022) is distinctive with an alkalinity of 24 mg/L. The most distal well (24GCT026, very high pH) is at the upper end of typically observed alkalinity range.

The proximal water samples have unremarkable pH and alkalinity, in contrast to the water on the other side of the fault.

Total dissolved solids and sulfate

The lowland groundwater has moderately high TDS levels that exceed regulatory criteria of 500 mg/L in 30% of samples (Figure 8; Table 5).

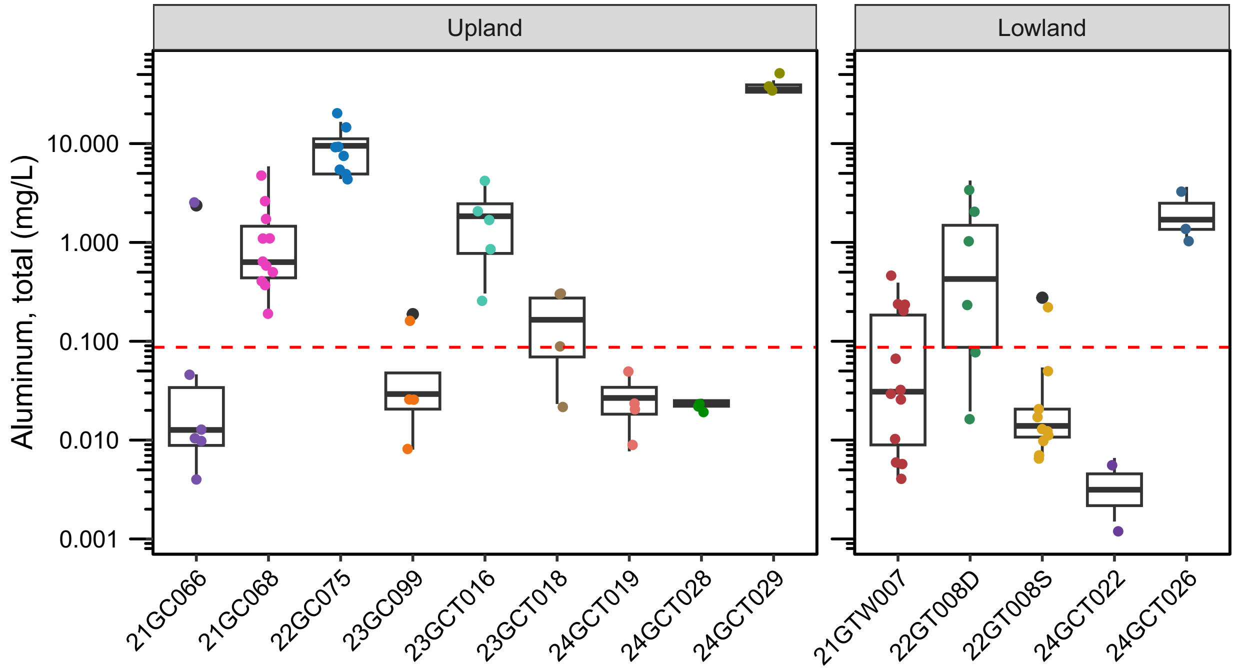

Figure 11. Total aluminum concentrations at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

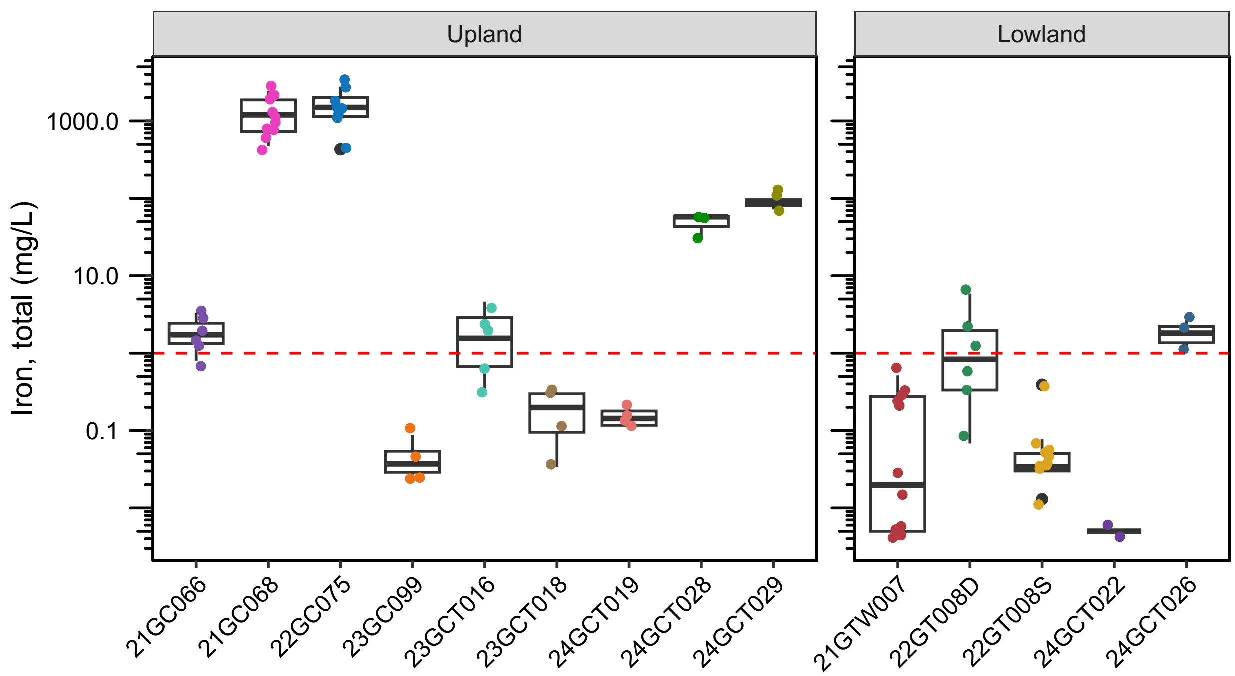

Figure 12. Total iron concentrations at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

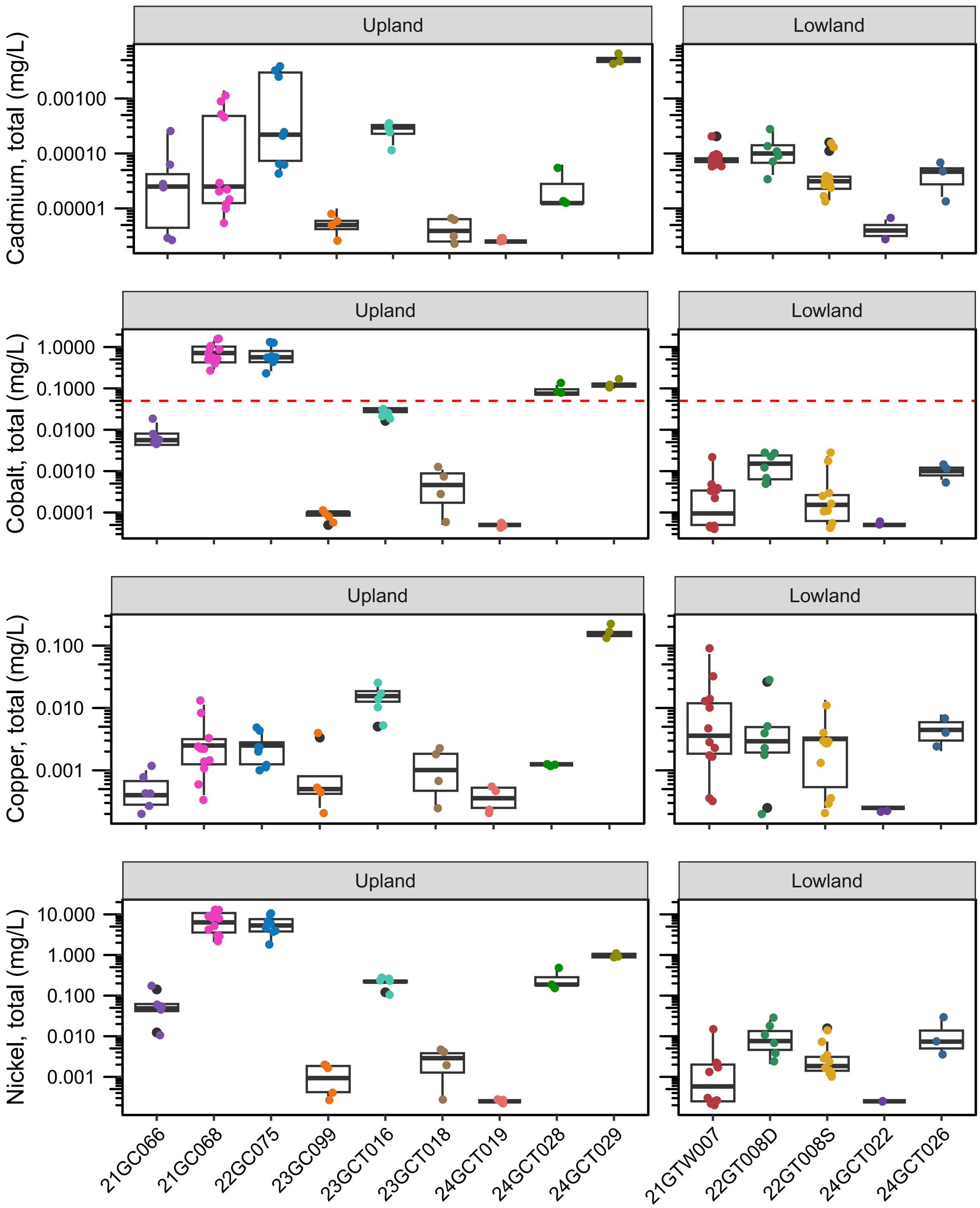

Figure 13. Total cadmium, cobalt, copper, and nickel concentrations at upland and lowland groundwater sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2021–2025.

The TDS concentration is generally between 250 and 500 mg/L. The exception is the proximal sample location. The shallow location (well 22GT008S) initially had high TDS levels during 2022 sampling, but TDS concentrations have steadily dropped and are now below regulatory limits as of the beginning of 2025. The deep location of the pair (22GT008D) is distinctive and consistently exceeds the regulatory limit with the TDS level ranging from 850 to 1100 mg/L (Figure 8). However, this is considerably lower than the TDS seen immediately on the other side of the Kigluaik Fault.

Sulfate levels correlated with TDS for most lowland wells with the exception of the distal well (24GT026) (Figure 9). The majority of locations have moderate sulfate concentrations ranging from 100 to 250 mg/L. Similar to TDS, the sulfate content at the deep proximal location (22GT008D) is distinct, ranging from 45 to 850 mg/L. All samples that exceed the sulfate criteria (24%) (Table 5) were seen at the proximal location (double well site 22GT008S and 22GT008D). The most distal well (24GCT026) is also distinctive with relatively low sulfate levels ranging from 40 to 60 mg/L (Figure 10).

Metals

Other metal exceedances are rare in the lowland groundwater. A total of 6% of the samples had copper and 6% of the samples had molybdenum concentrations that exceed regulatory criteria (2 samples each) (Table 5).

3.3 SURFACE WATER QUALITY

Water quality is monitored in seven streams (Figure 3). The Cobblestone River, to the east is much larger than the other creeks and drains a substantial portion of the interior of the Kigluaik Mountains. The majority of the other sampled streams either drain the proposed mine area or terrain to the west with similar mineralization. There are two unnamed streams between the project area and the Cobblestone River that drain areas with glacial till deposits but may be influenced by the mineralized rocks.

Information in the following surface water quality sections is from ERM 2020; Forster and Seigle 2024a; Forster and Seigle 2024b). The 2025 field survey results are reported in this document; there is no stand-alone 2025 field survey report.

3.3.1 COBBLESTONE RIVER

The Cobblestone River is sampled at two locations that are approximately 1000 and 1500 m north of the mountain front (Figure 3).

Water type

The water is a non-distinct or mixed water type that dominantly has calcium and magnesium major cations, and sulfate and carbonate/ bicarbonate major anions (Figure 14).

Temperature and dissolved oxygen

The Cobblestone is a medium sized subarctic stream with a thick ice cover in the winter. Larger pools do not completely freeze. Summer temperatures are typically about 6^{o} C, reaching a typical high of 10–12 ^{o} C in late July or early August (Appendix C). The DO normally varies between 12 and 14 mg/L.

Turbidity and total suspended solids

The Cobblestone River (sites CO1 and CO2) is a clear river with a turbidity ranging from 0.6 to 1.6 NTU but sometimes reaching 10 NTU or higher during storm events (Figure 15). Suspended solids are also low, typically ranging from 1 to 2.5 mg/L (Figure 16).

pH and alkalinity

The pH of the Cobblestone River is circumneutral and the alkalinity is low, typically in the range of 25 to 38 mg/L (regulatory minimum is 20 mg/L) (Figures 17 and 18).

Total dissolved solids and sulfate

Dissolved solids are low typically ranging from 60 to 130 mg/L (Figure 19). Sulfate is also low, typically in the range of 17 to 40 mg/L (Figure 20).

Metals

Aluminum concentrations are elevated, but usually below regulatory limits (typical range of 0.016 to 0.08 mg/L, regulatory limit of 0.087 mg/L) (Figure 21). The aluminum content in the Cobblestone River slightly exceeds the regulatory limits about 5% of the time (Table 5). Iron concentrations are slightly elevated as well, typically ranging from 0.03 to 0.2 mg/L (regulatory

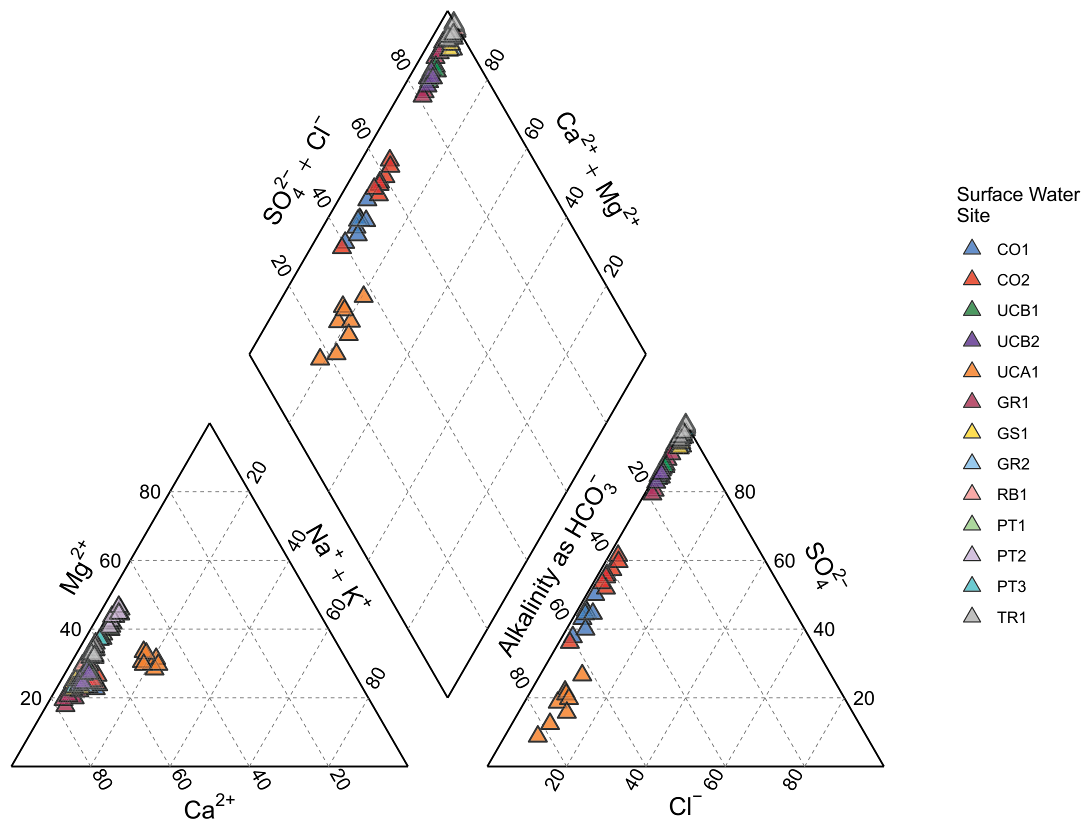

Figure 14. Piper Diagrams for surface waters of the Graphite Creek Project water quality survey area near Teller, Alaska 2023–2025. Piper diagram does not include legacy data 2014–2022.

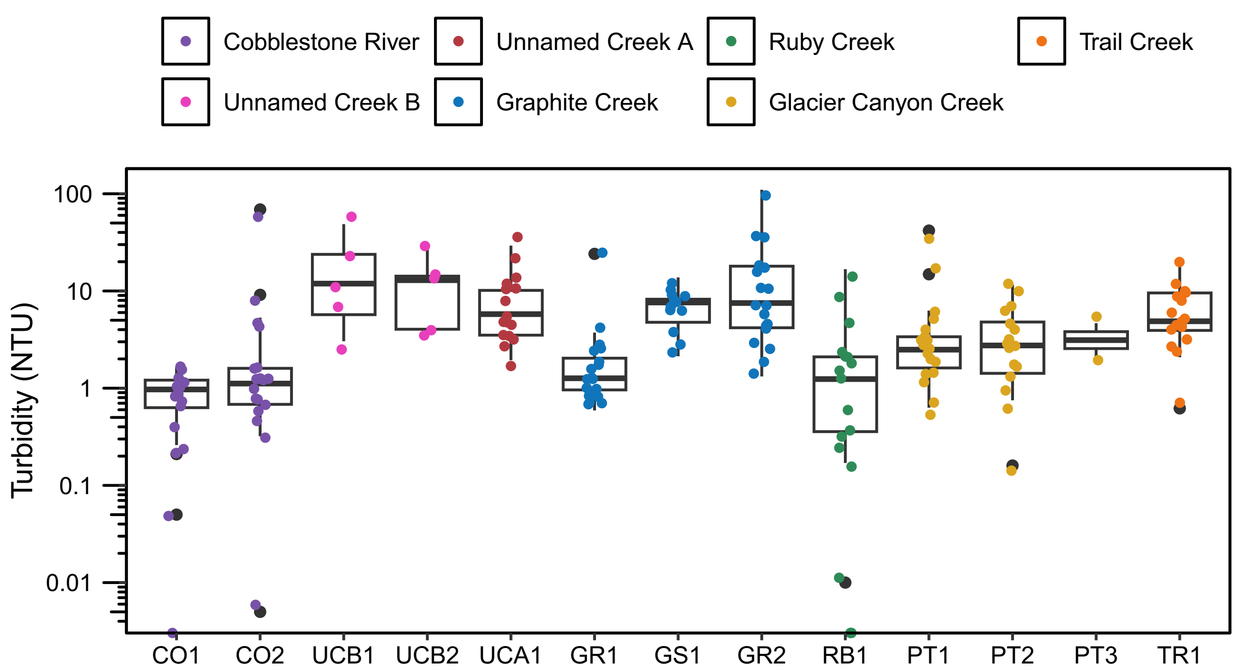

Figure 15. Ambient *in situ* turbidity (NTU) measured at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

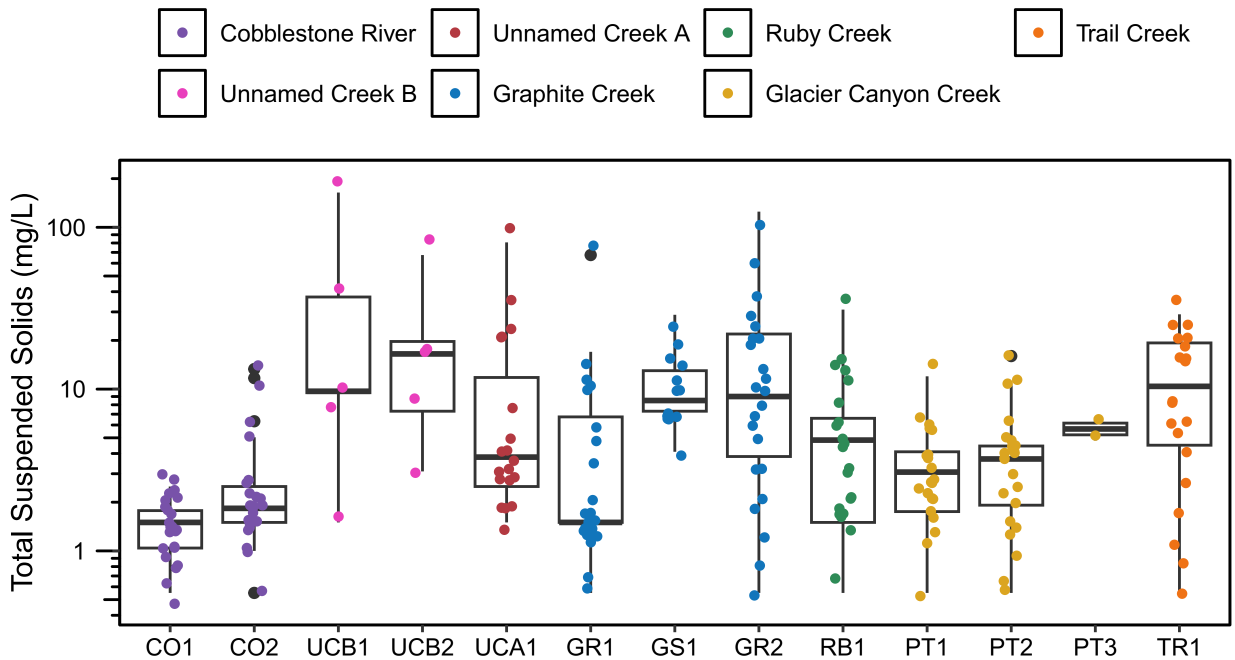

Figure 16. Total suspended solids (TSS) concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

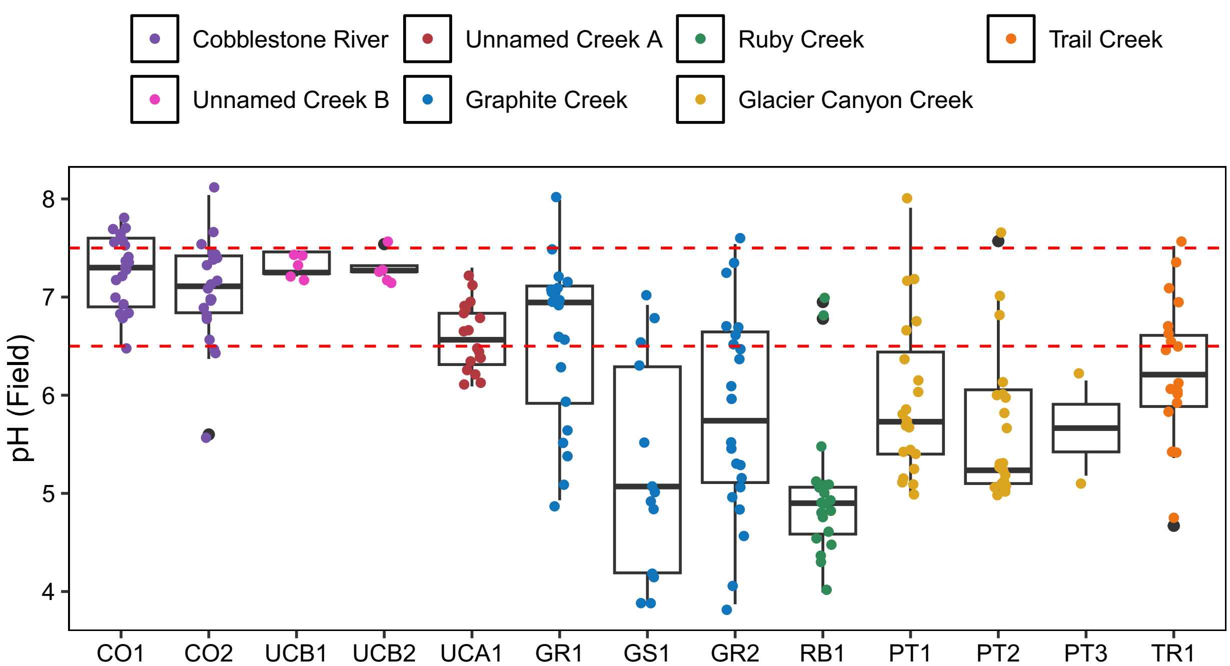

Figure 17. Ambient *in situ* pH measured at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

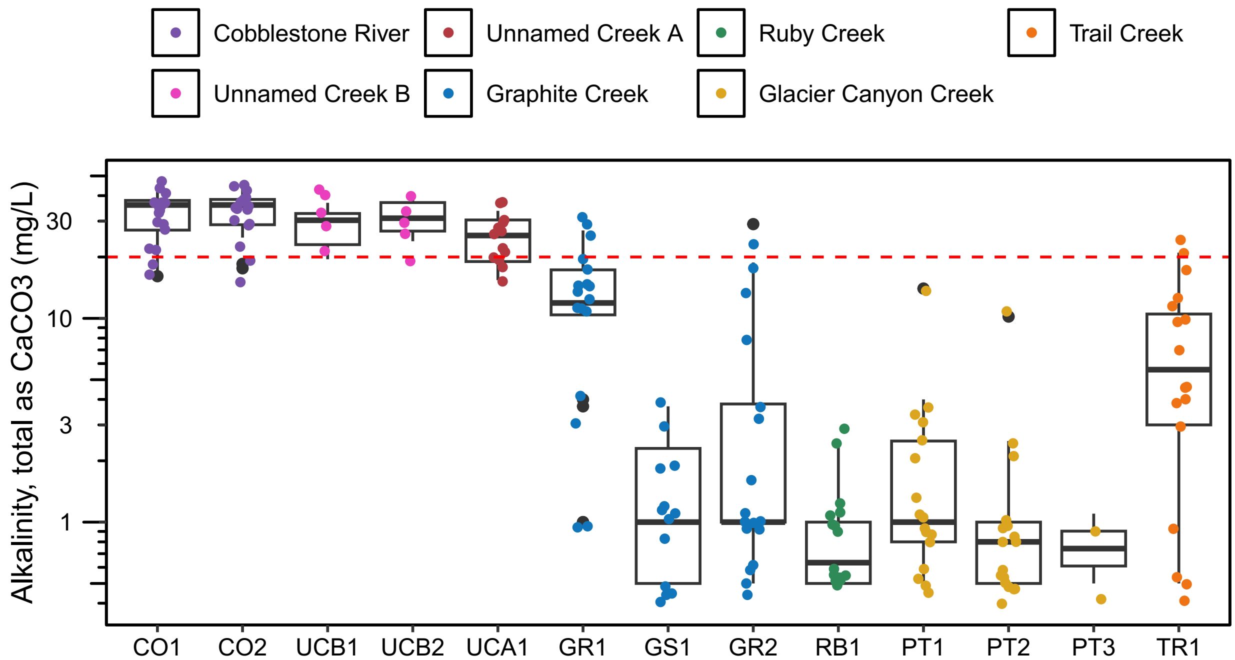

Figure 18. Total alkalinity concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

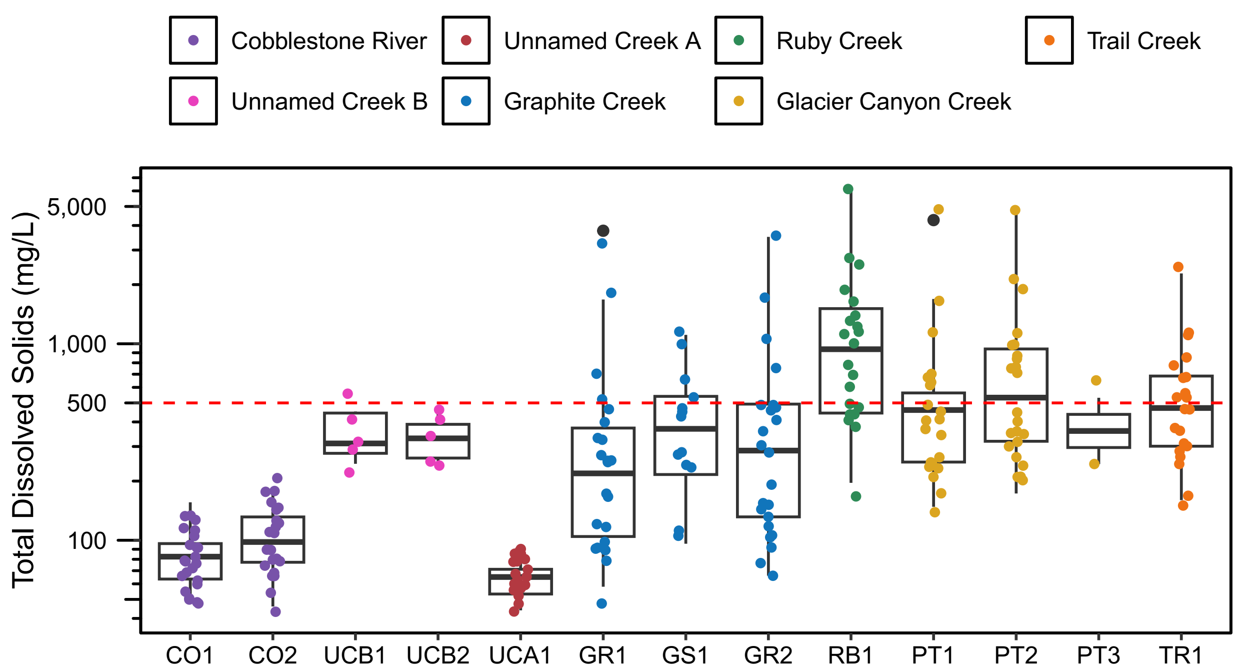

Figure 19. Total dissolved solids (TDS) concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

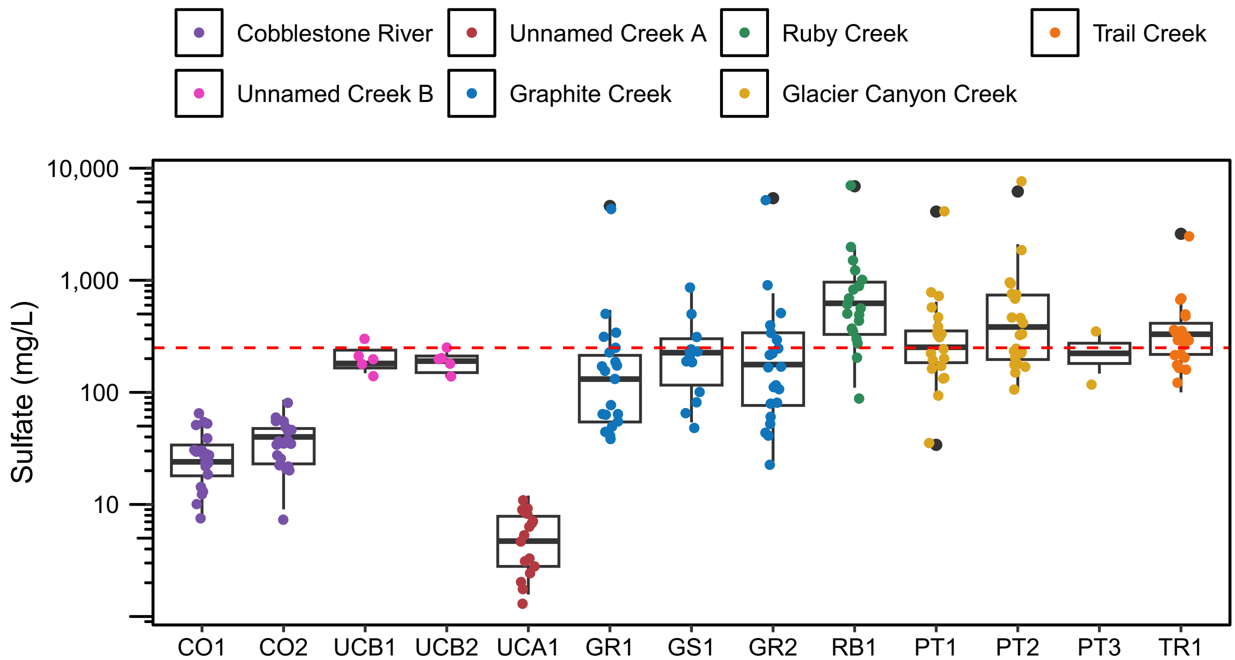

Figure 20. Sulfate concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

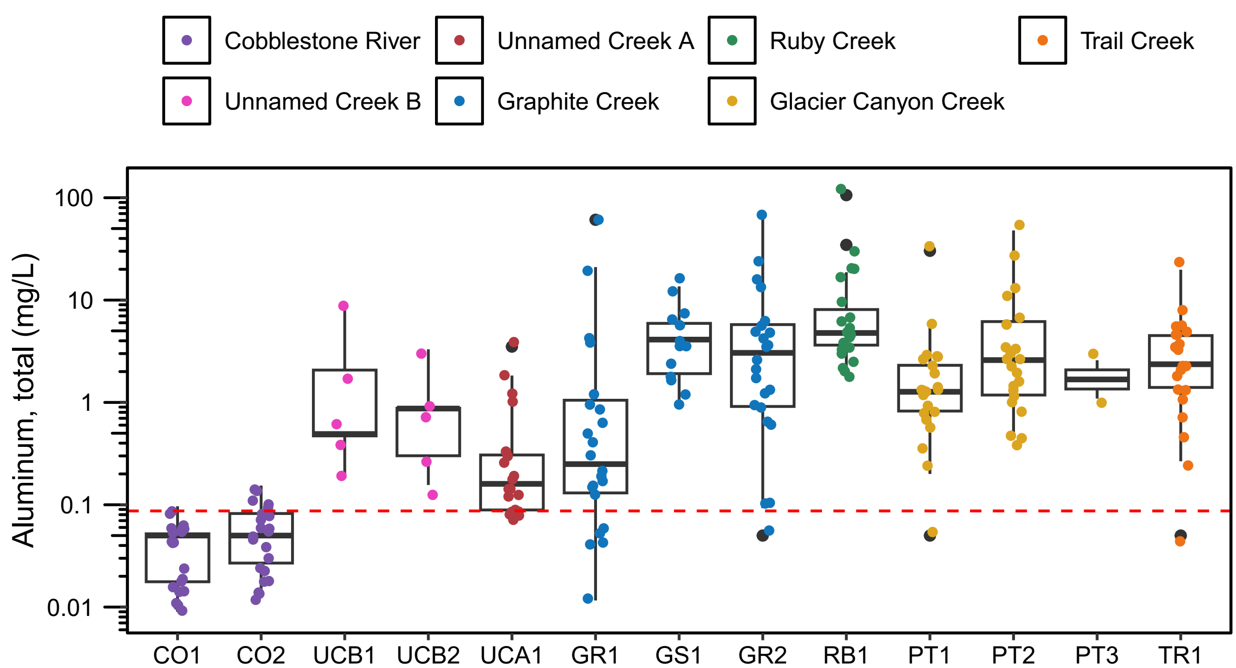

Figure 21. Total aluminum concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

limit of 1 mg/L) (Figure 22). Other metal concentrations are low (Figure 23, Appendix A).

The elevated aluminum and iron likely are related to streams in the Kigluaik Mountains that have iron and aluminum precipitating environments (personal communication, S. Rowland).

Nutrients and volatile organic compounds

Nutrient concentrations in the Cobblestone River are low. Nitrate, nitrite, and total phosphorus are typically below detection limits or below 0.01 mg/L (Appendix A). Ammonia concentrations are also minimal. These values indicate a lack of nutrient enrichment and are consistent with cold, oligotrophic headwater systems in undisturbed arctic environments.

Volatile organic compounds (VOCs) were analyzed in 2019 (ERM 2020). They are typically a result of anthropogenic sources. No VOCs were detected in Cobblestone River samples.

3.3.2 DEPOSIT AREA STREAMS

Surface water quality within the deposit area reflects the combined influence of steep terrain, shallow soils, naturally mineralized bedrock, and strong seasonal shifts in hydrology. The four principal streams—Graphite, Ruby, Glacier Canyon (formerly Ptarmigan), and Trail creeks—originate in upland catchments and flow over bedrock before crossing into the lowlands and eventually draining into the Imuruk Basin. Trail Creek and Glacier Canyon Creek discharge directly into Imuruk Basin. Graphite Creek and Ruby Creek are tributaries to Glacier Canyon Creek. These streams have similar geochemical traits, but some variation. Conditions are dynamic, driven by transitions between snowmelt-dominated runoff during early summer and baseflow during mid-summer and storm runoff in the late summer. Graphite Creek and Ruby Creek drain the proposed pit, and Glacier Canyon Creek is immediately adjacent to the proposed pit on the west. Trail Creek is further west but has similar geochemistry to other streams in the deposit area.

These streams are characterized by precipitates that are indicative of acid rock drainage (ARD) conditions. The upper reaches in the uplands have a white aluminum sulfate precipitate (USGS, personal communication). Near

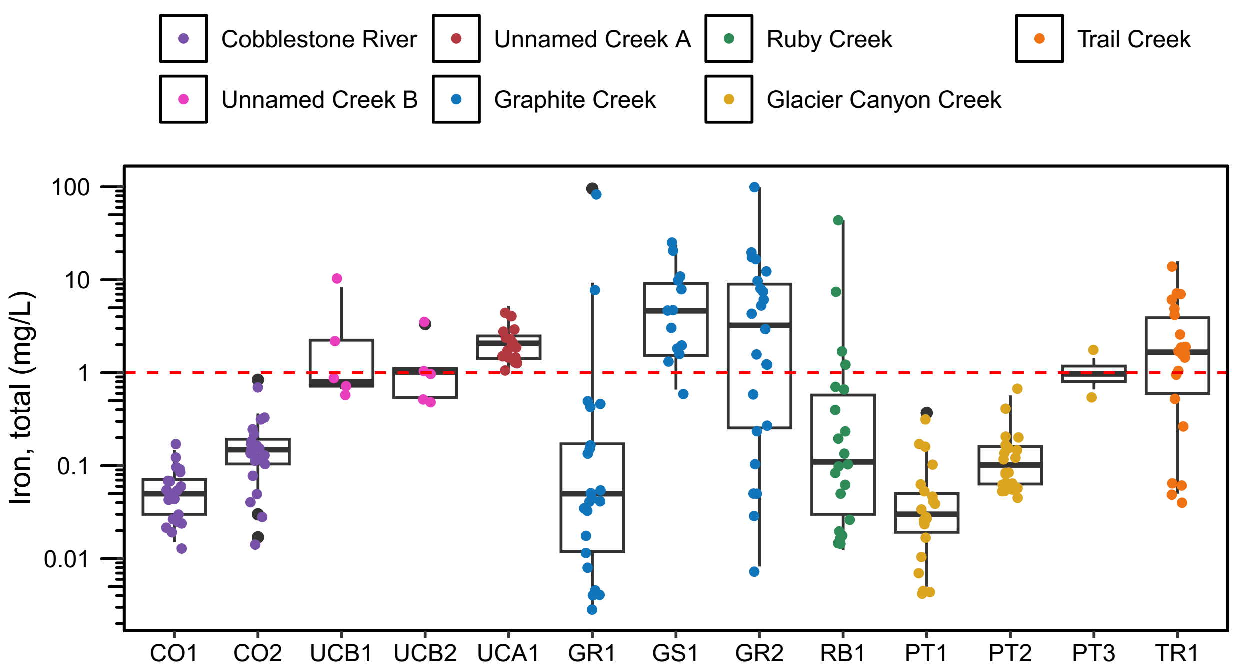

Figure 22. Total iron concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

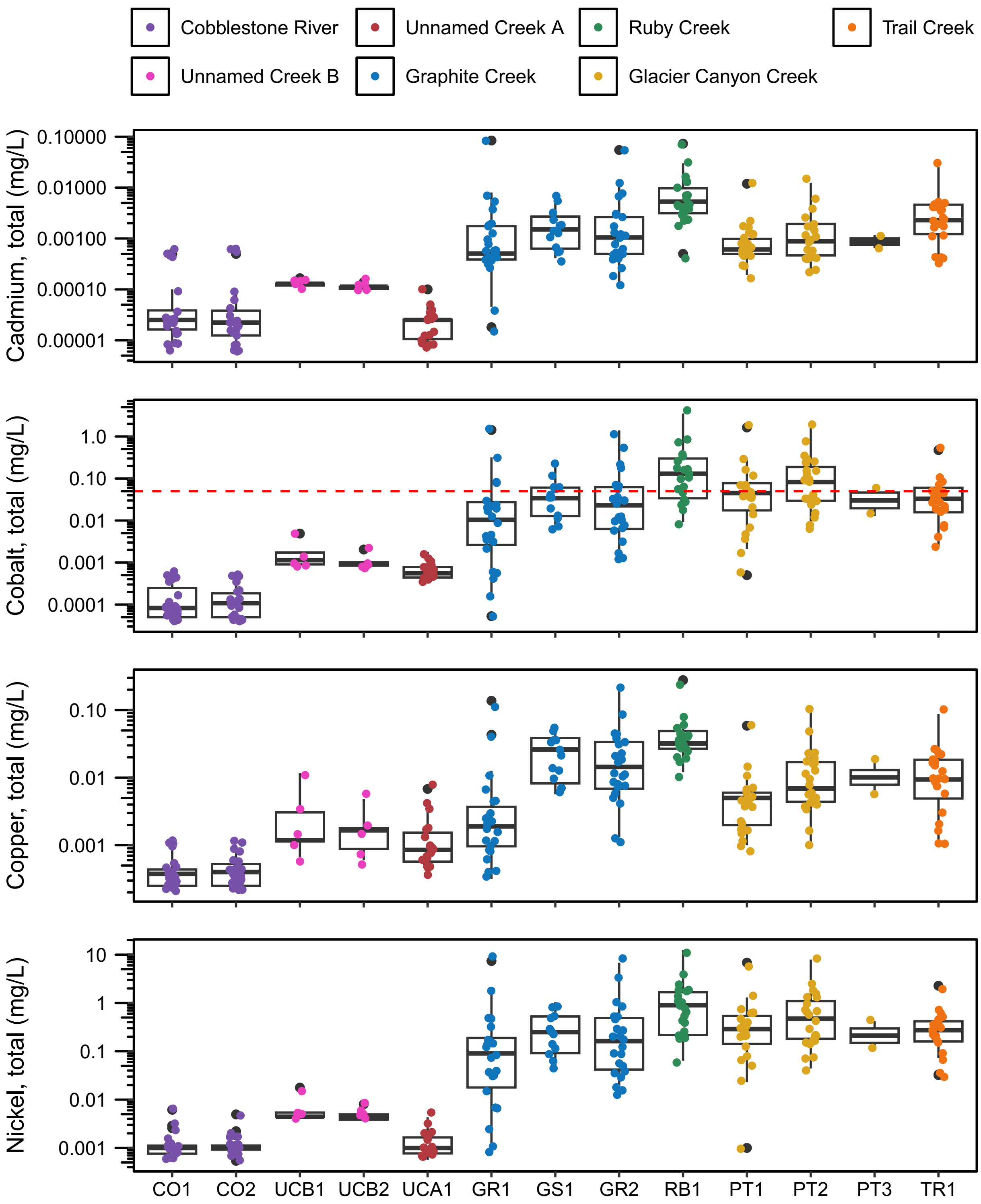

Figure 23. Total cadmium, cobalt, copper, and nickel concentrations at surface water sampling sites of the Graphite Creek Project water quality survey area near Teller, Alaska, 2014–2025.

the mountain front, the precipitate transitions to rust colored iron oxides.

Water type

The deposit drainages have a calcium sulfate water type, strongly influenced by the high sulfate content (Figure 14). In this type of water, strong acids exceed week acids. This is a typical water type in acid rock drainage environments.

Temperature and dissolved oxygen

These are typical subarctic streams in that they are frozen in the winter, break-up in late May or June and start freezing again in October. They are likely (mostly) frozen in the winter with base flow that finds its way both above the stream bed and in the hyporheic zone.

Summer temperatures typically range from 1–6 ^{o}C, rarely reaching 10 ^{o}C (Appendix C). The DO levels are slightly higher than for the Cobblestone River, typically ranging from 13 to 15 mg/L and occasionally reaching 18 mg/L. The DO in Glacier Canyon Creek, below the Graphite Creek confluence is lower, in the 12 to 13 mg/L range.

Turbidity and total suspended solids

The turbidity of the deposit area streams is higher than the Cobblestone River but still low with a range of 0.3 to 15 NTU (Figure 15). Graphite and Glacier Canyon creeks show a slight increase in turbidity in the downstream direction.

Suspended solids have a similar pattern, though the lower Glacier Canyon Creek location does not stand out (Figure 16). The TSS for these streams typically ranges from 2 to 20 mg/L.

pH and alkalinity

The deposit area streams are acidic and have very low alkalinity. The pH of these streams typically ranges from 4 to 7 with the pH of each reach of a stream typically varying over a range of one to two pH units (Figure 17, Appendix C). Ruby Creek is distinctive with a typical pH range of 4.5 to 5. Upper Graphite Creek (in the uplands) is the opposite with a typical range between 6 and 7.

All deposit area streams have alkalinity levels that are below the regulatory standard (the standard is not below 20 mg/L) (Figure 18). Except for upper Graphite Creek and Trail Creek, the alkalinity typically ranges from 0.5 to 3 mg/L. Upper Graphite Creek and Trail Creek are distinctly higher with typical ranges of 10 to 20 mg/L and 3 to 10 mg/L respectively, but still below the criteria.

Total dissolved solids and sulfate

The deposit area streams have TDS levels that fall into three groups. Glacier Canyon Creek and Trail Creek typically range between 300 and 800 mg/L (Figure 19). Ruby Creek is higher, typically ranging between 450 and 1500 mg/L. The TDS levels in Graphite Creek typically range from 100 to 550 mg/L. The deposit area streams have TDS levels exceeding the regulatory limit of 500 mg/L in 28% of the samples (Table 5).

The sulfate content has a pattern similar to that of TDS. Sulfate is above the regulatory standard of 250 mg/L in approximately 34% of the samples (Table 5). Sulfate concentrations typically range from 60 to 800 mg/L (Figure 20).

Metals

The deposit area streams generally have high metal contents (Appendix A).

Aluminum is above the 0.087 mg/L criteria with few exceptions (Figure 21). Most of the deposit area streams have aluminum concentrations that typically range from 1 to 8 mg/L. The exception is upper Graphite Creek with a typical range of 0.15 to 1 mg/L. Aluminum exceeds regulatory standards in approximately 76% of samples (Table 5).

Iron concentrations are much more variable. About half the stream reaches (upper Graphite, Ruby, upper and mid Glacier Canyon) have iron concentrations typically ranging from 0.02 to 0.5 mg/L, rarely exceeding the regulatory criteria of 1 mg/L (Figure 22). The other half of the stream reaches (mid and lower Graphite, lower Glacier Canyon, Trail) have iron concentrations typically ranging from 0.3 to 10 mg/L. The upland portions of Graphite and Glacier Canyon Creek have lower concentrations than in the lower reaches of these creeks, but there is no consistent trend in the downstream reaches. Approximately 30% of the samples exceed the regulatory criteria (Table 5).

Nickel and Cadmium exceed regulatory criteria in 55% and 53% of samples from deposit area streams, respectively (Table 5). Typical cadmium concentrations range from 0.0004 to 0.01

mg/L (Figure 23). Nickel has a typical range in deposit area streams of 0.02 to 1 mg/L.

Other metals that exceed regulatory criteria are cobalt (26%), copper (16%), and zinc (14%). Lead exceeds regulatory criteria in 3 samples (1.4%) (Table 5, Figure 23). These metals are often leached in acidic environments (Downing et al., 2014).

Non-metals that may be mobile in acidic environments are also seen, including fluoride which exceeds regulatory criteria in 7% of samples and beryllium (3 samples, 1.4% exceedance) (Table 5).

Selenium exceeds regulatory standards in two samples (0.9%).

Weak acid dissociable cyanide exceeded regulatory criteria in 4 samples (2%). There has been no known human use of cyanide in the area. The WAD cyanide is likely from biologic sources (Botz et al., 2016).

Nutrients and volatile organic compounds

Nutrient concentrations are low throughout the proposed mine area. Nitrate, nitrite, and ammonia are consistently below AWQS thresholds (Table 5, Appendix A) and do not vary substantially by season or location. Total phosphorus is also minimal, typically below 0.05 mg/L in all samples. These low nutrient levels are consistent with cold, oligotrophic headwaters systems.

VOCs were included in the analytical suite during the 2019 baseline study (ERM 2020). No target compounds were detected above method detection limits. The absence of VOCs in these samples confirms that hydrocarbon contamination is not present under baseline conditions, as expected for an undeveloped and roadless watershed.

3.3.3 UNNAMED CREEKS AREA

Two unnamed tributaries to the Cobblestone River are monitored between the proposed mine area and the river (Figure 3). Creek A drains a low saddle through which the proposed access road would pass, and the access road would cross Creek B. Most of the Creek A drainage is composed of glacial till, but a small part of the drainage includes potentially mineralized upland. The majority of Creek B drainage is uplands in nature and includes a potential extension of the mineralized rock. A substantial part of the surface in the Creek B drainage is covered by glacial till.

These drainages have characteristics that are generally intermediate between Cobblestone River characteristics and deposit area stream characteristics. These characteristics are not consistent, however, with each creek sometimes showing characteristics closer to one end member or the other.

Water type

Creek A has a calcium bi-carbonate water type which is distinctly different from the other creeks in the project area (Figure 14). Creek B has the same type of water as the streams in the deposit area– calcium sulfate.

Temperature and dissolved oxygen

The temperature of these creeks is in the 4–6 ^{o}C range during the summer, similar to the Cobblestone River (Appendix C). The DO is similar to the other streams. However, Creek A has the lowest DO in the study area, typically ranging from 10 to 12 mg/L.

Turbidity and total suspended solids

The two drainages have similar turbidity, but different TSS. The turbidity is typically in the 4 to 20 NTU range (Figure 15). The TSS of Creek A is typically low (4 to 6 mg/L), lowest in the study area (Figure 16). The TSS of Creek B is similar to the deposit area streams.

pH and alkalinity

Both Creek A and Creek B have pH values in the circumneutral range (Figure 17, Appendix C). Both creeks have low alkalinity (but above regulatory criteria) similar to the Cobblestone River (Figure 18). The alkalinity levels suggest that there is sufficient alkalinity to buffer acid generation that may be happening in these drainages.

Total dissolved solids and sulfate

Total dissolved solids and sulfate levels in both drainages are below regulatory criteria (Figures 19 and 20). TDS and sulfate in Creek A are low, similar to waters in the Cobblestone River. Creek B is similar to the deposit area streams with moderate TDS and sulfate levels (but without the higher values that are sometimes seen in the deposit area streams).

Metals

Aluminum concentrations in both creeks are above regulatory standards, but intermediate between the Cobblestone River and the deposit area creeks (Figure 21). Iron concentrations in both creeks are similar to the deposit area creeks (though deposit area creeks show a much larger range of concentrations) (Figure 22). The median iron concentrations are very close to the regulatory limit with over half of the samples exceeding the limit (Table 5).

Cadmium concentrations in these creeks do not exceed regulatory limits (Table 5). Cadmium in Creek A is low, similar to the Cobblestone River (Figure 23). Cadmium concentrations in Creek B are also low, but intermediate between that of the Cobblestone River and the deposit area streams. Nickel also shows no exceedances (Table 5) in these creeks with similar patterns relative to the other streams (Figure 23).

Concentrations of other minerals are below regulatory standards in both creeks (Figure 23). The concentrations tend to be intermediate between those of the Cobblestone River and those of the deposit area creeks.

3.4 IMURUK BASIN

The Imuruk Basin is a large slightly brackish tidal lake. It has a mean tidal range of 0.35 feet (NOAA 2024). Water discharging from the Imuruk Basin flows through the Tuksuk Channel to Grantley Harbor and then to Port Clarence on the Bering Sea. The Tuksuk Channel has large flow rates that are strongly tidally influenced and may reverse flow direction during certain tidal conditions (Brailey and Tundra, 2025). The Imuruk Basin receives inflow from rivers that drain much of the interior of the Seward Peninsula including the Agiapuk, Kaviruk, Kuzitrin, and Cobblestone rivers. The deposit area streams (Graphite, Glacier Canyon, and Trail creeks) discharge into the south side of the basin.

The basin has an area of approximately 90 square miles, a length of 17 miles, and a shallow depth. Except near the outlet, the basin is 10 to 15 feet deep with a flat bottom. The Tuksuk Channel is at least 60 feet deep. The channel bottom extends a short distance into the basin at a depth of 20 to 25 feet. Basin waters are thought to be well mixed by wind and waves related to the large surface area and shallow nature of the basin, though daily intrusion of saline waters to the basin may result in denser brackish waters at depth in some portions of the basin.

Water type, salinity, and stratification

The Imuruk Basin water is slightly brackish to fresh water (brackish water is 0.5 to 30 parts per thousand, ppt) (Figure 24, Appendix D). The median salinity in the summer months is 0.50 ppt which is at the fresh/brackish water transition. In June, the basin is predominantly freshwater with a median salinity of 0.35 ppt. The July median rises to 0.49 ppt. In August, the median salinity again rises to 1.36 ppt. The September median salinity drops to 0.81 ppt. This pattern is thought to be due to snowmelt runoff in the early summer, relatively low precipitation in mid to late summer, and then input from fall storms. Brackish conditions likely exist during the winter when the basin is continuously ice covered and precipitation input ceases.

Saline water intrusion occurs in the basin during high tides. Saline water is denser than fresh water, therefore it typically enters as a layer at the bottom. Higher salinity is often seen near the outlet at depth, often seen as a sharp increase at a depth of 12 to 13 feet, below which the salinity often reaches 8 to 10 ppt (Figure 24, Appendix D).

The largest quantities of freshwater enter the basin from the north, east, and southeast. Some weak stratification of freshwater over brackish water is seen in samples collected in the eastern end of the basin in September (Figure 24, Appendix D) (Forster and Seigle, 2024a and 2024b).

The mixing of saline and freshwater in the basin can be seen in the Piper diagram shown in Figure 25. Samples from two depths at two locations are shown. Site IM02 is near the basin outlet, in the channel near the basin outlet, and site IM07a is located approximately mid-basin on the south side (Figure 4). Water from site IM02 plots all the way to the right in the sodium chloride field (i.e., saline water) (Figure 25). Most of the deep samples from this site are the furthest to the right (most saline). The samples form a linear trend

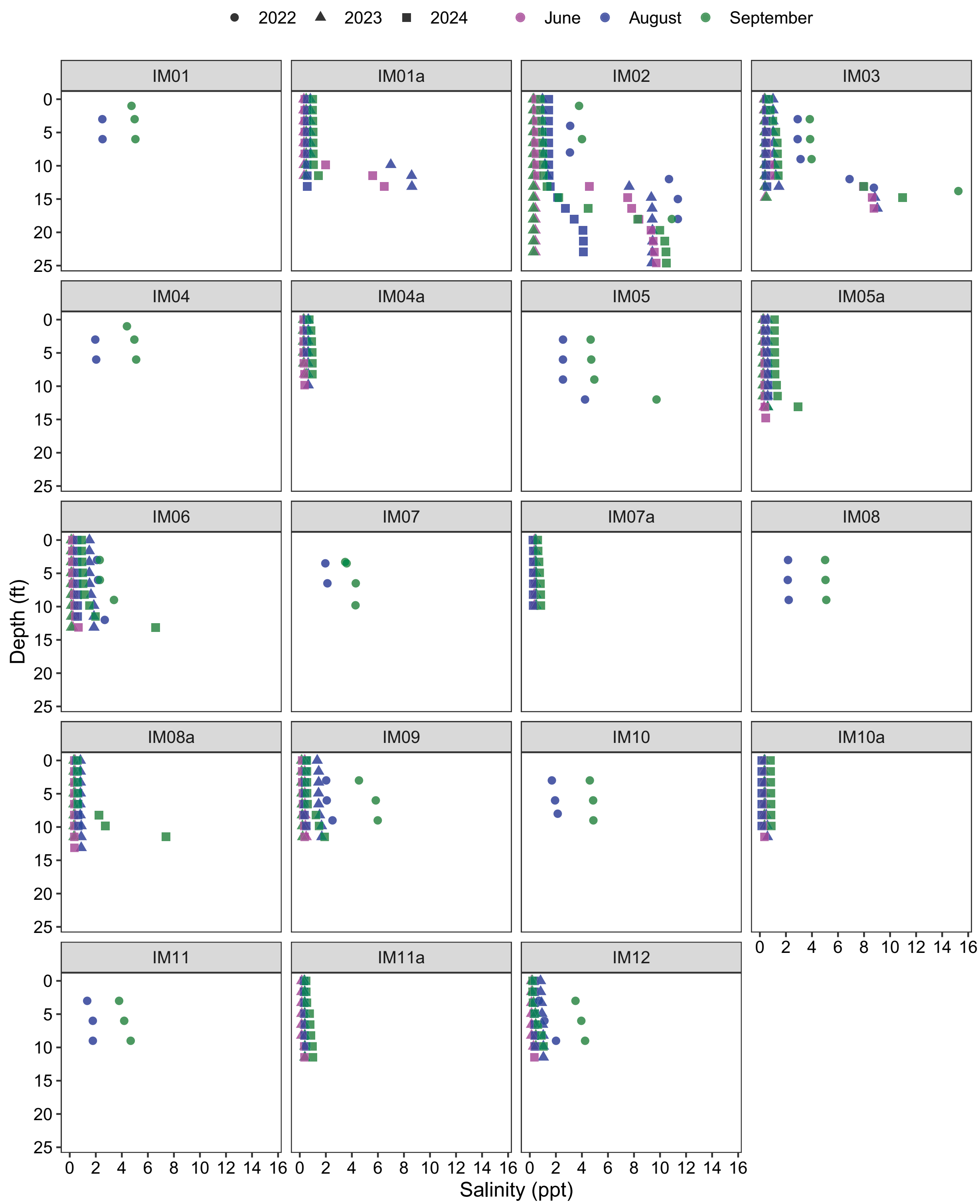

Figure 24. Salinity-depth profiles for sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, June, August, and September 2022–2024. Salinity values for 2022 were not directly measured in the field. These values were calculated from field temperature and conductivity.

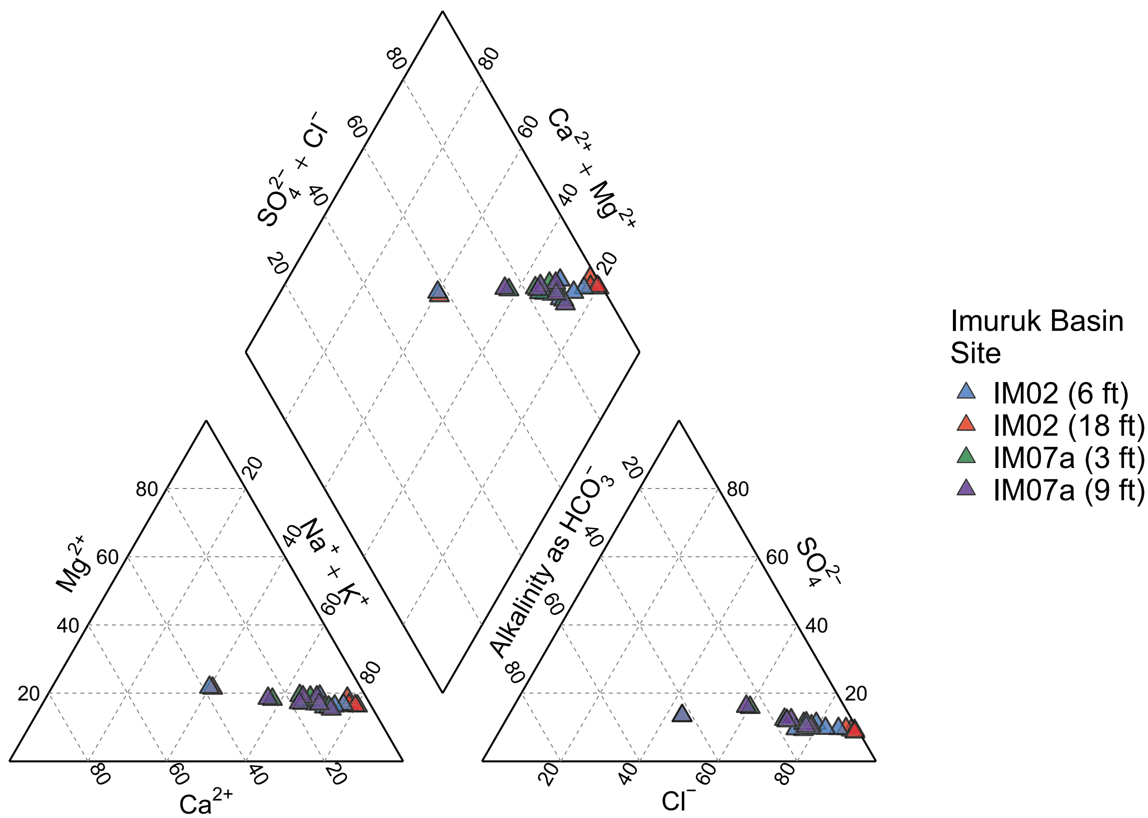

Figure 25. Piper diagram for Imuruk Basin waters of the Graphite Creek Project water quality survey area near Teller, Alaska 2023–2024. Piper diagram does not include legacy data 2014–2022.

toward the center of the diagram (mixed water type). The shallow samples from IM02 are slightly to the left, and the samples from IM07a (both depths) are further to the left (more mixed). Interestingly, a pair of samples from IM02 (deep and shallow) are the furthest to the left (center of the diagram and mixed field) and are likely from a period of out-going flow when the basin was dominantly freshwater.

Temperature and dissolved oxygen

The temperature of the Imuruk Basin water typically ranges from 10 to 13 ^{o}C in the summer with the warmest water temperatures in August (Appendix D). DO levels range from 10.9 to 12.4 mg/L. DO is poorly correlated with temperature and is moderately inversely correlated with salinity.

Turbidity and total suspended solids

The Imuruk Basin is a clear water body with turbidity typically ranging from 2.8 to 4.4 NTU (Figure 26). Suspended solids are also low, typically ranging from below method detection limits to 4.6 mg/L (Figure 27).

pH and alkalinity

Imuruk Basin water is typically slightly basic with a pH in the 7.5 to 8 range (Figure 28, Appendix D). Typical seawater has a pH of a little over 8, so this range is reasonable for slightly brackish water. The alkalinity is in the range of 50 to 80 mg/L which is low for seawater, but higher than seen in the Cobblestone River or deposit area streams (Figure 29). The alkalinity suggests that the Imuruk Basin waters have good buffering capacity.

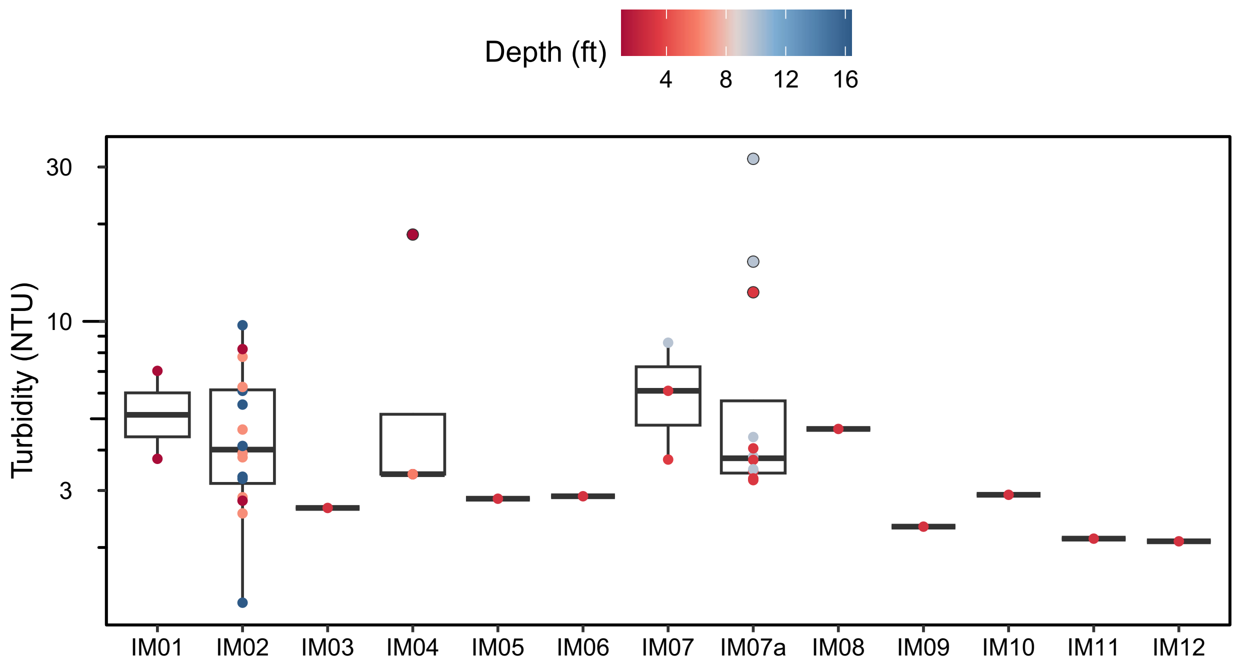

Figure 26. Ambient *in situ* turbidity (NTU) measured at sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024. Depth (ft) is the depth at which turbidity was measured.

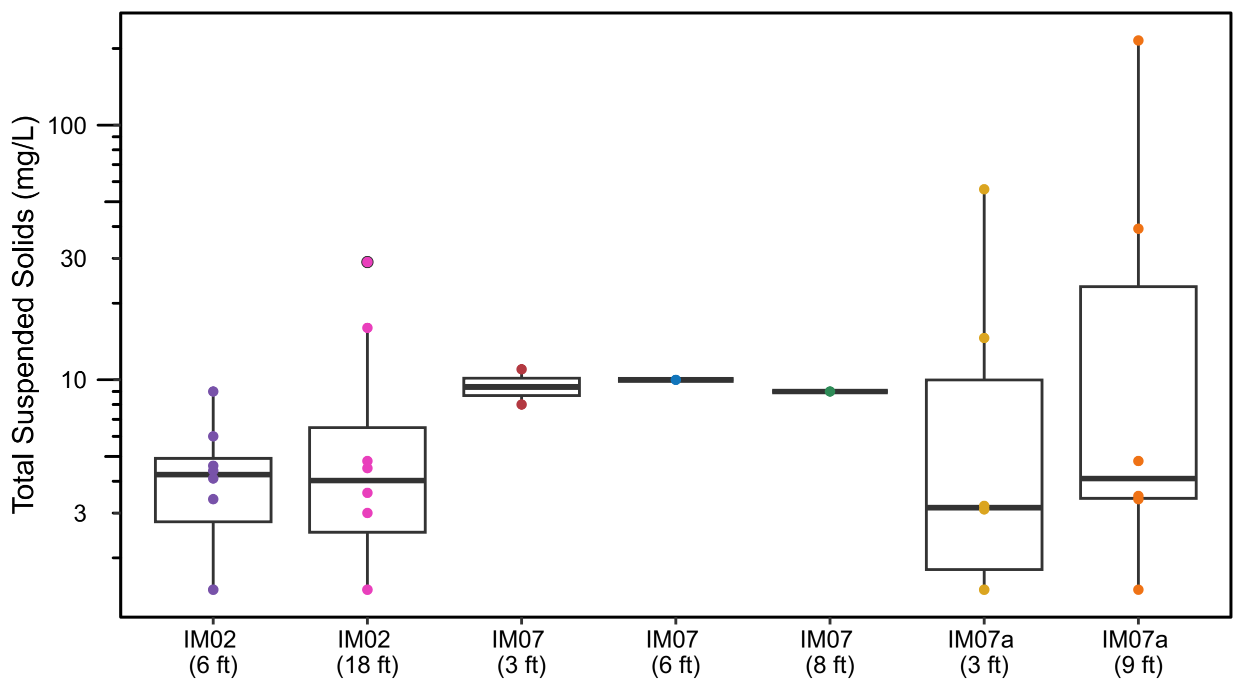

Figure 27. Total suspended solids (TSS) concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

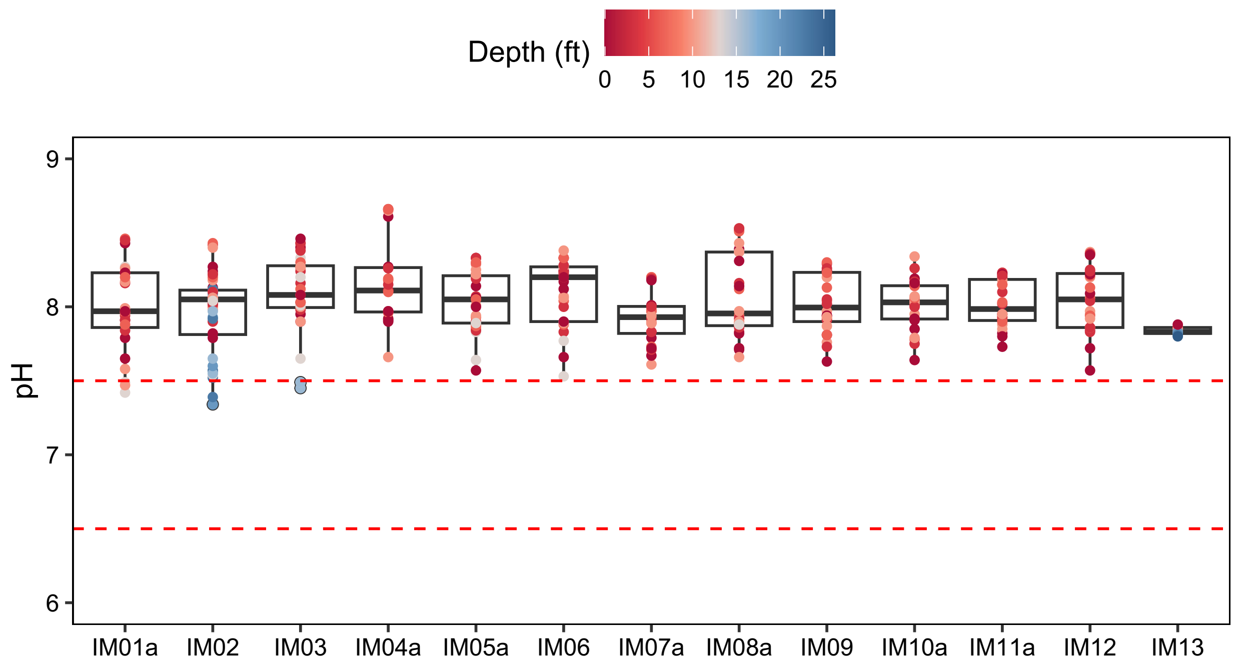

Figure 28. Ambient *in situ* pH measured at sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2023–2024. Data collected in 2022 excluded due to quality concerns. Depth (ft) is the depth at which pH was measured.

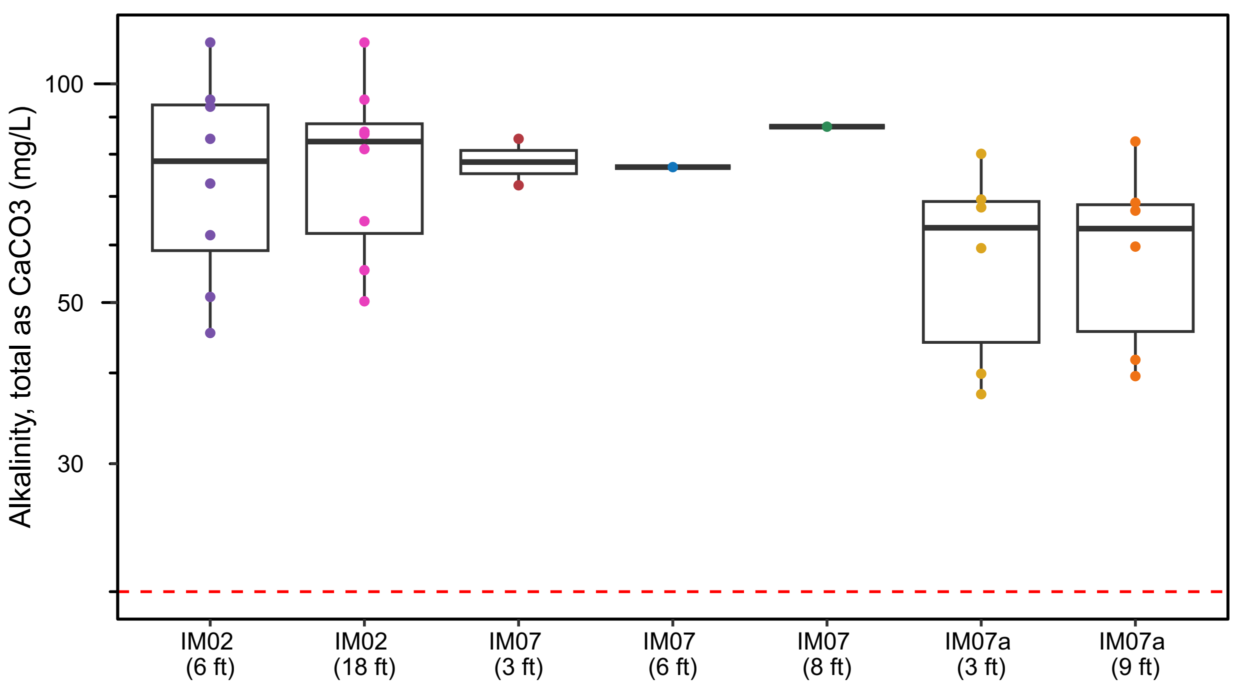

Figure 29. Total alkalinity concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

Total dissolved solids and sulfate

Salinity, TDS, and sulfate are directly correlated. TDS and sulfate were measured at two depths at two sample locations. TDS levels in the Imuruk Basin range from 450 to 1140 mg/L, generally above the freshwater standard of 500 mg/L (Figure 30). The sulfate content ranges from 35 to 90 mg/L, well below the freshwater standard (Figure 31). The high TDS is likely due to the brackish conditions as suggested by the correlation with salinity and that the major anion ratios are similar to those of seawater.

Metals

Alaska does not have brackish water criteria. The freshwater criteria are used for comparison purposes (ADEC, 2025).

Available samples suggest that the aluminum content of Imuruk Basin is typically in the range of 0.10 to 0.16 mg/L which is above typical levels for marine and freshwaters (Figure 32). The freshwater standard is 0.087 mg/L. Aluminum concentrations at both depths at the location relatively near the inlet of the deposit area streams is greater than 0.4 mg/L in late-July/early-August of both 2023 and 2024.

The iron content is typically in the range of 0.3 to 0.6 mg/L (Figure 33). The freshwater standard is 1 mg/L for iron. In both 2023 and 2024, the highest concentrations were seen in late-July/early-August at both depths at the sample location nearest the deposit area stream inlets, exceeding the freshwater criteria (Table 5). Other metals in Imuruk Basin waters do not exceed freshwater standards (Figure 34).

Nutrients and volatile organic compounds

Water in the Imuruk Basin has not been analyzed for VOCs.

Nitrate and nitrite concentrations were below 0.01 mg/L in most samples, and total phosphorus was typically below 0.02 mg/L (Appendix D). These values are consistent with undeveloped freshwater systems and indicate that Imuruk Basin is not subject to nutrient loading from upstream sources.

4 DISCUSSION

Graphite Creek and other creeks in the area have red iron oxide/hydroxide precipitate in the reach immediately downstream of the mountain front and white aluminum sulfate precipitate in the upper reaches (España, 2007; Zarroca et al., 2021). This suggests that there is naturally occurring acid rock drainage (ARD) in the area. This is supported by the median pH of 5 to 5.5 in most of the deposit area creeks. The acidity of the groundwater is more variable, but quite high at some locations (median <3 at 24 GCT029).

Iron oxide/hydroxide and sulfate are often seen in ARD environments due to the oxidation of pyrite (FeS_2) and pyrrhotite ($Fe_{1-x}S$) (España, 2007). Iron is elevated in some streams and very high in the groundwater at some upland locations (>1000 mg/L at 21GC068 and 22GC075). Sulfate is at or above regulatory limits in most deposit area streams and is above regulatory limits with few exceptions in the upland groundwater.

Many metals are mobile in acidic environments (Downing et al., 2014). Aluminum is a common rock forming mineral which is soluble at low pH's (high acidity) (España, 2007). Aluminum is consistently above regulatory limits in all project area streams except the Cobblestone River. However, the upland aquifer is less consistent with slightly over half of the sample locations having high aluminum levels. Though far less common in the rocks, other metals are mobile under ARD conditions, and we see elevated levels of nickel, cobalt, copper, and others in the groundwater and streams.

Another common feature of ARD systems is high levels of total dissolved solids (TDS). The upland aquifer has elevated TDS at most well sites with almost 10,000 mg/L in 21GC068 and 22GC075. The TDS in project area streams is also elevated.

Alkalinity in the rocks and water buffers the acidity seen in ARD environments (Sartz et al, 2012). The alkalinity in the deposit area streams is quite low suggesting little buffering capacity. On the other hand, alkalinity levels are mixed in the upland aquifer. It is not known if the high alkalinity seen in some wells is related to cement contamination in the screened interval.

Barium exceeds regulatory limits in two groundwater samples. It is not known if this is naturally occurring or a consequence of artesian water control. Barite was used in some wells to

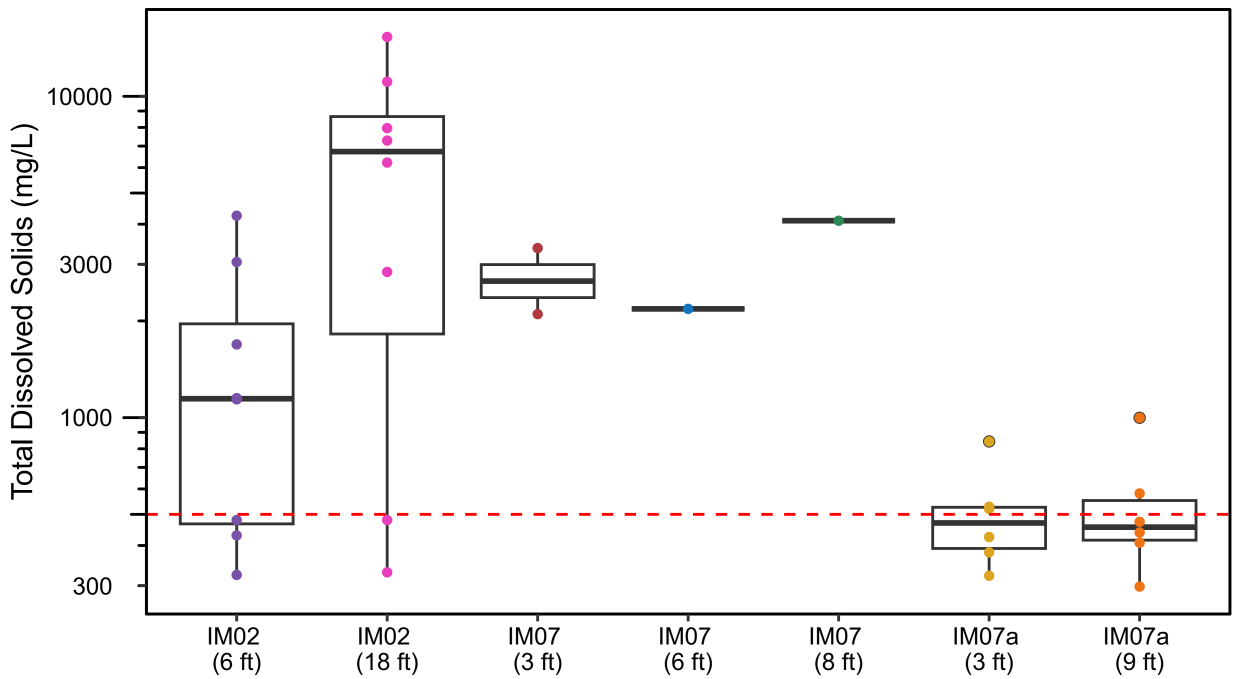

Figure 30. Total dissolved solids (TDS) concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

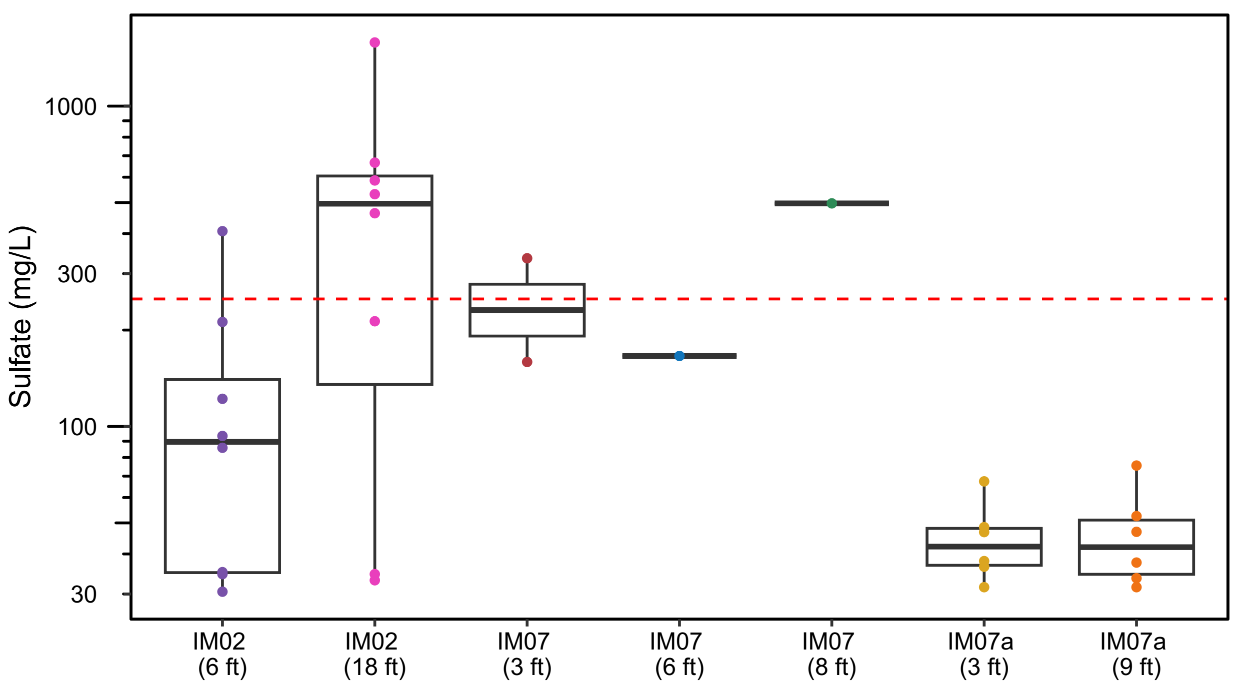

Figure 31. Sulfate concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

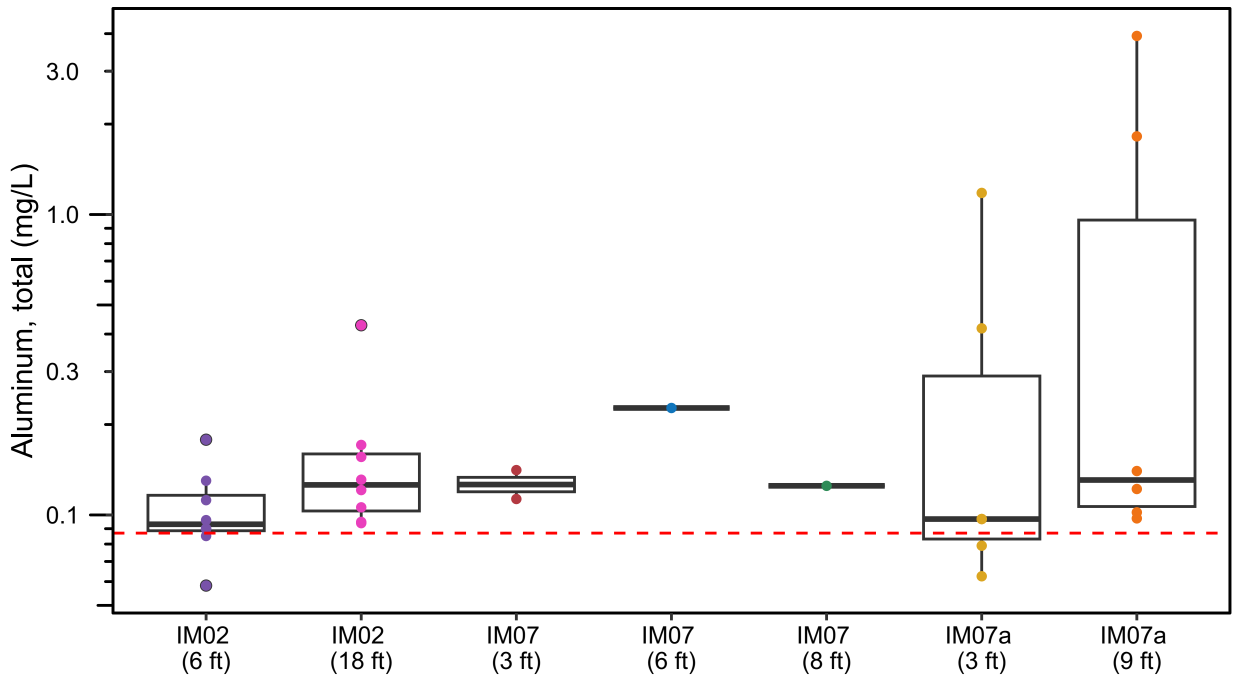

Figure 32. Total aluminum concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

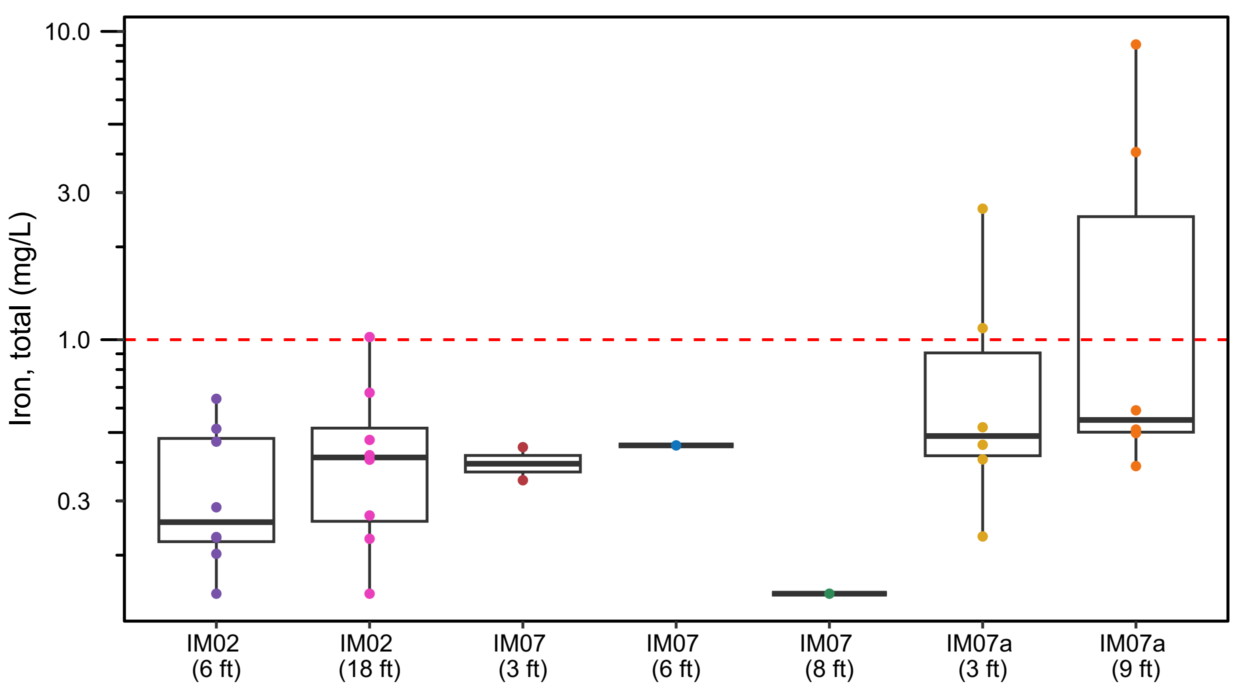

Figure 33. Total iron concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

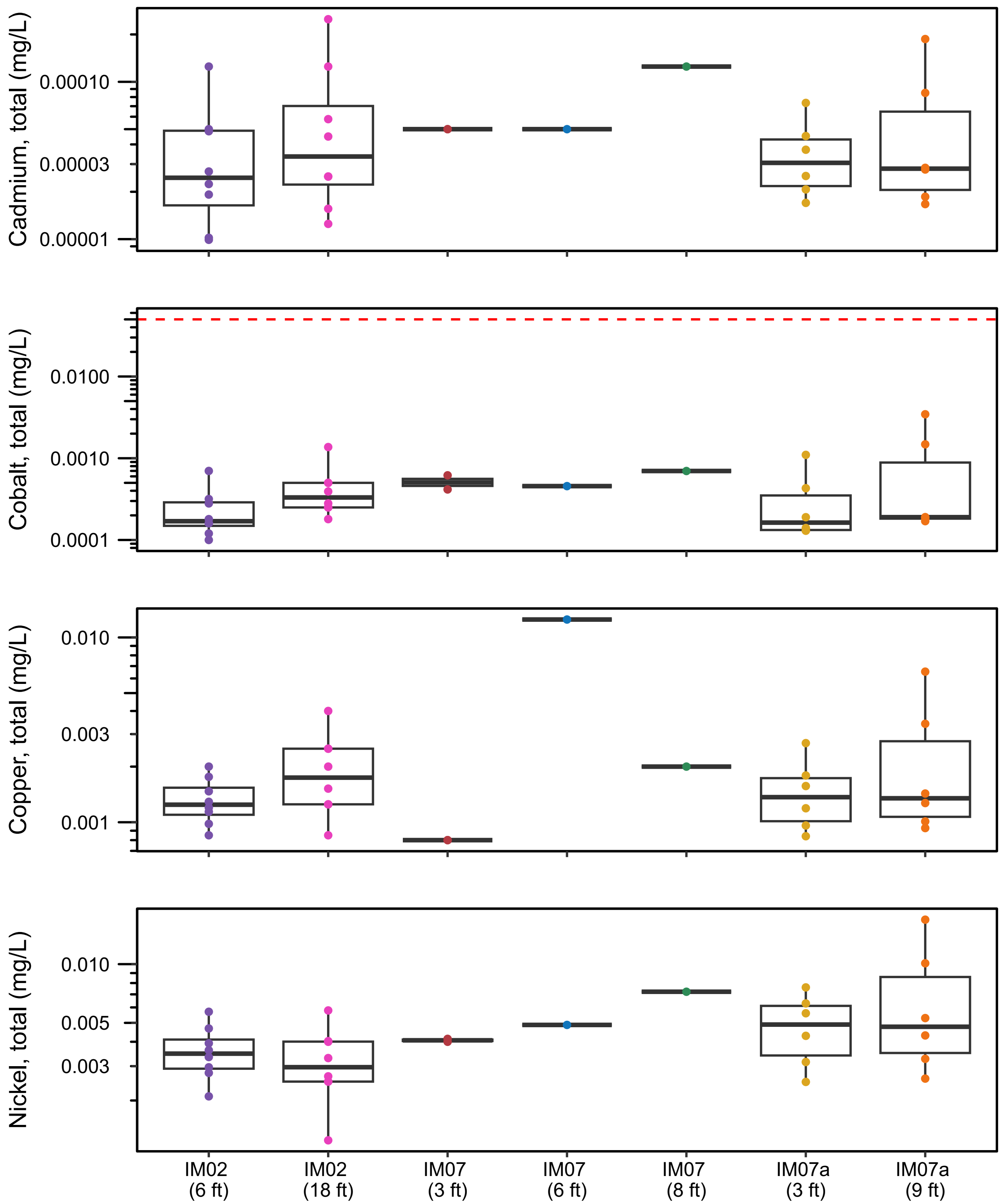

Figure 34. Total cadmium, cobalt, copper, and nickel concentrations at select sample sites on the Imuruk Basin of the Graphite Creek Project water quality survey area near Teller, Alaska, 2022–2024.

control water flow and is generally considered to be inert.

The Kigluaik Fault divides the upland aquifer from the lowland aquifer. The fault has a high clay gouge content and is thought to have low permeability, restricting groundwater flow between the upland aquifer and the lowland aquifer (Tundra, 2024). Another difference between the aquifers is that the upland aquifer is fracture-controlled with low storativity, while the lowland aquifer is a sedimentary type aquifer with high storativity. As a result, there is much more water per unit volume in the lowland aquifer than the upland aquifer. This would suggest that the concentration of constituents in the upland groundwater will likely drop when the water flows into the lowland aquifer. This suggestion is supported by the groundwater quality. Most wells tested in the lowland aquifer to date have high quality water which meets ADEC thresholds for most analytes. These wells are downgradient from the upland aquifer. The exception is the most proximal well, 22GT008D which is screened approximately 20 m above the fault. It has elevated sulfate, TDS, aluminum, and iron. These elevated concentrations may be due to uplands water that is leaking through the fault and then dissipating before it reaches more distal wells. The other exception is the most distal well (24GT026) which has elevated aluminum and iron.

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Appendix A1. Laboratory water chemistry summary (minimum, 25th percentile, median, 75th percentile, maximum) for ground and surface waters of the Graphite Creek Project survey area near Teller, Alaska, 2014–2025.

	ADEC	Groundwater												Surface Water					
	Alaska Water	Upland						Lowland						Cobblestone River					
Analyte (mg/L)	Quality Standards (mg/L)	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum
Aluminum	0.087	0	0.0036	0.02895	0.4485	3.9975	43.7	1	0.0015	0.0105	0.0297	0.264	4.23	9	0.009	0.021	0.05	0.069	0.154
Antimony	0.006	34	0.00005	0.0002	0.00025	0.0005	0.00325	21	0.00005	0.00005	0.0002	0.00023	0.00426	42	0.0000075	0.00005	0.000125	0.00034875	0.001
Arsenic	0.01	21	0.00005	0.0002075	0.000265	0.0006225	0.00454	12	0.00005	0.0001	0.00012	0.00028	0.0015	26	0.00005	0.0001	0.00013	0.0002275	0.0025
Barium	2	0	0.00268	0.0146	0.0417	0.15775	5.02	0	0.0105	0.013	0.0186	0.0356	0.304	0	0.00479	0.00867	0.0103	0.0125	0.041
Beryllium	0.004	20	0.00001	0.00002	0.0001635	0.0010255	0.00556	26	0.00001	0.00001	0.00001	0.00004	0.000141	45	0.00001	0.00001	0.00004	0.00005	0.0005
Bismuth	NEL	45	0.000025	0.000025	0.000125	0.00025	0.424	31	0.000025	0.000025	0.000025	0.000161	0.02	31	0.000025	0.000025	0.000025	0.02	0.025
Boron	0.75	25	0.005	0.01075	0.05	0.147	0.441	30	0.005	0.005	0.005	0.011	0.105	39	0.00168	0.005	0.005	0.015	0.0625
Bromide	NEL	38	0.025	0.125	0.25	0.5	1.25	25	0.025	0.025	0.025	0.025	0.125	16	0.025	0.025	0.025	0.025	0.025
Cadmium	calculated[a]	25	0.0000025	5.825E-06	0.000025	0.000305	0.00575	1	0.0000025	0.0000334	0.0000652	0.0000833	0.000274	28	0.0000075	0.00001425	0.000025	0.000044	0.0005
Calcium	NEL	0	12.3	109.5	351.5	415.75	587	0	27.7	64.7	81.1	102	364	0	7.95	15.8	18	22.8	37.8
Cesium	NEL	0	0.000036	0.000135	0.000228	0.0003175	0.000972	16	0.000005	0.000005	0.000005	0.000082	0.00115	0	0.000018	0.00002175	0.0000265	0.00003025	0.000038
Chromium	0.1	31	0.00025	0.0005	0.00125	0.0025	0.0109	5	0.00025	0.00073	0.0017	0.00382	0.059	36	0.000202	0.00025	0.00025	0.00046525	0.002
Cobalt	0.05	9	0.00005	0.0031825	0.0708	0.449	1.44	11	0.00005	0.00005	0.00028	0.00098	0.00254	25	0.00005	0.00005	0.00009	0.000188	0.0005
Copper	calculated[a]	31	0.00025	0.0005075	0.00125	0.004	0.181	8	0.00025	0.00131	0.00315	0.00545	0.0734	37	0.00025	0.00025	0.0004	0.000478	0.001
Iron	1	0	0.026	0.30675	45.05	1152.5	2780	9	0.005	0.013	0.052	0.391	5.88	10	0.015	0.05	0.085	0.148	0.84
Lead	calculated[a]	31	0.000025	0.00005	0.000168	0.0004335	0.00271	17	0.000025	0.000025	0.00005	0.000389	0.00327	35	0.000025	0.000025	0.00005	0.0001075	0.0005
Lithium	2.5	1	0.0005	0.012675	0.0396	0.091625	0.31	17	0.0005	0.0005	0.0005	0.0012	0.023	26	0.0005	0.0005	0.0009625	0.00408	0.05
Magnesium	NEL	0	1.05	27.475	98.3	438.25	1010	0	1.64	10.1	12.8	20.1	75.1	0	1.71	3.2	3.88	4.93	7.71
Manganese	NEL[b]	0	0.00068	0.103625	1.235	16.05	27.5	0	0.00032	0.00302	0.00759	0.0444	0.427	2	0.001	0.00267	0.0052	0.0126	0.048
Molybdenum	0.01	19	0.00005	0.00024	0.0004085	0.001	0.0271	0	0.000093	0.000215	0.000982	0.00292	0.0148	9	0.000353	0.0005575	0.0007475	0.000907	0.0023
Nickel	calculated[a]	7	0.00025	0.01026	0.235	3.9625	13.3	8	0.00025	0.00108	0.00205	0.00558	0.0258	9	0.00054	0.000816	0.001	0.00112	0.00616
Phosphorous	NEL	36	0.005	0.025	0.073	0.125	0.389	17	0.005	0.025	0.025	0.05625	1.28	40	0.00155	0.005	0.025	0.025	0.67
Potassium	NEL	0	0.526	1.8775	3.43	5.8875	20.2	0	1.4	1.79	2.08	3.42	24.4	2	0.522	0.79075	0.9565	1.095	1.27
Rubidium	NEL	0	0.00142	0.00512	0.00669	0.00837	0.0442	2	0.0001	0.00054	0.00069	0.00176	0.0771	0	0.00126	0.0018775	0.002135	0.0023275	0.00242
Selenium	0.005	22	0.000025	0.000125	0.00025	0.00102	0.015	0	0.00026	0.000736	0.000873	0.00128	0.00235	18	0.000064	0.0001275	0.000155	0.00039	0.0025
Silicon	NEL	0	1.64	3.5475	6.62	8.235	15.6	0	4.76	5.49	6.09	6.75	16.3	0	1.46	2.23	2.4	2.785	3.14
Silver	calculated[a]	37	0.000005	0.00002275	0.000043	0.0000985	0.000543	23	0.000005	0.000005	0.000018	0.00005	0.000386	45	0.0000031	0.000005	0.0000225	0.00005	0.0005
Sodium	NEL	0	1.57	14.4	38.05	57.275	183	0	4.24	4.91	6.09	8.44	86.1	0	1.11	1.7025	2.02	2.32	3.13
Strontium	NEL	0	0.0293	0.26275	1.61	2.6575	4.73	0	0.0845	0.199	0.254	0.338	1.66	0	0.0153	0.03135	0.04015	0.0579	0.0738
Sulfur	NEL	0	14.2	136.5	297.5	1312.5	2130	0	7.27	44.1	63.3	81.3	328	0	3.83	7.6175	10.22	12.75	18.1
Tellurium	NEL	36	0.0001	0.0001	0.00021	0.0005	0.001	24	0.0001	0.0001	0.0001	0.0001	0.00031	16	0.0001	0.0001	0.0001	0.0001	0.0001
Thallium	0.0017	41	0.000005	0.00001	0.000025	0.00005	0.0005	25	0.000005	0.000005	0.000005	0.00005	0.000082	42	0.0000031	0.000005	0.00002026	0.00005	0.0005
Thorium	NEL	34	0.00005	0.00005	0.00024	0.00025	0.00107	19	0.00005	0.00005	0.00005	0.00011	0.0019	15	0.00005	0.00005	0.00005	0.00005	0.00016
Tin	NEL	39	0.00005	0.0001375	0.00025	0.0011675	0.2	23	0.00005	0.00005	0.00011	0.00842	0.02	32	0.00005	0.00005	0.00017	0.02	0.125
Titanium	NEL	26	0.00015	0.00075	0.0015	0.01655	0.423	8	0.00015	0.0004	0.0069	0.0253	0.367	6	0.00053	0.0013225	0.0025	0.0055825	0.0093
Tungsten	NEL	16	0.0001	0.00025	0.0005	0.006205	0.0555	13	0.00005	0.00005	0.00005	0.00042	0.0848	16	0.00005	0.00005	0.00005	0.00005	0.00005
Uranium	0.03	2	0.000082	0.00027475	0.00095	0.003595	0.044	0	0.000115	0.00026	0.000338	0.000744	0.00238	0	0.000158	0.00034475	0.000495	0.0006115	0.000755
Vanadium	0.1	34	0.00025	0.00059	0.00125	0.0025	0.017	19	0.00025	0.00025	0.00025	0.00109	0.0135	34	0.000155	0.00025	0.00025	0.00071	0.0025
Zinc	calculated[a]	9	0.0015	0.0056	0.08245	2.3975	12.8	16	0.0015	0.0015	0.0037	0.016	0.111	35	0.00147	0.0015	0.003	0.00394	0.005

Appendix A1. Continued.

	ADEC	Groundwater												Surface Water					
	Alaska Water	Upland						Lowland						Cobblestone River					
Analyte (mg/L)	Quality Standards (mg/L)	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum
Zirconium	NEL	35	0.0001	0.0001	0.000355	0.0005	0.00109	23	0.0001	0.0001	0.0001	0.0001	0.00243	16	0.0001	0.0001	0.0001	0.0001	0.0001
Cyanide	0.2	48	0.0015	0.0025	0.0025	0.0025	0.1	33	0.0015	0.0025	0.0025	0.0025	0.0025	32	0.0015	0.0015	0.0025	0.0025	0.0353
Weak Acid Dissociable CN	0.0052	48	0.0015	0.0025	0.0025	0.0025	0.01	33	0.0015	0.0025	0.0025	0.0025	0.0025	35	0.00075	0.0015	0.0025	0.0042	0.0076
Mercury	0.00005	17	1.5E-07	0.00000025	8.6E-07	2.115E-06	3.56E-05	20	1.5E-07	2.5E-07	2.5E-07	1.77E-06	2.97E-05	23	0.00000015	0.00000025	0.00000025	0.000000657	0.00000373
Sulfate	250	0	42	495	1115	4610	14200	0	21.9	131	193	249	950	0	7.5	21.75	33.2	43.575	86
Chloride	250	36	1.08	1.78	4.865	12.5	98.6	6	1	1.8	2.07	2.61	75.5	7	0.9	1.195	1.345	1.545	3.51
Flouride	1	16	0.077	0.2	0.9535	2.0625	15.4	14	0.01	0.025	0.05	0.134	0.696	14	0.025	0.074	0.091	0.111	0.25
Ammonia	NI	4	0.0025	0.01145	0.0156	0.021475	4.65	15	0.0025	0.0025	0.0025	0.0235	0.54	12	0.0025	0.0025	0.0025	0.00315	0.0114
Kjeldahl Nitrogren [TKN]	NEL	30	0.025	0.025	0.04	0.20275	7.11	7	0.025	0.1	0.138	0.34	3.72	19	0.025	0.025	0.1	0.1	0.133
Nitrate-N	10	27	0.0125	0.0241	0.05	0.12125	0.215	0	0.0957	0.491	1.13	1.44	2.07	0	0.049	0.0618	0.08005	0.123	0.15
Nitrite-N	1	37	0.0005	0.0025	0.005	0.01	0.789	19	0.0005	0.0005	0.0005	0.0025	0.0546	16	0.0005	0.0005	0.0005	0.0005	0.0005
Nitrate + Nitrite as Total N	10	5	0.01	0.0275	0.0935	0.1915	0.479	1	0.01	0.155	0.781	1.28	1.34	8	0.0155	0.041	0.05	0.097	0.188
Hardness as CaCO3	NEL	0	63	427.75	1170	2732.5	5270	0	82.2	208	234	322	1080	0	26.8	51.2	60	72.6	129
Alkalinity	20 (minimum)	10	0.5	2.875	42.15	78.65	896	0	23.7	42	59.6	98.9	194	0	16.1	27.1	36	38	43.6
Total Suspended Solids	NEL	8	1.5	6.85	46.9	98	590	16	1.5	1.5	3.1	18.3	203	35	0.55	1.25	1.5	2.5	13.3
Total Dissolved Solids	500	0	99	811.5	1770	7862.5	15800	0	139	318	396	508	1570	0	46	68.8	88	113	171

Note: In instances where a "Non-detect" is reported the minimum value reported represents half the laboratory detection limit.

Appendix A2. Laboratory water chemistry results summary (minimum, 25th percentile, median, 75th percentile, maximum) for surface water, and Imuruk Basin sample sites of the Graphite Creek Project survey area near Teller, Alaska, 2014–2025.

	ADEC	Surface Water												Imuruk Basin					
	Alaska Water	Unnamed Streams						Deposit Area Streams											
Analyte (mg/L)	Quality Standards (mg/L)	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum
Aluminum	0.087	0	0.0723	0.14	0.228	0.877	8.54	6	0.0116	0.96	2.3	4.975	106	0	0.0582	0.095775	0.117	0.15975	3.93
Antimony	0.006	26	0.0000075	0.00005	0.00005	0.0000875	0.001	137	0.0000075	0.00005	0.00015	0.00085	0.0375	20	0.00005	0.000115	0.00013	0.0004	0.002
Arsenic	0.01	5	0.00005	0.0002	0.000272	0.00045	0.002	119	0.00005	0.00005	0.0001	0.00068	0.01	4	0.0005	0.000635	0.000875	0.0011225	0.00538
Barium	2	0	0.0108	0.0131	0.0174	0.0226	0.0686	0	0.00387	0.008305	0.0108	0.01435	0.096	0	0.00767	0.00986	0.0154	0.021725	0.034
Beryllium	0.004	18	0.00001	0.00001	0.00004	0.000059	0.000292	31	0.0000125	0.0002585	0.0005	0.0008055	0.00964	26	0.00001	0.00001	0.000027	0.0000805	0.0004
Bismuth	NEL	24	0.000025	0.000025	0.000025	0.00375	0.02	105	0.000025	0.000025	0.000025	0.02	0.125	31	0.000025	0.000025	0.000025	0.0101875	0.2
Boron	0.75	28	0.00075	0.005	0.005	0.005	0.0625	126	0.0017	0.005	0.01	0.015	0.0625	0	0.029	0.066	0.1235	0.4155	1.97
Bromide	NEL	18	0.025	0.025	0.025	0.025	0.025	58	0.025	0.025	0.025	0.025	0.125	0	0.257	0.58775	0.662	1.5825	16.6
Cadmium	calculated[a]	10	0.0000075	0.0000146	0.000026	0.000113	0.000166	20	0.0000181	0.0005	0.00123	0.00314	0.0841	11	0.0000099	2.0325E-05	0.0000327	5.1975E-05	0.00025
Calcium	NEL	0	3.84	6.36	8.58	49.2	85.5	0	12.4	39.6	64.5	104	542	0	14.9	23.9	41	61.35	194
Cesium	NEL	0	0.000012	0.00004225	0.0000905	0.0002055	0.00115	0	0.000043	0.000135	0.0002045	0.00029025	0.000873	0	0.000032	0.000042	0.00005	0.000105	0.00123
Chromium	0.1	13	0.00025	0.00025	0.000504	0.0019625	0.0113	121	0.0000755	0.00025	0.00025	0.0015	0.00785	26	0.00025	0.00025	0.0005	0.00125	0.00636
Cobalt	0.05	1	0.00035	0.00047	0.00079	0.000986	0.00488	4	0.0000528	0.0122	0.0341	0.0905	3.53	5	0.0001	0.0001775	0.000265	0.0005	0.00345
Copper	calculated[a]	5	0.0004	0.00066	0.00095	0.00175	0.0117	9	0.000315	0.00411	0.00927	0.0264	0.277	10	0.0008	0.0010025	0.00136	0.002	0.0125
Iron	1	0	0.468	1.11	1.46	2.47	8.38	28	0.0031	0.05	0.161	1.61	99	3	0.15	0.25925	0.451	0.5375	9.07
Lead	calculated[a]	11	0.000025	0.00005	0.00009	0.0004533	0.00249	114	0.0000155	0.000025	0.00005	0.0005	0.00215	11	0.00005	0.00010675	0.0001465	0.00025	0.00268
Lithium	2.5	14	0.00031	0.0005	0.0005	0.00175	0.05	24	0.00031	0.0051	0.01	0.01565	0.104	0	0.0039	0.0049	0.00715	0.0101	0.0543
Magnesium	NEL	0	2.1	2.62	3.29	12.8	19	0	0.85	9.18	19.9	45.25	496	0	12.7	14.65	35.35	112.75	543
Manganese	NEL[b]	0	0.0332	0.0449	0.0568	0.0827	0.14	4	0.000322	0.11	0.304	0.7715	30.8	0	0.00795	0.010975	0.0166	0.033275	0.0952
Molybdenum	0.01	8	0.0000713	0.000124	0.000207	0.000615	0.00145	62	0.000025	0.0001835	0.000335	0.000981	0.025	0	0.000342	0.00049525	0.0007705	0.0016325	0.00528
Nickel	calculated[a]	1	0.00057	0.00092	0.00179	0.00427	0.0177	3	0.001	0.08955	0.25	0.5825	12.5	3	0.00125	0.0029125	0.004	0.0053675	0.0169
Phosphorous	NEL	20	0.005	0.0147	0.025	0.025	0.62	127	0.00155	0.005	0.025	0.025	1	15	0.018	0.025	0.0355	0.09475	0.296
Potassium	NEL	2	0.428	0.683	0.842	1.58	2.18	5	0.402	0.88525	1.29	1.9625	8.36	0	2.42	5.665	10.455	35.2	162
Rubidium	NEL	0	0.00202	0.0041375	0.004465	0.00617	0.0154	0	0.00163	0.0033975	0.005805	0.0086475	0.0207	0	0.00157	0.002505	0.00351	0.00634	0.033
Selenium	0.005	9	0.000025	0.000086	0.000155	0.0002795	0.001	45	0.000141	0.00036	0.0006	0.0014	0.025	13	0.00005	0.000103	0.000127	0.00017625	0.0005
Silicon	NEL	0	3.04	4.98	5.3	5.725	13.5	0	2.55	4.025	5.035	7.005	12.6	0	1.27	1.65	2.695	3.5625	8.48
Silver	calculated[a]	25	0.0000031	0.000005	0.000005	0.000048	0.00045	143	0.0000031	0.000005	0.0000225	0.000275	0.005	30	0.000005	0.000005	0.000005	0.0000625	0.0005
Sodium	NEL	0	2.2	2.63	2.88	3.9	5.56	0	1.06	2.9375	4.275	7.1125	34.6	0	48.1	107.5	234.5	886.25	4320
Strontium	NEL	0	0.021	0.0276	0.0323	0.1795	0.317	0	0.0374	0.089	0.138	0.198	0.455	0	0.118	0.14125	0.254	0.74575	3.26
Sulfur	NEL	0	0.99	2.25	51.2	66.575	89.5	0	14.5	48.625	75.3	119.5	314	0	11.4	12.4	18.2	32.3	294
Tellurium	NEL	18	0.0001	0.0001	0.0001	0.0001	0.0001	58	0.0001	0.0001	0.0001	0.0001	0.0002	24	0.0001	0.0001	0.0001	0.0001	0.001
Thallium	0.0017	12	0.000005	9.705E-06	0.000024	0.00005	0.00045	71	0.0000031	2.0325E-05	0.00005	0.0004075	0.005	28	0.000005	0.000005	0.0000105	0.0000625	0.0005
Thorium	NEL	9	0.00005	0.00005	0.00012	0.0002425	0.00104	55	0.00005	0.00005	0.00005	0.00005	0.00113	20	0.00005	0.00005	0.00005	0.0002425	0.00074
Tin	NEL	24	0.00005	0.00005	0.00005	0.0005225	0.125	110	0.00005	0.00005	0.00005	0.02	0.125	31	0.00005	0.00005	0.00005	0.010375	0.2
Titanium	NEL	4	0.00192	0.00447	0.0112	0.05925	0.439	32	0.00015	0.00032	0.0025	0.0137	0.362	7	0.0009	0.003385	0.00462	0.0125	0.134
Tungsten	NEL	18	0.00005	0.00005	0.00005	0.00005	0.00005	58	0.00005	0.00005	0.00005	0.00005	0.0001	22	0.00005	0.00005	0.00005	0.0001025	0.0005
Uranium	0.03	5	0.00005	0.0000515	0.000137	0.000233	0.000558	0	0.000046	0.000417	0.00116	0.0025	0.0131	0	0.000175	0.00049075	0.0006165	0.00086675	0.00197
Vanadium	0.1	4	0.00025	0.00064	0.00133	0.00345	0.0202	130	0.000155	0.00025	0.00025	0.00125	0.015	12	0.0005	0.0007275	0.00105	0.00125	0.0108

Appendix A2. Continued.

	ADEC	Surface Water												Imuruk Basin					
	Alaska Water	Unnamed Streams						Deposit Area Streams											
Analyte (mg/L)	Quality Standards (mg/L)	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum	Non-detect (#)	Minimum	25th percentile	Median	75th percentile	Maximum
Zirconium	NEL	11	0.0001	0.0001	0.0001	0.0002975	0.00048	58	0.0001	0.0001	0.0001	0.0001	0.0002	14	0.0001	0.0001	0.000255	0.000365	0.001
Zinc	calculated[a]	14	0.0015	0.0015	0.003	0.00375	0.0243	5	0.00251	0.05225	0.14	0.3655	7.13	23	0.0015	0.0015	0.00575	0.0147	0.039
Cyanide	0.2	25	0.0015	0.0025	0.0025	0.0025	0.0076	114	0.0015	0.0015	0.0025	0.0025	0.05	32	0.0015	0.00225	0.0025	0.0025	0.005
Weak Acid Dissociable CN	0.0052	25	0.00075	0.00175	0.0025	0.0025	0.013	125	0.00075	0.0015	0.0025	0.0025	0.0375	32	0.0015	0.00225	0.0025	0.0025	0.005
Mercury	0.00005	1	2.5E-07	0.00000146	1.78E-06	2.81E-06	0.00001	95	1.5E-07	0.00000025	2.5E-07	6.68E-07	5.66E-06	1	1.5E-07	2.5025E-06	5.49E-06	8.8625E-06	3.52E-05
Sulfate	250	0	1.57	4.03	7.93	157.5	257	0	24.2	149.75	258.5	465.75	6900	0	30.5	36.15	71.45	243.5	1580
Chloride	250	0	1.4	1.655	1.95	2.33	4	62	0.4	1	1.25	1.5	4.57	0	84	196.75	381	1765	9460
Flouride	1	5	0.025	0.0435	0.05	0.056	0.085	29	0.042	0.18775	0.25	0.451	5.7	27	0.05	0.05	0.094	0.5	5
Ammonia	NI	0	0.0114	0.0441	0.069	0.10875	0.132	46	0.0025	0.0025	0.0025	0.0025	0.0175	14	0.0025	0.0025	0.0025	0.0075	0.0743
Kjeldahl Nitrogren [TKN]	NEL	0	0.183	0.2575	0.4	0.463	0.78	86	0.025	0.025	0.025	0.1	0.676	1	0.1	0.2295	0.279	0.32075	1.21
Nitrate-N	10	0	0.0871	0.33425	0.5065	0.64675	0.782	0	0.019	0.034875	0.04375	0.06565	0.201	20	0.0025	0.0125	0.0125	0.05	0.25
Nitrite-N	1	5	0.0005	0.00065	0.00155	0.0019	0.0039	58	0.0005	0.0005	0.0005	0.0005	0.0025	24	0.0005	0.0025	0.0025	0.005	0.05
Nitrate + Nitrite as Total N	10	0	0.0505	0.1395	0.202	0.22	0.544	28	0.01	0.03675	0.05	0.062	0.197	8	0.01	0.01	0.01	0.01	0.01
Hardness as CaCO3	NEL	0	14.9	26.8	33.2	159	301	0	35	140	239.5	446.75	3430	0	93.8	113.75	221.5	606.5	2400
Alkalinity	20 (minimum)	0	15.4	23.45	26.8	32.4	39.5	69	0.5	0.5	1	4.05	29	0	37.4	58.4	70.9	84.325	114
Total Suspended Solids	NEL	8	1.5	2.5	6	22.1	164	43	0.55	1.8125	4.5	10.3	125	7	1.5	3.075	4.45	9.25	215
Total Dissolved Solids	500	0	44	63	71.3	262	471	0	58	233.25	394	720.25	5950	0	298	436.75	921	3130	15300

Note: In instances where a "Non-detect" is reported the minimum value reported represents half the laboratory detection limit.

Appendix B. Ambient *in-situ* water quality conditions associate with groundwater laboratory samples from monitoring wells of the Graphite Creek Project survey area near Teller, Alaska, 2014–2025.

Site ID	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
12GC002[a]	Cal Craig	8/25/2016	16:40	4.24	6.80	–	4.98	1,073	–	3.5	–
21GC066	Katana	10/14/2021	14:22	1.73	4.78	105.1	–	1,036	1,864	–	-28.5
21GC066	Katana	7/17/2022	8:09	11.76	6.58	–	2.55	1,621	2,168	3.77	62.3
21GC066	Katana	8/31/2022	19:20	3.22	6.00	–	1.04	567	971	0.94	-10.5
21GC066	Katana	9/11/2022	13:10	3.2	7.03	12.5	1.64	647	1,106	–	80.4
21GC066	ABR	8/14/2023	18:25	3.8	7.12	5.0	0.64	501	819	2.06	-106
21GC066	ABR	9/25/2023	15:40	2.8	7.44	8.0	1.09	564	962	0.61	-118
21GC068	Katana	10/9/2021	13:25	2.16	6.09	55.4	–	4,676	8,296	163.3	–
21GC068	Katana	7/11/2022	18:30	2.8	5.82	–	10.50	4,795	8,340	7.4	20.8
21GC068	Katana	8/26/2022	11:45	3.25	8.24	–	2.03	4,745	8,119	14.1	-46
21GC068	Katana	9/13/2022	12:30	2.7	6.09	–	4.40	4,654	8,090	117.7	13
21GC068	ABR	6/29/2023	8:45	3.4	6.23	12.0	1.61	3,848	6,532	717	-24
21GC068	ABR	8/12/2023	12:15	3.4	6.20	10.0	1.33	4,141	6,583	720	-31
21GC068	ABR	9/23/2023	17:45	1.7	6.28	6.0	0.82	3,563	6,305	31.3	-34
21GC068	ABR	6/29/2024	11:20	3.7	6.24	8.5	1.08	2,962	4,977	275	17
21GC068	ABR	8/1/2024	16:46	2.4	6.29	8.4	1.12	2,990	5,214	87.2	45
21GC068	ABR	9/4/2024	10:00	2.1	6.33	18.7	2.59	2,968	5,086	380	58
21GC068	ABR	7/4/2025	11:40	2.3	6.53	–	5.78	2,557	4,513	3.96	30.9
21GC068	ABR	9/9/2025	14:45	2.1	6.41	31.5	4.28	2,302	4,095	62.3	-0.9
21GTW007	Katana	10/12/2021	19:22	1.62	5.05	116.6	–	286	517	–	–
21GTW007	Katana	7/11/2022	17:30	2.01	5.35	–	23.50	236	421	4.47	254.2
21GTW007	Katana	8/27/2022	15:15	2.15	7.19	–	12.42	253	441	0.05	26.9

Appendix B. Continued.

Site ID	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
21GTW007	Katana	9/12/2022	18:15	3.0	6.50	90.0	11.90	191	330	0.94	213.7
21GTW007	ABR	6/28/2023	10:30	4.1	6.36	79.0	9.70	283.3	472.2	2.43	
21GTW007	ABR	8/11/2023	10:20	4.3	6.34	84.0	10.89	295.4	470.7	1.94	266
21GTW007	ABR	9/23/2023	15:00	2.4	6.43	85.0	11.05	286.4	474.4	0.13	135
21GTW007	ABR	6/29/2024	9:15	4.8	6.29	–	9.51	342.1	555.8	0.36	385
21GTW007	ABR	8/4/2024	9:50	2.6	6.15	96.4	13.00	292.4	510.2	0.8	345
21GTW007	ABR	9/7/2024	11:40	2.1	6.06	96.0	13.15	252.6	447.2	0.78	335
21GTW007	ABR	7/8/2025	13:30	2.6	6.27	102.8	13.85	258.6	455.7	1.19	397.1
21GTW007	ABR	9/12/2025	13:40	2.2	6.35	74.3	10.26	310	550	1.02	150.9
22GC075	Katana	8/28/2022	13:25	1.43	10.63	–	3.55	4,692	8,542	1.6	-5.8
22GC075	Katana	9/13/2022	14:44	1.6	5.39	24.0	3.10	4,392	7,920	0.94	82.7
22GC075	ABR	8/13/2023	10:45	1.9	5.39	5.0	0.63	4,194	6,955	11.3	59
22GC075	ABR	9/23/2023	12:40	1.3	5.44	29.0	4.00	3,749	6,651	1.48	82
22GC075	ABR	6/30/2024	18:20	3.5	5.37	13.0	1.69	3,365	5,665	9.17	156
22GC075	ABR	8/3/2024	15:01	1.4	5.49	10.9	1.49	3,030	5,510	12.3	280
22GC075	ABR	9/6/2024	14:15	1.5	5.40	21.6	2.97	2,689	4,876	19.2	55
22GC075	ABR	9/9/2025	16:00	1.5	5.31	58.1	7.98	1,788	3,244	14.4	120.4
22GT008D	Katana	8/25/2022	17:10	5.96	6.70	–	11.10	798	1,253	1012	263.3
22GT008D	Katana	9/12/2022	12:20	3.59	7.18	67.4	8.84	899	1,523	39.64	246.2
22GT008D	ABR	7/1/2024	20:15	2.7	6.99	121.2	16.28	853	1,471	32.6	178
22GT008D	ABR	8/2/2024	19:00	4.3	7.01	110.6	14.32	511	828	311	275
22GT008D	ABR	9/12/2024	13:50	3.1	7.27	90.6	12.02	410.4	706.2	29.4	246
22GT008D	ABR	7/8/2025	17:40	7.1	6.80	105.9	13.29	883	1,427	1.59	286.5
22GT008D	ABR	9/7/2025	15:15	3.0	6.81	147.9	19.77	588	1,010	16.1	140.5
22GT008S	Katana	8/24/2022	16:45	4.77	7.38	–	6.72	1,030	1,682	1.83	237.6

Appendix B. Continued.

Site ID	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
22GT008S	Katana	9/12/2022	10:05	4.9	6.07	40.8	5.19	1,070	1,736	9.19	222.9
22GT008S	ABR	6/28/2023	21:50	2.1	7.00	62.0	8.53	250	443.9	8.46	164
22GT008S	ABR	8/12/2023	16:05	8.0	7.32	–	7.61	502	699	1.83	5
22GT008S	ABR	9/22/2023	16:25	5.9	7.09	58.0	7.33	391.1	611.6	0.96	154
22GT008S	ABR	6/30/2024	14:10	3.0	6.98	93.7	12.64	270.4	463.2	0.73	275
22GT008S	ABR	8/3/2024	10:50	2.9	6.89	96.3	12.98	355.5	605.5	1.88	315
22GT008S	ABR	9/8/2024	16:00	5.4	7.07	87.3	11.10	369.3	545	1.41	282
22GT008S	ABR	7/8/2025	14:35	1.6	6.94	94.1	12.96	237.2	429.4	1.46	345
22GT008S	ABR	9/9/2025	10:00	0.9	6.90	92.5	11.69	172	333	8.47	150.8
23GC099	ABR	9/29/2023	14:35	3.0	12.75	8.0	1.07	3,113	5,349	5.3	45
23GC099	ABR	8/10/2024	14:55	1.7	12.42	6.2	0.87	1,592	2,825	4.88	-55
23GC099	ABR	9/4/2024	16:30	3.0	12.14	5.5	0.73	1,253	2,155	9	-81
23GC099	ABR	7/9/2025	14:20	1.9	12.08	21.3	2.86	1,341	2,382	4.33	-111.3
23GC099	ABR	9/8/2025	15:45	2.4	11.83	15.0	2.04	1,238	2,175	4.81	-140.9
23GCT016	ABR	9/25/2023	14:20	2.1	9.43	41.0	5.60	281.1	490.1	14.1	-130
23GCT016	ABR	9/30/2023	18:50	1.1	9.56	34.0	4.79	357.6	638.6	70.3	-140
23GCT016	ABR	7/2/2024	13:10	2.0	6.14	83.4	11.48	308.1	543.5	19.3	346
23GCT016	ABR	8/7/2024	17:30	1.6	6.46	65.0	8.24	322.1	572.8	19	374
23GCT016	ABR	9/6/2024	12:00	1.1	7.06	67.5	9.50	404.6	741.7	11.5	127
23GCT016	ABR	9/9/2025	13:30	1.6	6.07	109.8	14.65	487.9	882	25.9	106
23GCT018	ABR	9/27/2023	19:00	3.3	10.84	50.0	6.72	235.8	400.5	1.14	139
23GCT018	ABR	8/6/2024	15:30	2.7	6.90	98.9	13.35	90.2	144.4	4.04	222
23GCT018	ABR	9/4/2024	13:25	2.5	9.66	62.5	8.52	237.7	339.9	2.91	55
23GCT018	ABR	9/8/2025	16:50	3.2	8.11	152.3	20.20	215.1	368.4	1.81	125.3
24GCT019	ABR	8/2/2024	17:30	3.8	9.17	7.0	0.91	727	1,210	2.22	16
24GCT019	ABR	9/3/2024	15:30	4.2	9.03	25.1	3.40	784	1,302	3.32	49
24GCT019	ABR	7/6/2025	17:20	15.6	8.52		4.36	1,295	1,579	0.42	59.5

Appendix B. Continued.

Site ID	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
24GCT019	ABR	9/11/2025	11:30	3.5	8.57	22.4	2.90	883	1,502	0.91	32.2
24GCT022	ABR	8/3/2024	9:30	1.8	7.26	101.3	14.12	231.9	416.8	1.84	301
24GCT022	ABR	7/11/2025	14:15	4.4	7.91	14.9	115.10	291	480	1.1	219.4
24GCT022	ABR	9/7/2025	13:30	4.5	7.91	153.5	19.30	305.6	496	2.68	126.3
24GCT026	ABR	8/5/2024	16:00	3.9	11.72	59.1	7.61	715	1173	–	-203
24GCT026	ABR	9/9/2024	20:55	3.9	9.81	88.7	11.57	125.6	211.4	14.3	129
24GCT026	ABR	7/7/2025	13:15	14.8	11.72	–	6.33	619	770	41.2	139.3
24GCT028	ABR	8/4/2024	17:07	4.0	6.40	10.1	1.30	2,478	4,114	2.64	144
24GCT028	ABR	7/10/2025	18:30	2.7	6.55	35.2	4.74	2,165	3,772	5.93	39.9
24GCT028	ABR	9/12/2025	20:45	3.7	6.76	55.7	6.05	2,387	3,847	4.66	2.5
24GCT029	ABR	8/4/2024	15:00	3.8	2.94	4.7	0.59	1,013	1,595	0.8	204
24GCT029	ABR	7/8/2025	10:35	3.5	2.95		5.07	1,148	1,998	0.44	400.9
24GCT029	ABR	9/8/2025	11:50	1.3	2.90	31.2	4.34	776	14.15	1.1	403.8
GR3[b]	ERM	7/26/2019	11:40	3.49	7.27	–	11.20	–	72	1,000	57.6
GR3[b]	ERM	8/29/2019	12:05	1.31	7.17	–	13.45	–	69	72.22	79.8
GR3[b]	Katana	8/5/2021	14:20	16.8	7.01	87.6	8.50	84	99.7	16.21	-6.7
GR3[b]	Katana	9/21/2021	17:40	5.4	7.02	104.6	13.23	71.1	113.7	7.53	4.5

[a] Former exploration drill site which became a seep and was eventually capped.
[b] Groundwater seep.

Appendix C. Ambient *in-situ* water quality conditions associated with surface water laboratory samples on streams of the Graphite Creek Project survey area near Teller, Alaska, 2014–2025.

Waterbody	Site ID[b]	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Cobblestone River	CO1	TetraTech	6/10/2014	16:30	8.3	7.35	–	–	65	–	–	–
Cobblestone River	CO1	TetraTech	7/29/2014	9:00	–	–	–	–	–	–	–	–
Cobblestone River	CO1	TetraTech	9/12/2014	10:30	8.2	7.78	–	–	106	–	–	–
Cobblestone River	CO1	Cal Craig	10/16/2015	14:20	-0.16	6.51	–	18.06	62	–	–	160.4
Cobblestone River	CO1	Cal Craig	5/25/2016	15:37	2.59	6.82	–	18.50	51	–	1.3	–
Cobblestone River	CO1	Cal Craig	8/24/2016	10:24	6.06	6.90	–	13.03	66	–	0.97	–
Cobblestone River	CO1	Cal Craig	8/10/2018	10:53	–	–	–	–	–	–	–	–
Cobblestone River	CO1	ERM	7/22/2019	15:40	10.71	7.70	–	11.78	–	133	0.63	7.28
Cobblestone River	CO1	ERM	8/28/2019	9:30	7.47	7.30	–	11.58	–	159	1.33	212.9
Cobblestone River	CO1	ERM	10/15/2019	14:30	-0.03	6.90	–	12.22	–	356	1.64	86.1
Cobblestone River	CO1	Katana	8/4/2021	17:35	13.8	7.48	105.9	10.95	113.8	144.9	0.8	137.1
Cobblestone River	CO1	Katana	9/21/2021	12:55	2.9	7.63	103.4	13.91	119.5	206.6	0.26	108.5
Cobblestone River	CO1	Katana	7/10/2022	10:25	10.4	6.75	120.0	13.63	110	153	0.05	157.1
Cobblestone River	CO1	Katana	8/22/2022	11:30	8.33	6.88	100.0	11.84	141	207	0	235.1
Cobblestone River	CO1	Katana	9/14/2022	10:30	5.6	7.15	102.0	12.80	65	110.5	0.21	146.1
Cobblestone River	CO1	ABR	6/26/2023	9:15	2.9	7.39	108.3	14.55	51.7	89.3	0.98	
Cobblestone River	CO1	ABR	8/10/2023	10:00	8.1	7.61	98.6	11.63	85	125.4	0.48	106
Cobblestone River	CO1	ABR	9/22/2023	9:15	2.9	7.60	98.1	13.25	95	164.6	0.66	215
Cobblestone River	CO1	ABR	6/26/2024	9:15	2.7	6.94	106.5	14.53	37.2	64.9	1.21	233
Cobblestone River	CO1	ABR	8/7/2024	10:10	5.5	7.11	96.9	12.17	63.7	101.4	1.34	326
Cobblestone River	CO1	ABR	9/7/2024	14:15	4.5	7.19	101.9	13.08	93.7	153.8	0.92	312
Cobblestone River	CO1	ABR	7/5/2025	10:45	10.8	7.72	138.6	15.25	9.75	133.7	1.08	129.1
Cobblestone River	CO1	ABR	9/11/2025	18:00	5.1	7.49	98.5	12.55	86.7	140.1	1.15	106.3
Cobblestone River	CO2	TetraTech	6/10/2014	15:50	8.1	7.11	–	–	65	–	–	–
Cobblestone River	CO2	TetraTech	7/29/2014	11:00	–	–	–	–	–	–	–	–
Cobblestone River	CO2	TetraTech	9/12/2014	9:30	8.6	7.45	–	–	125	–	–	–
Cobblestone River	CO2	Cal Craig	10/16/2015	16:03	0.03	6.48		16.70	74	–	–	161
Cobblestone River	CO2	Cal Craig	5/25/2016	16:08	2.56	6.97		17.50	72	–	1.6	–
Cobblestone River	CO2	Cal Craig	8/24/2016	11:30	7.94	7.15		11.51	94	–	0.75	–
Cobblestone River	CO2	Cal Craig	8/10/2018	11:56	–	–	–	–	–	–	–	–
Cobblestone River	CO2	ERM	7/23/2019	11:00	9.06	7.42	–	10.84	–	166	9.12	72.8
Cobblestone River	CO2	ERM	8/27/2019	14:45	10.66	8.04	–	12.08	–	177	1.12	3.8
Cobblestone River	CO2	ERM	10/15/2019	13:15	-0.06	6.37	–	7.49	–	392	68.91	114.1
Cobblestone River	CO2	Katana	8/4/2021	14:05	11.9	7.23	104.6	11.45	127.2	176.6	5.32	104.2
Cobblestone River	CO2	Katana	9/21/2021	9:30	2.1	6.72	89.4	12.30	161.8	285.6	0.55	158.6
Cobblestone River	CO2	Katana	7/10/2022	9:15	11.74	5.60	103.0	11.24	162	214	0.41	172.6
Cobblestone River	CO2	Katana	8/22/2022	10:00	6.03	6.53	108.0	13.40	114	178	0.005	262.6
Cobblestone River	CO2	Katana	9/14/2022	9:20	6.4	6.99	96.0	11.80	117	184.4	0.32	149.4
Cobblestone River	CO2	ABR	6/26/2023	10:35	5.2	7.29	102.0	12.75	83.3	133.8	1.33	172

Appendix C. Continued.

Waterbody	Site ID[b]	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Cobblestone River	CO2	ABR	8/10/2023	10:40	9.3	7.46	92.1	10.52	110.8	157.6	1.02	68
Cobblestone River	CO2	ABR	9/21/2023	17:40	5.9	7.44	103.7	12.99	121.6	190	0.66	121
Cobblestone River	CO2	ABR	6/26/2024	10:20	5.7	7.07	102.5	12.97	57.2	89.6	1.6	216
Cobblestone River	CO2	ABR	8/7/2024	10:45	7.4	6.92	93.9	11.20	89.1	134.1	4.4	285
Cobblestone River	CO2	ABR	9/7/2024	14:40	5.4	6.84	95.5	12.00	111.4	178.4	1.55	303
Cobblestone River	CO2	ABR	7/5/2025	11:50	10.9	7.76	132.4	14.62	97.7	133.7	0.95	120.4
Cobblestone River	CO2	ABR	9/11/2025	18:27	5.6	7.32	92.8	11.63	97.2	154.3	1.11	111.7
Graphite Creek	GR1	TetraTech	7/29/2014	13:40	–	–	–	–	–	–	–	–
Graphite Creek	GR1	TetraTech	9/12/2014	11:30	4.3	7.53	–	–	148	–	–	–
Graphite Creek	GR1	Cal Craig	10/16/2015	10:22	-0.18	5.67	–	18.27	106	–	–	204.5
Graphite Creek	GR1a		5/26/2016	12:10	0.25	6.54	–	18.05	66	–	1.8	–
Graphite Creek	GR1	Cal Craig	8/23/2016	13:22	3.07	7.16	–	14.07	78	–	2.43	–
Graphite Creek	GR1	Cal Craig	8/10/2018	12:50	–	–	–	–	–	–	–	–
Graphite Creek	GR1	ERM	7/23/2019	14:30	3.8	7.01	–	13.44	–	421	1.39	53.4
Graphite Creek	GR1	ERM	8/28/2019	12:10	3.7	7.99	–	14.38	–	1812	24.07	183.2
Graphite Creek	GR1	ERM	10/16/2019	10:20	0.19	4.93	–	13.26	–	6742	1.49	170.3
Graphite Creek	GR1	Katana	8/13/2021	16:35	3.6	5.41	101.0	13.32	409.5	692	2.47	262.9
Graphite Creek	GR1	Katana	9/22/2021	18:30	0.6	5.48	92.0	13.17	536	1005	3.73	216
Graphite Creek	GR1	Katana	7/10/2022	17:05	5.53	5.17	123.0	15.40	198	315	0.95	189.3
Graphite Creek	GR1	Katana	8/23/2022	20:15	2.41	6.26	108.0	14.70	252	443	1.78	228.7
Graphite Creek	GR1	Katana	9/14/2022	18:05	3.6	6.00	101.0	12.80	286	486	2.12	188.5
Graphite Creek	GR1	ABR	6/26/2023	14:20	1	7.16	111.0	15.60	93.1	172	1.15	194
Graphite Creek	GR1	ABR	8/10/2023	14:15	4.6	7.12	97.3	12.55	180.4	295.7	0.85	147
Graphite Creek	GR1	ABR	9/21/2023	16:00	2	6.99	103.3	14.26	272.6	486.6	0.84	174
Graphite Creek	GR1	ABR	6/29/2024	15:45	0.7	6.97	104.6	15.01	80.9	151.1	0.59	185
Graphite Creek	GR1	ABR	8/9/2024	17:15	1.4	6.99	101.2	14.24	123.8	225.4	0.99	387
Graphite Creek	GR1	ABR	9/6/2024	16:55	3	6.51	105.6	14.19	224.7	387.3	0.78	157
Graphite Creek	GR1	ABR	7/6/2025	11:45	3.9	6.92	109.2	14.30	123.8	207.4	1.09	120.8
Graphite Creek	GR1	ABR	9/11/2025	17:10	2.3	7.11	98.7	13.51	207.6	366.8	1.04	99.4
Graphite Creek	GR2	TetraTech	6/10/2014	12:20	4.2	7.19	–	–	92	–	–	–
Graphite Creek	GR2	TetraTech	7/28/2014	12:45	7.6	6.67	–	–		–	–	–
Graphite Creek	GR2	TetraTech	9/11/2014	12:15	8	7.42	–	–	194	–	–	–
Graphite Creek	GR2	Cal Craig	10/13/2015	10:38	-0.2	6.16	–	18.35	134	–	–	187.5
Graphite Creek	GR2	Cal Craig	5/26/2016	13:09	4.52	6.66	–	18.21	85	–	4.5	–
Graphite Creek	GR2	Cal Craig	8/23/2016	14:23	4.75	7.54	–	13.75	94	–	1.32	–
Graphite Creek	GR2	Cal Craig	8/10/2018	14:00	–	–	–	–	–	–	–	–
Graphite Creek	GR2	ERM	7/24/2019	13:00	5.51	5.98	–	13.09	–	540	3.24	73.3
Graphite Creek	GR2	ERM	8/29/2019	10:00	4.88	5.45	–	14.68	–	1906	16.8	219.7

Appendix C. Continued.

Waterbody	Site ID[b]	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Graphite Creek	GR2	ERM	10/14/2019	15:35	-0.8	5.01	–	11.45	–	2707	43.14	231.3
Graphite Creek	GR2	Katana	8/13/2021	12:50	3.9	3.87	102.5	13.41	641	1075	6.84	382.8
Graphite Creek	GR2	Katana	9/22/2021	16:35	1.6	4.15	96.9	13.45	717	1295	9.36	336.7
Graphite Creek	GR2	Katana	7/11/2022	12:00	6.58	5.08	132.0	16.20	264	408	2.2	248.6
Graphite Creek	GR2	Katana	8/23/2022	13:35	4.51	4.51	109.0	14.15	390	641	8.25	264.7
Graphite Creek	GR2	Katana	9/14/2022	15:05	6.7	4.77	101.0	12.20	428	659	12.72	194.4
Graphite Creek	GR2	ABR	6/27/2023	8:00	1.7	6.60	104.0	14.50	145.8	262.7	4.08	–
Graphite Creek	GR2	ABR	8/10/2023	9:00	4.2	5.50	102.3	13.32	227.8	377.2	4.91	182
Graphite Creek	GR2	ABR	9/21/2023	9:40	1.9	5.20	108.4	15.01	309.1	550	18.4	250
Graphite Creek	GR2	ABR	6/26/2024	18:20	2.5	6.33	122.3	16.67	62.1	108.8	20.8	189
Graphite Creek	GR2	ABR	8/5/2024	12:45	3.5	6.50	105.0	13.90	113.7	192.7	110	252
Graphite Creek	GR2	ABR	9/10/2024	11:00	4.1	5.25	103.8	13.63	259.8	432.6	29.5	311
Graphite Creek	GR2	ABR	7/3/2025	11:45	6.9	6.71	152.4	18.52	163.9	250.3	2.12	102.1
Graphite Creek	GR2	ABR	9/12/2025	10:00	1.7	5.28	94.7	13.20	264.6	477	6.02	159.4
Graphite Creek	GS1	Katana	8/13/2021	14:30	4.9	3.95	102.5	13.09	665	1080	8.66	397.2
Graphite Creek	GS1	Katana	9/22/2021	19:20	0.8	3.91	95.9	13.65	725	1348	13.78	371.6
Graphite Creek	GS1	Katana	7/10/2022	18:10	7.86	5.01	128.0	15.05	261	388	3.01	238.1
Graphite Creek	GS1	Katana	8/23/2022	16:20	5.31	4.11	107.0	13.21	413	662	7.38	338.6
Graphite Creek	GS1	Katana	9/14/2022	17:25	5.6	4.19	103.0	12.60	453	720	9.26	203.6
Graphite Creek	GS1	ABR	6/26/2023	15:45	1.8	6.69	114.0	15.80	117.6	211.3	2.77	138
Graphite Creek	GS1	ABR	8/10/2023	12:15	4.7	5.57	99.4	12.79	236.7	387.2	6.62	215
Graphite Creek	GS1	ABR	9/20/2023	17:45	2.5	5.07	101.4	13.72	343.1	602.4	8.08	194
Graphite Creek	GS1	ABR	6/25/2024	18:20	0.7	6.63	110.8	15.90	63	118.2	7.99	181
Graphite Creek	GS1	ABR	7/31/2024	15:15	4.2	6.29	102.5	13.31	162.7	269		247
Graphite Creek	GS1	ABR	9/4/2024	17:05	5.5	4.80	104.6	13.18	322	513	5.55	235
Graphite Creek	GS1	ABR	7/3/2025	14:50	9.4	6.92	145.1	16.58	171.9	244.7	2.13	86.4
Graphite Creek	GS1	ABR	9/11/2025	15:40	2.8	5.11	106.0	14.28	278	482	7.85	144
Glacier Canyon Creek	PT1	TetraTech	7/28/2014	14:40	6.3	6.66	–	–	–	–	–	–
Glacier Canyon Creek	PT1	TetraTech	9/12/2014	12:45	5.8	7.13	–	–	358	–	–	–
Glacier Canyon Creek	PT1	Cal Craig	10/16/2015	11:30	-0.1	5.22	–	18.06	228	–	–	202.8
Glacier Canyon Creek	PT1a	Cal Craig	5/25/2016	14:33	0.84	5.13	–	18.40	313	–	4.5	–
Glacier Canyon Creek	PT1	Cal Craig	8/23/2016	12:30	3.86	7.28	–	14.15	129	–	1.1	–
Glacier Canyon Creek	PT1	Cal Craig	8/9/2018	15:06	–	–	–	–	–	–	–	–
Glacier Canyon Creek	PT1	ERM	7/25/2019	14:50	5.21	5.77	–	12.41	–	623	14.85	53.2
Glacier Canyon Creek	PT1	ERM	8/28/2019	13:55	6.45	7.91	–	13.18	–	1660	6.28	161
Glacier Canyon Creek	PT1	ERM	10/16/2019	12:40	-0.15	4.99	–	8.58	–	6573	41.77	150.4
Glacier Canyon Creek	PT1	Katana	8/13/2021	10:45	2.2	5.40	97.4	13.37	549	973	2.3	242.2
Glacier Canyon Creek	PT1	Katana	9/22/2021	15:55	1.5	5.40	99.8	13.92	633	1149	1.59	278.6
Glacier Canyon Creek	PT1	Katana	7/10/2022	15:25	4.15	5.23	127.0	15.70	247	411	0.63	225.1

Appendix C. Continiued.

Waterbody	Site IDb	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Glacier Canyon Creek	PT1	Katana	8/23/2022	18:25	4.8	5.50	100.0	12.94	372	605	0.68	243.6
Glacier Canyon Creek	PT1	Katana	9/14/2022	16:45	4.9	5.17	102.0	12.60	533	864	1.78	760.6
Glacier Canyon Creek	PT1a	ABR	6/27/2023	10:15	0.6	5.73	104.0	14.90	288	540	3.5	284
Glacier Canyon Creek	PT1	ABR	8/10/2023	15:10	6.1	6.44	99.1	12.28	297.9	467	1.69	172
Glacier Canyon Creek	PT1	ABR	9/21/2023	12:40	2.1	6.15	104.6	14.41	387	687.9	2.43	190
Glacier Canyon Creek	PT1a	ABR	6/28/2024	16:05	0.6	5.73	105.3	15.13	174.5	327	3.04	348
Glacier Canyon Creek	PT1	ABR	8/9/2024	16:05	3.0	6.72	104.0	13.99	272.2	470.4	2.6	428
Glacier Canyon Creek	PT1	ABR	9/6/2024	17:45	3.7	5.68	107.5	14.19	344	580.4	2.55	252
Glacier Canyon Creek	PT1	ABR	7/6/2025	10:55	1.2	5.99	113.6	16.02	171.9	315.2	1.16	162
Glacier Canyon Creek	PT1	ABR	9/11/2025	16:40	3.1	5.81	101.0	13.52	377.4	649	2.71	129.8
Glacier Canyon Creek	PT2	TetraTech	6/10/2014	13:20	3.4	6.74	–	–	261	–	–	–
Glacier Canyon Creek	PT2	TetraTech	7/28/2014	10:15	5.6	7.57	–	–	–	–	–	–
Glacier Canyon Creek	PT2	TetraTech	9/11/2014	13:15	7.4	6.22	–	–	488	–	–	–
Glacier Canyon Creek	PT2	Cal Craig	10/13/2015	12:04	0.4	5.25	–	17.89	295	–	–	195.7
Glacier Canyon Creek	PT2	Cal Craig	5/26/2016	13:55	4.4	5.07	–	17.90	252	–	11.3	–
Glacier Canyon Creek	PT2	Cal Craig	8/23/2016	10:23	4.36	7.05	–	13.72	149	–	2.79	–
Glacier Canyon Creek	PT2	Cal Craig	8/10/2018	15:17	–	–	–	–	–	–	–	–
Glacier Canyon Creek	PT2	ERM	7/24/2019	13:55	6.76	5.83	–	13.25	–	1048	6.24	45.9
Glacier Canyon Creek	PT2	ERM	8/27/2019	10:00	6.6	5.10	–	13.10	–	2552	1.52	341.8
Glacier Canyon Creek	PT2	ERM	10/13/2019	17:00	1.43	5.10	–	14.07	–	4008	0.16	288.9
Glacier Canyon Creek	PT2	Katana	8/13/2021	8:20	2.6	5.01	101.9	13.76	880	1535	0.75	334.7
Glacier Canyon Creek	PT2	Katana	9/22/2021	13:40	1.7	4.99	99.5	13.31	1019	1837	1.39	282.7
Glacier Canyon Creek	PT2	Katana	7/11/2022	10:35	5.21	5.12	126.0	16.10	464	746	0.9	260
Glacier Canyon Creek	PT2	Katana	8/23/2022	17:15	6.57	5.02	103.0	12.68	735	1134	11.59	258.3
Glacier Canyon Creek	PT2	Katana	9/14/2022	14:30	6.3	4.97	101.0	12.30	744	1158	1.39	215.4
Glacier Canyon Creek	PT2	ABR	6/26/2023	16:45	1.8	6.09	113.0	15.70	234.7	421.6	3.48	232
Glacier Canyon Creek	PT2	ABR	8/10/2023	13:10	6.3	5.25	101.6	12.51	493.1	765.7	2.71	231
Glacier Canyon Creek	PT2	ABR	9/21/2023	11:40	2.4	5.12	107.1	14.62	554	976	3.1	248
Glacier Canyon Creek	PT2	ABR	6/28/2024	17:30	1.7	5.95	106.5	14.82	176.6	317.9	4.81	319
Glacier Canyon Creek	PT2	ABR	8/5/2024	13:35	3.9	6.09	96.5	12.60	246.5	412.5	4.74	316
Glacier Canyon Creek	PT2	ABR	9/10/2024	11:50	4.3	5.22	104.0	13.48	448.9	741.4	8.05	378
Glacier Canyon Creek	PT2	ABR	7/4/2025	16:30	7.1	5.61	107.9	13.03	275.1	418.1	2.55	182.9
Glacier Canyon Creek	PT2	ABR	9/10/2025	17:00	3.1	5.22	103.2	13.74	460.9	793	2.44	168.9
Glacier Canyon Creek	PT3	ABR	7/11/2025	9:20	4.9	6.15	83.1	10.61	200.2	325.3	2.09	177.6
Glacier Canyon Creek	PT3	ABR	9/12/2025	9:50	1.9	5.18	99.1	13.69	336	575	4.66	176.5
Ruby Creek	RB1	TetraTech	7/29/2014	15:00	–	–	–	–	–	–	–	–
Ruby Creek	RB1	TetraTech	9/11/2014	14:15	9.6	4.88	–	–	591	–	–	–
Ruby Creek	RB1	Cal Craig	10/16/2015	13:16	-0.19	4.57	–	17.95	303	–	–	230.9
Ruby Creek	RB1a	Cal Craig	5/26/2016	11:22	-0.04	5.50	–	17.60	140	–	10.3	
Ruby Creek	RB1	Cal Craig	8/23/2016	11:23	4.48	4.84	–	13.32	280	–	2.17	

Appendix C. Continued.

Waterbody	Site ID[b]	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Ruby Creek	RB1	ERM	7/24/2019	15:50	3.2	6.95	–	14.74	–	1,271	1.89	49.5
Ruby Creek	RB1	ERM	8/28/2019	16:50	8.49	6.78	–	11.48	–	2,783	16.77	79.6
Ruby Creek	RB1	ERM	10/16/2019	14:25	-0.18	4.31	–	7.45	–	6,715	3.81	176.7
Ruby Creek	RB1	Katana	8/5/2021	17:55	3.0	4.37	102.0	13.65	953	1,642	0.56	453.8
Ruby Creek	RB1	Katana	9/21/2021	12:35	0.9	3.99	99.7	14.10	1390	2,577	0	460.5
Ruby Creek	RB1	Katana	7/11/2022	13:00	5.92	4.82	125.0	15.50	676	1,064	0.17	234
Ruby Creek	RB1	Katana	8/22/2022	17:00	5.73	4.59	102.0	12.74	1092	1,729	0	278.1
Ruby Creek	RB1	ABR	9/14/2022	13:50	6.3	4.56	99.0	11.90	1169	1,815	0.01	231.2
Ruby Creek	RB1	ABR	6/27/2023	9:00	0.7	5.01	104.0	14.90	461.3	862	1.06	272
Ruby Creek	RB1a	ABR	8/10/2023	15:50	4.2	5.02	100.3	13.03	678	1,125	0.29	253
Ruby Creek	RB1a	ABR	9/21/2023	15:00	2.2	4.85	101.3	13.46	884	1,514	0.28	232
Ruby Creek	RB1	ABR	6/26/2024	17:00	0.7	5.17	119.1	17.10	251.9	471	2.03	335
Ruby Creek	RB1	ABR	7/31/2024	16:40	3.1	5.07	103.6	13.85	463.6	796	–	411
Ruby Creek	RB1a	ABR	9/7/2024	10:50	2	4.92	99.7	13.73	743	1,323	0.44	312
Ruby Creek	RB1a	ABR	7/3/2025	14:00	9.6	5.06	147.1	16.74	618	877	1.46	184.9
Ruby Creek	RB1	ABR	9/10/2025	19:00	2.8	5.01	95.5	12.89	632	1,099	1.24	185.3
Trail Creek	TR1	TetraTech	7/30/2014	9:50	–	–	–	–	–	–	–	–
Trail Creek	TR1	Cal Craig	10/13/2015	13:05	0.83	6.53	–	17.31	224	–		118.7
Trail Creek	TR1	Cal Craig	5/25/2016	13:34	0.92	6.47	–	17.20	259	–	2.9	–
Trail Creek	TR1	Cal Craig	8/23/2016	15:00	4.54	7.52	–	13.81	141	–	0.62	–
Trail Creek	TR1	Cal Craig	8/10/2018	15:42	–	–	–	–	–	–	–	–
Trail Creek	TR1	ERM	7/25/2019	12:40	4.89	5.92	–	12.91	–	644	4.98	120.9
Trail Creek	TR1	ERM	8/28/2019	15:30	7.95	7.29	–	11.86	–	1220	8.62	108.5
Trail Creek	TR1	ERM	10/15/2019	10:15	-0.14	4.67	–	12.63	–	3840	20.22	191.2
Trail Creek	TR1	Katana	8/5/2021	15:45	6.6	6.54	101.5	12.42	568	876	4.58	129.2
Trail Creek	TR1	Katana	9/21/2021	18:40	1.5	5.43	104.0	14.51	703	1275	10.86	133.3
Trail Creek	TR1	Katana	7/10/2022	13:42	5.91	6.10	145.0	16.70	431	678	2.95	124.5
Trail Creek	TR1	Katana	8/22/2022	15:05	7.19	6.08	105.0	12.72	497	753	6.14	194.5
Trail Creek	TR1	Katana	9/14/2022	12:00	4.9	5.36	102.0	12.80	533	863	10.13	117.1
Trail Creek	TR1	ABR	6/27/2023	11:10	1.6	6.46	103.0	14.30	306.7	554	4.2	169
Trail Creek	TR1	ABR	8/10/2023	13:40	6.1	7.09	101.2	12.53	376.1	588.3	4.78	67
Trail Creek	TR1	ABR	9/21/2023	13:30	2.9	6.08	105.7	14.24	464.9	802.5	10	159
Trail Creek	TR1	ABR	6/28/2024	15:00	1.6	6.21	105.5	14.74	206.4	373.3	4.43	196
Trail Creek	TR1	ABR	8/7/2024	8:55	2.6	6.68	104.6	14.21	275.6	482	3.84	305
Trail Creek	TR1	ABR	9/8/2024	17:40	5.7	5.42	104.8	13.12	462.2	733.5	9.87	352
Trail Creek	TR1	ABR	7/6/2025	13:05	7.4	6.96	113.4	13.53	352.9	531	2.08	64.6
Trail Creek	TR1	ABR	9/11/2025	17:40	3.4	5.85	99.9	13.26	406.5	692	7.91	51.5

Appendix C. Continued.

Waterbody	Site ID[b]	Contractor	Date	Time	Temp. (C°)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
Unnamed Creek A	UCA1	TetraTech	6/10/2014	14:50	4.0	6.32	–	–	42	–	–	–
Unnamed Creek A	UCA1	TetraTech	7/28/2014	16:30	–	–	–	–	–	–	–	–
Unnamed Creek A	UCA1	TetraTech	9/11/2014	15:15	6.6	6.76	–	–	56	–	–	–
Unnamed Creek A	UCA1	ERM	7/23/2019	12:55	9.95	7.00	–	9.91	–	67	6.95	44.1
Unnamed Creek A	UCA1	ERM	8/29/2019	9:20	7.14	6.17	–	11.16	–	80	9.75	128.7
Unnamed Creek A	UCA1	ERM	10/14/2019	10:00	0.06	7.30	–	12.54	–	90	3.61	123.9
Unnamed Creek A	UCA1	Katana	8/5/2021	12:10	9.8	6.67	88.2	10.00	53.6	75.6	2.98	62.6
Unnamed Creek A	UCA1	Katana	9/21/2021	16:00	2.8	6.82	90.9	12.29	53.8	93.4	1.94	64
Unnamed Creek A	UCA1	Katana	7/10/2022	12:10	7.45	6.13	120.0	14.10	57	87	5.13	82.1
Unnamed Creek A	UCA1	Katana	8/22/2022	13:30	6.24	6.09	93.0	11.50	55	84	15.03	190.1
Unnamed Creek A	UCA1	Katana	9/14/2022	11:10	5.6	6.46	85.0	10.60	53	85.3	3.23	123.2
Unnamed Creek A	UCA1	ABR	6/26/2023	12:15	4.9	6.91	130.0	16.40	39.7	64.4	9.99	86
Unnamed Creek A	UCA1	ABR	8/10/2023	11:30	8.4	7.03	85.6	10.03	49.2	71.9	10.6	12
Unnamed Creek A	UCA1	ABR	9/22/2023	10:40	2.4	6.84	88.1	12.05	46.1	78.3	2.87	60
Unnamed Creek A	UCA1	ABR	6/26/2024	12:30	4.7	6.74	107.4	13.82	37	60.4	6.5	102
Unnamed Creek A	UCA1	ABR	8/7/2024	11:40	7.1	6.45	91.6	11.06	35.2	53.3	25.4	279
Unnamed Creek A	UCA1	ABR	9/7/2024	14:55	4.9	6.16	76.2	9.72	50	81.1	4.78	306
Unnamed Creek A	UCA1	ABR	7/5/2025	9:45	7.9	6.31	89.7	10.54	53.3	79	4.14	100.3
Unnamed Creek A	UCA1	ABR	9/11/2025	9:20	3.2	6.42	98.5	13.17	50.4	86.5	29.3	116.5
Unnamed Creek	UCX1[a]	Cal Craig	10/13/2015	13:57	0.51	6.30	–	17.57	126	–	–	100.2
Unnamed Creek	UCX1[a]	Cal Craig	5/25/2016	12:09	1.41	5.77	–	17.40	144	–	4.2	
Unnamed Creek	UCX1[a]	Cal Craig	8/24/2016	13:03	3.36	6.56	–	14.75	92	–	1.85	–
Unnamed Creek	UCX1[a]	Cal Craig	8/9/2018	15:01	–	–	–	–	–	–	–	–
Unnamed Creek B	UCB1	ABR	6/26/2024	14:30	7.1	7.21	117.9	14.26	200.3	304.4	48.7	109
Unnamed Creek B	UCB1	ABR	8/9/2024	18:00	4.5	7.25	103.3	13.39	268.1	443.6	5.7	321
Unnamed Creek B	UCB1	ABR	9/7/2024	15:30	4.4	7.47	98.1	12.69	327.3	539.5	3.04	307
Unnamed Creek B	UCB1	ABR	7/5/2025	12:25	6.1	7.46	128.9	15.95	380.2	596	23.8	52.7
Unnamed Creek B	UCB1	ABR	9/11/2025	9:35	2.1	7.24	93.7	12.89	289.7	515	11.9	115.7
Unnamed Creek B	UCB2	ABR	6/26/2024	15:45	6.5	7.22	116.9	14.34	239.3	369.8	26.6	131
Unnamed Creek B	UCB2	ABR	8/7/2024	12:20	5.4	7.32	101.3	12.79	217.8	348.3	12.9	235
Unnamed Creek B	UCB2	ABR	9/7/2024	15:50	4.5	7.26	99.0	12.80	306.6	503.7	4.04	262
Unnamed Creek B	UCB2	ABR	7/5/2025	12:55	6.8	7.54	129.1	15.69	395.4	606	14.2	69.1
Unnamed Creek B	UCB2	ABR	9/11/2025	10:00	2.4	7.27	91.5		266.2	469.1	3.83	113.5

[a] Unnamed Creek sampled in 2015, 2016, and 2018
[b] A lower case 'a' at the end of a Site ID refers to an alternate site slightly upstream or downstream of the original site location.

Appendix D. Ambient *in-situ* water quality conditions associated with water laboratory samples on the Imuruk Basin of the Graphite Creek Project survey area near Teller, 2022–2025. Salinity values for 2022 were not directly measured in the field. These values were calculated from field temperature and conductivity.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM04	Katana	8/19/2022	9:57	0.3	1.0	–	–	–	–	–	–	–	18.55	–
IM04	Katana	8/19/2022	9:57	0.9	3.0	9.98	1.96	6.77	93.9	10.50	2,640	3,692	–	175.1
IM04	Katana	8/19/2022	9:57	1.8	6.0	10.10	2.03	6.34	91.7	10.18	2,739	3,741	–	186.5
IM01	Katana	8/19/2022	10:55	0.3	1.0	–	–	–	–	–	–	–	7.03	–
IM01	Katana	8/19/2022	10:55	0.9	3.0	10.01	2.50	7.10	96.8	10.75	3,326	4,656	–	159.5
IM01	Katana	8/19/2022	10:55	1.8	6.0	9.96	2.52	6.92	96.5	10.71	3,342	4,691	–	172.9
IM02	Katana	8/19/2022	12:15	0.3	1.0	–	–	–	–	–	–	–	8.21	–
IM02	Katana	8/19/2022	12:15	1.2	4.0	10.13	3.10	7.31	93.6	10.32	4,077	5,694	–	143.4
IM02	Katana	8/19/2022	12:15	2.4	8.0	10.15	3.08	7.27	92.6	10.22	4,058	5,668	–	140.0
IM02	Katana	8/19/2022	12:15	3.7	12.0	10.10	10.69	6.81	84.2	8.82	12,926	18,140	–	163.1
IM02	Katana	8/19/2022	12:15	4.6	15.0	10.12	11.37	6.73	83.2	8.67	13,692	19,220	–	170.1
IM02	Katana	8/19/2022	12:15	5.5	18.0	10.12	11.37	6.59	86.0	8.92	13,692	19,140	–	181.4
IM03	Katana	8/19/2022	13:55	0.9	3.0	10.48	2.90	7.56	95.4	10.46	3,871	5,354	–	113.1
IM03	Katana	8/19/2022	13:55	1.8	6.0	10.25	2.90	7.46	92.8	10.21	3,844	5,352	–	115.6
IM03	Katana	8/19/2022	13:55	2.7	9.0	10.06	3.13	7.39	89.2	9.87	4,105	5,756	–	120.1
IM03	Katana	8/19/2022	13:55	3.7	12.0	10.07	6.89	6.59	87.1	9.21	8,596	12,200	–	156.5
IM03	Katana	8/19/2022	13:55	4.0	13.3	10.10	8.75	6.92	81.2	15.13	10,747	15,100	–	142.2
IM06	Katana	8/19/2022	15:00	0.9	3.0	10.31	2.10	6.45	97.8	10.81	2,838	3,938	–	180.3
IM06	Katana	8/19/2022	15:00	1.8	6.0	10.09	2.17	6.48	94.1	10.50	2,916	4,050	–	183.8
IM06	Katana	8/19/2022	15:00	3.7	12.0	10.04	2.69	6.17	84.1	9.29	3,560	4,983	–	196.6
IM05	Katana	8/19/2022	16:05	0.9	3.0	10.86	2.55	5.10	96.2	10.47	3,456	4,733	–	244.2
IM05	Katana	8/19/2022	16:05	1.8	6.0	10.56	2.54	5.04	94.7	10.40	3,425	4,731	–	245.0
IM05	Katana	8/19/2022	16:05	2.7	9.0	10.23	2.54	4.97	91.6	10.12	3,396	4,730	–	247.1
IM05	Katana	8/19/2022	16:05	3.7	12.0	10.22	4.24	4.50	75.8	8.36	5,486	7,541	–	277.2
IM09	Katana	8/20/2022	9:40	0.9	3.0	10.36	2.03	4.12	98.3	10.87	2,752	3,825	–	278.8

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM09	Katana	8/20/2022	9:40	1.8	6.0	10.35	2.07	4.00	97.2	10.75	2,806	3,930	–	286.6
IM09	Katana	8/20/2022	9:40	2.7	9.0	10.10	2.51	3.66	93.6	10.33	3,344	4,668	–	304.6
IM12	Katana	8/20/2022	10:40	0.9	3.0	10.37	0.70	4.18	94.2	10.49	1,002	1,378	–	267.1
IM12	Katana	8/20/2022	10:40	1.8	6.0	10.58	1.12	4.13	93.1	10.30	1,576	2,188	–	273.6
IM12	Katana	8/20/2022	10:40	2.7	9.0	10.22	2.01	3.79	87.9	9.75	2,719	3,778	–	291.1
IM11	Katana	8/20/2022	11:45	0.9	3.0	10.62	1.34	4.32	96.4	10.64	1,872	2,580	–	258.2
IM11	Katana	8/20/2022	11:45	1.8	6.0	10.58	1.77	4.28	96.3	10.60	2,433	3,357	–	263.9
IM11	Katana	8/20/2022	11:45	2.7	9.0	10.62	1.77	4.08	91.7	10.11	2,440	3,362	–	283.0
IM10	Katana	8/20/2022	12:42	0.9	3.0	10.57	1.69	4.27	91.5	10.09	2,330	3,223	–	253.5
IM10	Katana	8/20/2022	12:42	1.8	6.0	10.22	1.94	4.18	88.4	9.80	2,626	3,658	–	256.1
IM10	Katana	8/20/2022	12:42	2.4	8.0	10.25	2.14	3.70	81.9	9.08	2,887	4,021	–	257.9
IM08	Katana	8/20/2022	14:10	0.9	3.0	11.60	2.16	4.35	95.0	10.14	3,019	4,043	–	257.3
IM08	Katana	8/20/2022	14:10	1.8	6.0	10.20	2.14	4.14	91.1	10.11	2,886	4,023	–	263.1
IM08	Katana	8/20/2022	14:10	2.7	9.0	10.10	2.21	3.82	81.0	8.99	2,970	4,151	–	272.6
IM07	Katana	8/20/2022	15:00	1.1	3.5	10.34	1.96	4.03	85.9	9.50	2,666	3,704	–	271.4
IM07	Katana	8/20/2022	15:00	2.0	6.5	10.26	2.12	3.46	79.4	8.83	2,865	3,988	–	284.8
IM02	Katana	8/21/2022	11:20	2.0	6.6	–	–	–	–	–	–	–	–	–
IM02	Katana	8/21/2022	11:20	5.0	16.4	–	–	–	–	–	–	–	–	–
IM07	Katana	8/21/2022	14:00	1.0	3.3	–	–	–	–	–	2,107	–	–	–
IM07	Katana	8/21/2022	14:00	2.0	6.6	–	–	–	–	–	–	–	–	–
IM07	Katana	9/12/2022	15:15	1.0	3.3	10.15	3.49	9.10	99.3	10.92	4,561	6,367	6.1	–
IM07	Katana	9/12/2022	15:15	3.0	9.8	9.67	4.28	8.92	92.5	10.24	5,457	7,724	8.59	197.7
IM02	Katana	9/12/2022	16:45	2.0	6.6	–	–	–	–	–	–	–	4.63	–
IM02	Katana	9/12/2022	16:45	5.0	16.4	–	–	–	–	–	–	–	9.73	–
IM04	Katana	9/13/2022	12:15	0.3	1.0	9.65	4.39	6.63	104.5	11.56	5,588	7,923	3.37	156.6
IM04	Katana	9/13/2022	12:15	0.9	3.0	9.82	4.96	6.60	103.2	11.34	6,291	8,893	3.37	160.7
IM04	Katana	9/13/2022	12:15	1.8	6.0	9.84	5.10	5.93	102.9	11.30	6,459	9,091	3.37	171.4

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM01	Katana	9/13/2022	13:35	0.3	1.0	9.90	4.74	6.79	113.7	12.48	6,044	8,486	3.76	183.2
IM01	Katana	9/13/2022	13:35	0.9	3.0	9.89	4.98	6.84	111.2	12.16	6,326	8,894	–	176.2
IM01	Katana	9/13/2022	13:35	1.8	6.0	9.87	5.04	6.84	108.9	11.93	6,395	8,993	–	168.2
IM02	Katana	9/13/2022	14:15	0.3	1.0	9.99	3.78	5.85	104.8	11.56	4,898	6,893	2.79	194.4
IM02	Katana	9/13/2022	14:15	1.8	6.0	9.99	4.00	6.77	106.9	11.73	5,171	7,335	–	177.9
IM02	Katana	9/13/2022	14:15	5.5	18.0	9.62	10.91	6.53	95.2	10.09	13,010	18,240	–	182.1
IM05	Katana	9/13/2022	15:40	0.9	3.0	10.12	4.67	6.37	118.7	12.97	5,991	8,372	2.83	209.7
IM05	Katana	9/13/2022	15:40	1.8	6.0	9.83	4.72	6.54	113.8	12.50	6,002	8,449	–	195.2
IM05	Katana	9/13/2022	15:40	2.7	9.0	9.74	4.95	6.41	106.8	11.71	6,268	8,910	–	191.5
IM05	Katana	9/13/2022	15:40	3.7	12.0	9.63	9.73	6.25	95.7	10.22	11,710	16,580	–	195.9
IM07	Katana	9/13/2022	16:10	1.1	3.5	10.02	3.60	NR	108.3	11.91	4,680	6,589	3.74	194
IM07	Katana	9/13/2022	16:10	2.0	6.5	10.22	4.30	NR	94.3	10.36	5,558	7,750	–	186.2
IM03	Katana	9/13/2022	16:45	0.9	3.0	10.07	3.83	NR	96.2	10.55	4,974	6,960	2.65	209.9
IM03	Katana	9/13/2022	16:45	1.8	6.0	10.00	3.86	NR	105.7	11.67	4,994	4,994	–	207.1
IM03	Katana	9/13/2022	16:45	2.7	9.0	9.85	3.97	NR	105.9	11.68	5,109	5,109	–	207.3
IM03	Katana	9/13/2022	16:45	4.2	13.8	9.52	15.24	NR	95.9	9.90	17,668	17,668	–	226.4
IM06	Katana	9/13/2022	17:45	0.9	3.0	10.26	2.30	NR	119.3	13.20	3,094	4,303	2.88	261.7
IM06	Katana	9/13/2022	17:45	1.8	6.0	10.02	2.31	NR	115.8	12.89	3,089	4,330	–	251
IM06	Katana	9/13/2022	17:45	2.7	9.0	9.92	3.40	NR	110.2	12.20	4,422	6,189	–	247
IM09	Katana	9/14/2022	10:40	0.9	3.0	10.19	4.54	NR	113.8	12.43	5,850	8,138	2.32	276.8
IM09	Katana	9/14/2022	10:40	1.8	6.0	9.87	5.84	NR	107.0	11.61	7,328	1,030	–	287.6
IM09	Katana	9/14/2022	10:40	2.7	9.0	9.79	5.99	NR	108.9	11.90	7,489	1,055	–	295.1
IM12	Katana	9/14/2022	11:50	0.9	3.0	10.31	3.51	NR	114.8	12.59	4,602	6,316	2.09	291.2
IM12	Katana	9/14/2022	11:50	1.8	6.0	10.32	3.95	NR	117.0	12.76	5,152	7,159	–	295.3
IM12	Katana	9/14/2022	11:50	2.7	9.0	10.17	4.24	NR	124.1	13.63	5,484	7,689	–	304.4
IM11	Katana	9/14/2022	12:45	0.9	3.0	10.32	3.79	NR	105.5	11.03	4,952	7,001	2.13	215.3
IM11	Katana	9/14/2022	12:45	1.8	6.0	10.24	4.18	NR	107.5	11.63	5,420	7,570	–	225.2

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM11	Katana	9/14/2022	12:45	2.7	9.0	10.06	4.68	NR	97.4	10.61	5,992	8,286	–	260.6
IM10	Katana	9/14/2022	14:20	0.9	3.0	10.00	4.61	NR	88.3	9.62	5,895	8,270	2.91	212.1
IM10	Katana	9/14/2022	14:20	1.8	6.0	10.02	4.86	NR	85.5	9.37	6,203	8,693	–	211
IM10	Katana	9/14/2022	14:20	2.7	9.0	10.02	4.88	NR	84.6	9.31	6,225	8,721	–	214.9
IM08	Katana	9/14/2022	15:10	0.9	3.0	10.22	5.01	NR	99.4	10.81	6,414	8,937	4.65	194.8
IM08	Katana	9/14/2022	15:10	1.8	6.0	10.18	5.04	NR	94.1	10.22	6,443	8,988	–	181.2
IM08	Katana	9/14/2022	15:10	2.7	9.0	10.13	5.10	NR	89.9	9.70	6,505	9,086	–	170.4
IM04a	ABR	6/29/2023	12:10	0.0	0.0	14.0	0.33	7.91	114.5	11.50	532	675	–	–
IM04a	ABR	6/29/2023	12:10	0.5	1.6	13.0	0.33	–	–	–	–	–	–	–
IM04a	ABR	6/29/2023	12:10	1.0	3.3	12.5	0.34	8.11	115.7	12.34	521	685	–	–
IM04a	ABR	6/29/2023	12:10	1.5	4.9	12.3	0.35	–	–	–	–	–	–	–
IM04a	ABR	6/29/2023	12:10	2.0	6.6	12.1	0.34	8.18	105.2	11.67	529	702	–	–
IM04a	ABR	6/29/2023	12:10	2.5	8.2	12.0	0.36	–	–	–	–	–	–	–
IM05a	ABR	6/29/2023	12:45	0.0	0.0	13.4	0.30	8.06	102.7	10.72	470.8	604.3	–	–
IM05a	ABR	6/29/2023	12:45	0.5	1.6	13.3	0.30	–	–	–	–	–	–	–
IM05a	ABR	6/29/2023	12:45	1.0	3.3	13.0	0.30	8.07	96.8	10.03	470.2	609.9	–	–
IM05a	ABR	6/29/2023	12:45	1.5	4.9	12.8	0.30	–	–	–	–	–	–	–
IM05a	ABR	6/29/2023	12:45	2.0	6.6	12.6	0.30	8.05	94.7	10.10	470.2	616.3	–	–
IM05a	ABR	6/29/2023	12:45	2.5	8.2	12.4	0.31	–	–	–	–	–	–	–
IM05a	ABR	6/29/2023	12:45	3.0	9.8	12.3	0.31	8.01	96.4	10.27	479.1	631.8	–	–
IM05a	ABR	6/29/2023	12:45	3.5	11.5	12.3	0.31	–	–	–	–	–	–	–
IM05a	ABR	6/29/2023	12:45	4.0	13.1	12.0	0.32	7.89	89.5	9.63	497.5	663	–	–
IM01a	ABR	6/29/2023	13:50	0.0	0.0	13.8	0.31	7.91	113.3	11.77	498.5	634.4	–	–
IM01a	ABR	6/29/2023	13:50	0.5	1.6	13.6	0.31	–	–	–	–	–	–	–
IM01a	ABR	6/29/2023	13:50	1.0	3.3	13.2	0.32	7.94	106.9	11.20	499.7	645.4	–	–
IM01a	ABR	6/29/2023	13:50	1.5	4.9	12.7	0.32	–	–	–	–	–	–	–
IM01a	ABR	6/29/2023	13:50	2.0	6.6	12.3	0.32	7.97	95.5	10.12	501	662	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM01a	ABR	6/29/2023	13:50	2.5	8.2	12.2	0.33	–	–	–	–	–	–	–
IM01a	ABR	6/29/2023	13:50	3.0	9.8	12.5	0.33	7.96	99.5	10.45	604	667	–	–
IM01a	ABR	6/29/2023	13:50	3.5	11.5	12.2	0.33	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	0.0	0.0	14.3	0.32	8.13	130.2	12.71	515	645	–	–
IM02	ABR	6/29/2023	15:30	0.5	1.6	13.5	0.32	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	1.0	3.3	12.9	0.32	8.22	125.0	13.23	500	650	–	–
IM02	ABR	6/29/2023	15:30	1.5	4.9	12.1	0.34	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	2.0	6.6	11.9	0.36	8.12	122.1	13.24	545	722	3.91	-22
IM02	ABR	6/29/2023	15:30	2.5	8.2	12.0	0.36	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	3.0	9.8	11.9	0.36	8.11	115.7	12.42	557	744	–	–
IM02	ABR	6/29/2023	15:30	3.5	11.5	11.7	0.38	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	4.0	13.1	11.6	0.40	8.11	120.5	13.01	601	808	–	–
IM02	ABR	6/29/2023	15:30	4.5	14.8	11.7	0.39	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	5.0	16.4	11.5	0.41	8.09	128.0	13.93	615	830	4.12	22
IM02	ABR	6/29/2023	15:30	5.5	18.0	11.5	0.41	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	6.0	19.7	11.5	0.41	8.09	123.0	13.39	618	833	–	–
IM02	ABR	6/29/2023	15:30	6.5	21.3	11.5	0.41	–	–	–	–	–	–	–
IM02	ABR	6/29/2023	15:30	7.0	23.0	11.4	0.41	8.09	120.6	13.14	619	835	–	–
IM03	ABR	6/29/2023	17:15	0.0	0.0	15.5	0.34	8.08	166.0	16.90	569	692	–	–
IM03	ABR	6/29/2023	17:15	0.5	1.6	14.8	0.34	–	–	–	–	–	–	–
IM03	ABR	6/29/2023	17:15	1.0	3.3	13.3	0.35	8.16	132.0	13.00	561	722	–	–
IM03	ABR	6/29/2023	17:15	1.5	4.9	12.5	0.37	–	–	–	–	–	–	–
IM03	ABR	6/29/2023	17:15	2.0	6.6	11.9	0.38	8.12	108.7	11.71	575	765	–	–
IM03	ABR	6/29/2023	17:15	2.5	8.2	11.9	0.38	–	–	–	–	–	–	–
IM03	ABR	6/29/2023	17:15	3.0	9.8	11.8	0.38	8.08	106.1	11.45	572	765	–	–
IM03	ABR	6/29/2023	17:15	3.5	11.5	11.8	0.38	–	–	–	–	–	–	–
IM03	ABR	6/29/2023	17:15	4.0	13.1	11.6	0.38	8.03	107.9	11.70	581	780	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM03	ABR	6/29/2023	17:15	4.5	14.8	11.4	0.41	–	–	–	–	–	–	–
IM06	ABR	6/30/2023	9:05	0.0	0.0	13.6	0.27	8.17	95.0	9.86	439.2	562	–	–
IM06	ABR	6/30/2023	9:05	0.5	1.6	13.6	0.27	–	–	–	–	–	–	–
IM06	ABR	6/30/2023	9:05	1.0	3.3	13.6	0.27	8.22	94.7	9.84	438.6	561.6	–	–
IM06	ABR	6/30/2023	9:05	1.5	4.9	13.6	0.27	–	–	–	–	–	–	–
IM06	ABR	6/30/2023	9:05	2.0	6.6	13.5	0.27	8.24	95.0	9.87	435.3	557	–	–
IM06	ABR	6/30/2023	9:05	2.5	8.2	13.6	0.27	–	–	–	–	–	–	–
IM06	ABR	6/30/2023	9:05	3.0	9.8	13.4	0.27	8.25	95.1	9.91	424.6	545.1	–	–
IM06	ABR	6/30/2023	9:05	3.5	11.5	12.7	0.24	–	–	–	–	–	–	–
IM06	ABR	6/30/2023	9:05	4.0	13.1	11.6	0.24	8.28	90.2	9.79	361.3	485.5	–	–
IM09	ABR	6/30/2023	9:40	0.0	0.0	13.3	0.38	7.81	94.9	9.91	600	771	–	–
IM09	ABR	6/30/2023	9:40	0.5	1.6	13.3	0.38	–	–	–	–	–	–	–
IM09	ABR	6/30/2023	9:40	1.0	3.3	13.3	0.38	7.91	93.7	9.79	600	772	–	–
IM09	ABR	6/30/2023	9:40	1.5	4.9	13.3	0.38	–	–	–	–	–	–	–
IM09	ABR	6/30/2023	9:40	2.0	6.6	13.1	0.39	7.92	93.5	9.81	614	795	–	–
IM09	ABR	6/30/2023	9:40	2.5	8.2	13.0	0.40	–	–	–	–	–	–	–
IM09	ABR	6/30/2023	9:40	3.0	9.8	12.3	0.43	7.76	88.4	9.44	652	860	–	–
IM09	ABR	6/30/2023	9:40	3.5	11.5	11.2	0.49	–	–	–	–	–	–	–
IM12	ABR	6/30/2023	10:20	0.0	0.0	14.4	0.13	7.84	96.3	9.83	213	266.9	–	–
IM12	ABR	6/30/2023	10:20	0.5	1.6	14.4	0.13	–	–	–	–	–	–	–
IM12	ABR	6/30/2023	10:20	1.0	3.3	14.4	0.13	8.04	95.7	9.76	213	266.9	–	–
IM12	ABR	6/30/2023	10:20	1.5	4.9	14.4	0.13	–	–	–	–	–	–	–
IM12	ABR	6/30/2023	10:20	2.0	6.6	14.4	0.13	8.06	95.5	9.73	213.8	267.9	–	–
IM12	ABR	6/30/2023	10:20	2.5	8.2	14.4	0.13	–	–	–	–	–	–	–
IM12	ABR	6/30/2023	10:20	3.0	9.8	12.3	0.28	7.95	93.8	10.01	417	545.8	–	–
IM11a	ABR	6/30/2023	10:50	0.0	0.0	14.6	0.15	7.73	95.8	9.73	244.4	305.2	–	–
IM11a	ABR	6/30/2023	10:50	0.5	1.6	14.6	0.15	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM11a	ABR	6/30/2023	10:50	1.0	3.3	14.6	0.15	8.02	96.0	9.75	244.4	305.3	–	–
IM11a	ABR	6/30/2023	10:50	1.5	4.9	14.5	0.15	–	–	–	–	–	–	–
IM11a	ABR	6/30/2023	10:50	2.0	6.6	14.5	0.14	8.03	95.6	9.74	239.5	299.4	–	–
IM11a	ABR	6/30/2023	10:50	2.5	8.2	14.5	0.14	–	–	–	–	–	–	–
IM11a	ABR	6/30/2023	10:50	3.0	9.8	12.8	0.39	7.88	90.7	9.58	610	795	–	–
IM11a	ABR	6/30/2023	10:50	3.5	11.5	12.4	0.38	–	–	–	–	–	–	–
IM10a	ABR	6/30/2023	11:25	0.0	0.0	15.1	0.33	7.85	98.8	9.92	543	669	–	–
IM10a	ABR	6/30/2023	11:25	0.5	1.6	15.1	0.33	–	–	–	–	–	–	–
IM10a	ABR	6/30/2023	11:25	1.0	3.3	15.1	0.33	8.01	96.6	9.69	544	671	–	–
IM10a	ABR	6/30/2023	11:25	1.5	4.9	15.1	0.33	–	–	–	–	–	–	–
IM10a	ABR	6/30/2023	11:25	2.0	6.6	15.0	0.33	8.02	97.7	9.86	549	678	–	–
IM10a	ABR	6/30/2023	11:25	2.5	8.2	14.9	0.34	–	–	–	–	–	–	–
IM10a	ABR	6/30/2023	11:25	3.0	9.8	14.6	0.38	7.95	95.1	9.67	613	765	–	–
IM08a	ABR	6/30/2023	13:00	0.0	0.0	13.8	0.41	7.72	95.0	9.70	652	831	–	–
IM08a	ABR	6/30/2023	13:00	0.5	1.6	13.7	0.41	–	–	–	–	–	–	–
IM08a	ABR	6/30/2023	13:00	1.0	3.3	13.1	0.41	7.83	93.7	9.81	646	836	–	–
IM08a	ABR	6/30/2023	13:00	1.5	4.9	13.1	0.41	–	–	–	–	–	–	–
IM08a	ABR	6/30/2023	13:00	2.0	6.6	13.1	0.41	7.87	93.5	9.83	644	834	–	–
IM08a	ABR	6/30/2023	13:00	2.5	8.2	13.0	0.41	–	–	–	–	–	–	–
IM08a	ABR	6/30/2023	13:00	3.0	9.8	12.9	0.41	7.88	92.8	9.78	632	823	–	–
IM08a	ABR	6/30/2023	13:00	3.5	11.5	12.3	0.40	–	–	–	–	–	–	–
IM07a	ABR	6/30/2023	13:45	0.0	0.0	15.2	0.36	7.79	98.8	9.91	587	723	–	–
IM07a	ABR	6/30/2023	13:45	0.5	1.6	15.1	0.35	–	–	–	–	–	–	–
IM07a	ABR	6/30/2023	13:45	1.0	3.3	15.1	0.35	7.98	98.2	9.82	585	721	3.73	100
IM07a	ABR	6/30/2023	13:45	1.5	4.9	15.1	0.35	–	–	–	–	–	–	–
IM07a	ABR	6/30/2023	13:45	2.0	6.6	15.0	0.35	8.01	97.9	9.85	575	712	–	–
IM07a	ABR	6/30/2023	13:45	2.5	8.2	14.9	0.34	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM07a	ABR	6/30/2023	13:45	3.0	9.8	14.3	0.35	7.90	93.4	9.50	576	726	3.82	91
IM01a	ABR	8/15/2023	9:15	0.0	0.0	16.0	0.81	8.43	99.0	9.74	1,326	1,602	–	–
IM01a	ABR	8/15/2023	9:15	0.5	1.6	16.0	0.81	–	–	–	–	–	–	–
IM01a	ABR	8/15/2023	9:15	1.0	3.3	16.0	0.81	8.45	98.0	9.69	1,325	1,601	–	–
IM01a	ABR	8/15/2023	9:15	1.5	4.9	16.0	0.81	–	–	–	–	–	–	–
IM01a	ABR	8/15/2023	9:15	2.0	6.6	16.0	0.81	8.46	98.6	9.71	1,325	1,599	–	–
IM01a	ABR	8/15/2023	9:15	2.5	8.2	16.0	0.82	–	–	–	–	–	–	–
IM01a	ABR	8/15/2023	9:15	3.0	9.8	15.7	6.99	7.58	72.6	6.85	10,498	12,031	–	–
IM01a	ABR	8/15/2023	9:15	3.5	11.5	15.4	8.59	–	–	–	–	–	–	–
IM01a	ABR	8/15/2023	9:15	4.0	13.1	15.4	8.61	7.49	68.6	6.50	12,030	14,747	–	–
IM02	ABR	8/15/2023	9:40	0.0	0.0	15.7	0.97	8.27	99.2	9.79	1,547	1,885	–	–
IM02	ABR	8/15/2023	9:40	0.5	1.6	15.7	0.97	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	1.0	3.3	15.7	0.97	8.42	98.4	9.71	1,553	1,887	–	–
IM02	ABR	8/15/2023	9:40	1.5	4.9	15.7	0.97	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	2.0	6.6	15.7	1.01	8.43	98.2	9.72	1,586	1,914	7.77	-1
IM02	ABR	8/15/2023	9:40	2.5	8.2	15.7	1.03	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	3.0	9.8	15.7	1.16	8.40	97.5	9.59	1,748	2,090	–	–
IM02	ABR	8/15/2023	9:40	3.5	11.5	15.5	1.38	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	4.0	13.1	15.3	7.63	7.55	62.2	6.08	11,167	13,724	–	–
IM02	ABR	8/15/2023	9:40	4.5	14.8	15.3	9.33	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	5.0	16.4	15.3	9.39	7.55	73.8	6.99	13,003	15,988	5.53	42
IM02	ABR	8/15/2023	9:40	5.5	18.0	15.2	9.40	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	6.0	19.7	15.2	9.42	7.56	73.1	6.93	13,036	16,026	–	–
IM02	ABR	8/15/2023	9:40	6.5	21.3	15.2	9.43	–	–	–	–	–	–	–
IM02	ABR	8/15/2023	9:40	7.0	23.0	15.2	9.41	7.52	71.3	6.75	13,024	16,032	–	–
IM02	ABR	8/15/2023	9:40	7.5	24.6	15.2	9.38	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	0.0	0.0	15.6	1.01	8.40	98.9	9.80	1,628	1,960	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM03	ABR	8/15/2023	11:15	0.5	1.6	15.7	1.01	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	1.0	3.3	15.7	1.01	8.43	97.5	9.68	1,634	1,988	–	–
IM03	ABR	8/15/2023	11:15	1.5	4.9	15.7	1.02	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	2.0	6.6	15.7	1.04	8.43	98.6	9.74	1,624	2,014	–	–
IM03	ABR	8/15/2023	11:15	2.5	8.2	15.7	1.06	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	3.0	9.8	15.7	1.12	8.41	96.2	9.51	1,795	2,184	–	–
IM03	ABR	8/15/2023	11:15	3.5	11.5	15.6	1.22	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	4.0	13.1	15.5	1.46	8.33	96.2	9.50	2,311	2,822	–	–
IM03	ABR	8/15/2023	11:15	4.5	14.8	15.3	8.83	–	–	–	–	–	–	–
IM03	ABR	8/15/2023	11:15	5.0	16.4	15.3	9.02	7.45	64.4	6.10	12,518	15,400	–	–
IM06	ABR	8/15/2023	11:45	0.0	0.0	15.6	1.51	8.24	98.7	9.76	2,355	2,870	–	–
IM06	ABR	8/15/2023	11:45	0.5	1.6	15.6	1.50	–	–	–	–	–	–	–
IM06	ABR	8/15/2023	11:45	1.0	3.3	15.6	1.50	8.33	98.3	9.60	2,354	2,871	–	–
IM06	ABR	8/15/2023	11:45	1.5	4.9	15.6	1.50	–	–	–	–	–	–	–
IM06	ABR	8/15/2023	11:45	2.0	6.6	15.6	1.52	8.33	97.9	9.60	2,403	2,936	–	–
IM06	ABR	8/15/2023	11:45	2.5	8.2	15.6	1.63	–	–	–	–	–	–	–
IM06	ABR	8/15/2023	11:45	3.0	9.8	15.6	1.85	8.27	96.1	9.51	2,868	3,501	–	–
IM06	ABR	8/15/2023	11:45	3.5	11.5	15.6	1.86	–	–	–	–	–	–	–
IM06	ABR	8/15/2023	11:45	4.0	13.1	15.5	1.86	8.27	95.6	9.44	2,873	3,512	–	–
IM09	ABR	8/15/2023	12:10	0.0	0.0	15.6	1.34	8.24	98.3	9.74	1,325	2,763	–	–
IM09	ABR	8/15/2023	12:10	0.5	1.6	15.6	1.45	–	–	–	–	–	–	–
IM09	ABR	8/15/2023	12:10	1.0	3.3	15.6	1.45	8.29	98.8	9.77	2,273	2,774	–	–
IM09	ABR	8/15/2023	12:10	1.5	4.9	15.6	1.44	–	–	–	–	–	–	–
IM09	ABR	8/15/2023	12:10	2.0	6.6	15.6	1.45	8.30	98.5	9.72	2,273	2,776	–	–
IM09	ABR	8/15/2023	12:10	2.5	8.2	15.6	1.52	–	–	–	–	–	–	–
IM09	ABR	8/15/2023	12:10	3.0	9.8	15.5	1.67	8.20	93.4	9.23	2,604	3,188	–	–
IM09	ABR	8/15/2023	12:10	3.5	11.5	15.5	1.69	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM05a	ABR	8/15/2023	13:00	0.0	0.0	15.8	0.60	8.14	94.0	9.34	983	1,195	–	–
IM05a	ABR	8/15/2023	13:00	0.5	1.6	15.8	0.60	–	–	–	–	–	–	–
IM05a	ABR	8/15/2023	13:00	1.0	3.3	15.7	0.60	8.21	92.9	9.20	984	1,195	–	–
IM05a	ABR	8/15/2023	13:00	1.5	4.9	15.7	0.60	–	–	–	–	–	–	–
IM05a	ABR	8/15/2023	13:00	2.0	6.6	15.7	0.60	8.22	93.5	9.28	983	1,195	–	–
IM05a	ABR	8/15/2023	13:00	2.5	8.2	15.7	0.60	–	–	–	–	–	–	–
IM05a	ABR	8/15/2023	13:00	3.0	9.8	15.7	0.60	8.21	91.7	9.08	982	1,194	–	–
IM05a	ABR	8/15/2023	13:00	3.5	11.5	15.7	0.60	–	–	–	–	–	–	–
IM05a	ABR	8/15/2023	13:00	4.0	13.1	15.7	0.60	8.20	91.1	9.04	979	1,192	–	–
IM04a	ABR	8/15/2023	13:20	0.0	0.0	16.4	0.65	8.61	107.9	10.52	1,079	1,293	–	–
IM04a	ABR	8/15/2023	13:20	0.5	1.6	16.3	0.65	–	–	–	–	–	–	–
IM04a	ABR	8/15/2023	13:20	1.0	3.3	16.3	0.65	8.66	108.1	10.56	1,070	1,286	–	–
IM04a	ABR	8/15/2023	13:20	1.5	4.9	16.2	0.64	–	–	–	–	–	–	–
IM04a	ABR	8/15/2023	13:20	2.0	6.6	16.1	0.64	8.66	106.3	10.47	1,063	1,283	–	–
IM04a	ABR	8/15/2023	13:20	2.5	8.2	16.0	0.64	–	–	–	–	–	–	–
IM04a	ABR	8/15/2023	13:20	3.0	9.8	16.0	0.65	8.65	104.9	10.36	1,064	1,284	–	–
IM08a	ABR	8/15/2023	15:35	0.0	0.0	16.5	0.82	8.39	106.5	10.32	1,356	1,621	–	–
IM08a	ABR	8/15/2023	15:35	0.5	1.6	16.5	0.82	–	–	–	–	–	–	–
IM08a	ABR	8/15/2023	15:35	1.0	3.3	16.5	0.82	8.52	105.7	10.33	1,346	1,610	–	–
IM08a	ABR	8/15/2023	15:35	1.5	4.9	16.5	0.82	–	–	–	–	–	–	–
IM08a	ABR	8/15/2023	15:35	2.0	6.6	16.4	0.80	8.51	105.4	10.27	1,336	1,589	–	–
IM08a	ABR	8/15/2023	15:35	2.5	8.2	16.3	0.81	–	–	–	–	–	–	–
IM08a	ABR	8/15/2023	15:35	3.0	9.8	15.9	0.88	8.37	97.0	9.57	1,421	1,721	–	–
IM08a	ABR	8/15/2023	15:35	3.5	11.5	15.9	0.88	–	–	–	–	–	–	–
IM08a	ABR	8/15/2023	15:35	4.0	13.1	15.9	0.88	8.37	96.8	9.45	1,417	1,716	–	–
IM10a	ABR	8/15/2023	16:05	0.0	0.0	16.5	0.38	8.19	101.2	9.86	641	766	–	–
IM10a	ABR	8/15/2023	16:05	0.5	1.6	16.5	0.38	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM10a	ABR	8/15/2023	16:05	1.0	3.3	16.4	0.38	8.26	101.0	9.86	644	769	–	–
IM10a	ABR	8/15/2023	16:05	1.5	4.9	16.0	0.41	–	–	–	–	–	–	–
IM10a	ABR	8/15/2023	16:05	2.0	6.6	16.0	0.43	8.14	94.7	9.25	727	882	–	–
IM10a	ABR	8/15/2023	16:05	2.5	8.2	15.8	0.48	–	–	–	–	–	–	–
IM10a	ABR	8/15/2023	16:05	3.0	9.8	16.1	0.58	8.34	97.7	9.56	966	1,163	–	–
IM10a	ABR	8/15/2023	16:05	3.5	11.5	16.1	0.58	–	–	–	–	–	–	–
IM12	ABR	8/16/2023	14:05	0.0	0.0	15.6	0.82	8.35	98.4	9.76	1,330	1,617	–	–
IM12	ABR	8/16/2023	14:05	0.5	1.6	15.6	0.83	–	–	–	–	–	–	–
IM12	ABR	8/16/2023	14:05	1.0	3.3	15.6	0.90	8.36	98.1	9.74	1,415	1,714	–	–
IM12	ABR	8/16/2023	14:05	1.5	4.9	15.5	0.93	–	–	–	–	–	–	–
IM12	ABR	8/16/2023	14:05	2.0	6.6	15.5	0.98	8.36	97.8	9.71	1,583	1,933	–	–
IM12	ABR	8/16/2023	14:05	2.5	8.2	15.6	1.03	–	–	–	–	–	–	–
IM12	ABR	8/16/2023	14:05	3.0	9.8	15.6	1.04	8.37	98.5	9.71	1,667	2,034	–	–
IM12	ABR	8/16/2023	14:05	3.5	11.5	15.6	1.04	–	–	–	–	–	–	–
IM11a	ABR	8/16/2023	14:20	0.0	0.0	15.7	0.34	8.20	98.1	9.73	654	794	–	–
IM11a	ABR	8/16/2023	14:20	0.5	1.6	15.7	0.39	–	–	–	–	–	–	–
IM11a	ABR	8/16/2023	14:20	1.0	3.3	15.7	0.39	8.23	97.3	9.65	654	798	–	–
IM11a	ABR	8/16/2023	14:20	1.5	4.9	15.7	0.39	–	–	–	–	–	–	–
IM11a	ABR	8/16/2023	14:20	2.0	6.6	15.6	0.40	8.23	96.6	9.65	655	799	–	–
IM11a	ABR	8/16/2023	14:20	2.5	8.2	15.5	0.40	–	–	–	–	–	–	–
IM11a	ABR	8/16/2023	14:20	3.0	9.8	15.5	0.40	8.22	95.8	9.57	658	808	–	–
IM11a	ABR	8/16/2023	14:20	3.5	11.5	15.5	0.40	–	–	–	–	–	–	–
IM07a	ABR	8/16/2023	15:15	0.0	0.0	15.9	0.45	8.18	98.5	9.72	752	910	–	–
IM07a	ABR	8/16/2023	15:15	0.5	1.6	15.8	0.45	–	–	–	–	–	–	–
IM07a	ABR	8/16/2023	15:15	1.0	3.3	15.8	0.45	8.19	98.0	9.69	755	916	12.3	42
IM07a	ABR	8/16/2023	15:15	1.5	4.9	15.7	0.46	–	–	–	–	–	–	–
IM07a	ABR	8/16/2023	15:15	2.0	6.6	15.7	0.46	8.20	97.4	9.68	757	920	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM07a	ABR	8/16/2023	15:15	2.5	8.2	15.7	0.46	–	–	–	–	–	–	–
IM07a	ABR	8/16/2023	15:15	3.0	9.8	15.7	0.46	8.20	97.4	9.62	759	922	31.8	39
IM05a	ABR	9/26/2023	10:25	0.0	0.0	5.8	0.24	7.85	100.0	12.47	319.1	503.5	–	–
IM05a	ABR	9/26/2023	10:25	0.5	1.6	5.8	0.24	–	–	–	–	–	–	–
IM05a	ABR	9/26/2023	10:25	1.0	3.3	5.8	0.24	7.90	99.2	12.39	319	503.4	–	–
IM05a	ABR	9/26/2023	10:25	1.5	4.9	5.8	0.24	–	–	–	–	–	–	–
IM05a	ABR	9/26/2023	10:25	2.0	6.6	5.8	0.24	7.93	99.2	12.38	318.6	503.1	–	–
IM05a	ABR	9/26/2023	10:25	2.5	8.2	5.8	0.24	–	–	–	–	–	–	–
IM05a	ABR	9/26/2023	10:25	3.0	9.8	5.8	0.24	7.94	99.1	12.34	318.6	503.3	–	–
IM05a	ABR	9/26/2023	10:25	3.5	11.5	5.8	0.24	–	–	–	–	–	–	–
IM05a	ABR	9/26/2023	10:25	4.0	13.1	5.9	0.60	7.64	89.0	10.60	607	897	–	–
IM01a	ABR	9/26/2023	10:55	0.0	0.0	6.4	0.49	7.79	101.1	12.41	645	999	–	–
IM01a	ABR	9/26/2023	10:55	0.5	1.6	6.4	0.49	–	–	–	–	–	–	–
IM01a	ABR	9/26/2023	10:55	1.0	3.3	6.4	0.49	7.91	99.8	12.24	645	1,000	–	–
IM01a	ABR	9/26/2023	10:55	1.5	4.9	6.4	0.49	–	–	–	–	–	–	–
IM01a	ABR	9/26/2023	10:55	2.0	6.6	6.4	0.49	7.96	99.2	12.16	645	999	–	–
IM01a	ABR	9/26/2023	10:55	2.5	8.2	6.4	0.49	–	–	–	–	–	–	–
IM01a	ABR	9/26/2023	10:55	3.0	9.8	6.4	0.49	7.99	99.0	12.12	645	1,000	–	–
IM01a	ABR	9/26/2023	10:55	3.5	11.5	6.4	0.49	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	0.0	0.0	5.8	0.26	7.82	104.0	12.54	348	549.4	–	–
IM02	ABR	9/26/2023	11:15	0.5	1.6	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	1.0	3.3	5.8	0.27	7.90	100.0	12.46	348	549.7	–	–
IM02	ABR	9/26/2023	11:15	1.5	4.9	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	2.0	6.6	5.8	0.27	8.00	100.2	12.52	348	549.9	6.27	199
IM02	ABR	9/26/2023	11:15	2.5	8.2	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	3.0	9.8	5.8	0.27	8.04	100.3	12.51	348.4	550	–	–
IM02	ABR	9/26/2023	11:15	3.5	11.5	5.8	0.27	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM02	ABR	9/26/2023	11:15	4.0	13.1	5.8	0.27	8.06	99.5	12.43	348.8	550.7	–	–
IM02	ABR	9/26/2023	11:15	4.5	14.8	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	5.0	16.4	5.8	0.27	8.08	99.6	12.44	348.8	550.8	6.1	193
IM02	ABR	9/26/2023	11:15	5.5	18.0	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	6.0	19.7	5.8	0.27	8.09	99.8	12.46	349.2	551.2	–	–
IM02	ABR	9/26/2023	11:15	6.5	21.3	5.8	0.27	–	–	–	–	–	–	–
IM02	ABR	9/26/2023	11:15	7.0	23.0	5.9	0.27	8.12	99.7	12.44	352.4	557.2	–	–
IM03	ABR	9/26/2023	12:40	0.0	0.0	6.2	0.39	7.95	98.4	12.50	512	800	–	–
IM03	ABR	9/26/2023	12:40	0.5	1.6	6.2	0.39	–	–	–	–	–	–	–
IM03	ABR	9/26/2023	12:40	1.0	3.3	6.2	0.39	7.98	99.2	12.24	513	800	–	–
IM03	ABR	9/26/2023	12:40	1.5	4.9	6.2	0.39	–	–	–	–	–	–	–
IM03	ABR	9/26/2023	12:40	2.0	6.6	6.2	0.39	8.00	98.7	12.18	515	804	–	–
IM03	ABR	9/26/2023	12:40	2.5	8.2	6.2	0.40	–	–	–	–	–	–	–
IM03	ABR	9/26/2023	12:40	3.0	9.8	6.2	0.40	8.00	98.6	12.17	516	806	–	–
IM03	ABR	9/26/2023	12:40	3.5	11.5	6.1	0.40	–	–	–	–	–	–	–
IM03	ABR	9/26/2023	12:40	4.0	13.1	6.2	0.40	8.01	97.6	12.05	523	817	–	–
IM03	ABR	9/26/2023	12:40	4.5	14.8	6.2	0.50	–	–	–	–	–	–	–
IM06	ABR	9/26/2023	13:00	0.0	0.0	5.8	0.12	7.66	100.0	12.44	165.5	261.5	–	–
IM06	ABR	9/26/2023	13:00	0.5	1.6	5.8	0.12	–	–	–	–	–	–	–
IM06	ABR	9/26/2023	13:00	1.0	3.3	5.8	0.12	7.83	100.9	12.64	165.4	261.6	–	–
IM06	ABR	9/26/2023	13:00	1.5	4.9	5.7	0.12	–	–	–	–	–	–	–
IM06	ABR	9/26/2023	13:00	2.0	6.6	5.7	0.12	7.88	99.6	12.49	165.3	261.7	–	–
IM06	ABR	9/26/2023	13:00	2.5	8.2	5.7	0.12	–	–	–	–	–	–	–
IM06	ABR	9/26/2023	13:00	3.0	9.8	5.7	0.13	7.89	100.2	12.62	165.5	262	–	–
IM06	ABR	9/26/2023	13:00	3.5	11.5	5.6	0.13	–	–	–	–	–	–	–
IM06	ABR	9/26/2023	13:00	4.0	13.1	5.6	0.13	7.90	98.9	12.40	167.2	265.9	–	–
IM09	ABR	9/26/2023	13:15	0.0	0.0	5.7	0.14	7.63	100.4	12.60	179.9	285.2	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM09	ABR	9/26/2023	13:15	0.5	1.6	5.6	0.14	–	–	–	–	–	–	–
IM09	ABR	9/26/2023	13:15	1.0	3.3	5.6	0.14	7.73	99.3	12.50	188.3	299.4	–	–
IM09	ABR	9/26/2023	13:15	1.5	4.9	5.6	0.16	–	–	–	–	–	–	–
IM09	ABR	9/26/2023	13:15	2.0	6.6	5.6	0.18	7.81	97.0	12.22	234.7	373.1	–	–
IM09	ABR	9/26/2023	13:15	2.5	8.2	5.6	0.19	–	–	–	–	–	–	–
IM09	ABR	9/26/2023	13:15	3.0	9.8	5.6	0.20	7.87	96.6	12.12	258.2	409.7	–	–
IM09	ABR	9/26/2023	13:15	3.5	11.5	5.7	0.22	–	–	–	–	–	–	–
IM08a	ABR	9/26/2023	13:35	0.0	0.0	6.4	0.32	7.82	97.6	11.99	418.1	649.5	–	–
IM08a	ABR	9/26/2023	13:35	0.5	1.6	6.3	0.32	–	–	–	–	–	–	–
IM08a	ABR	9/26/2023	13:35	1.0	3.3	6.3	0.32	7.92	95.8	11.82	417.3	649.2	–	–
IM08a	ABR	9/26/2023	13:35	1.5	4.9	6.3	0.32	–	–	–	–	–	–	–
IM08a	ABR	9/26/2023	13:35	2.0	6.6	6.2	0.31	7.94	96.0	11.83	414.3	646.4	–	–
IM08a	ABR	9/26/2023	13:35	2.5	8.2	6.2	0.32	–	–	–	–	–	–	–
IM08a	ABR	9/26/2023	13:35	3.0	9.8	6.2	0.32	7.97	95.5	11.82	421.4	657.4	–	–
IM08a	ABR	9/26/2023	13:35	3.5	11.5	6.2	0.32	–	–	–	–	–	–	–
IM12	ABR	9/26/2023	14:15	0.0	0.0	5.7	0.19	7.57	99.4	12.44	251.2	398	–	–
IM12	ABR	9/26/2023	14:15	0.5	1.6	5.5	0.20	–	–	–	–	–	–	–
IM12	ABR	9/26/2023	14:15	1.0	3.3	5.8	0.29	7.83	98.5	12.26	381.1	604	–	–
IM12	ABR	9/26/2023	14:15	1.5	4.9	6.1	0.42	–	–	–	–	–	–	–
IM12	ABR	9/26/2023	14:15	2.0	6.6	6.2	0.45	7.94	97.2	12.00	591	921	–	–
IM12	ABR	9/26/2023	14:15	2.5	8.2	6.2	0.46	–	–	–	–	–	–	–
IM12	ABR	9/26/2023	14:15	3.0	9.8	6.2	0.46	7.97	97.9	12.06	599	933	–	–
IM11a	ABR	9/26/2023	14:30	0.0	0.0	6.8	0.37	7.82	98.1	11.97	485.7	745.3	–	–
IM11a	ABR	9/26/2023	14:30	0.5	1.6	6.5	0.36	–	–	–	–	–	–	–
IM11a	ABR	9/26/2023	14:30	1.0	3.3	6.3	0.36	7.93	98.1	12.06	477.8	743	–	–
IM11a	ABR	9/26/2023	14:30	1.5	4.9	6.3	0.36	–	–	–	–	–	–	–
IM11a	ABR	9/26/2023	14:30	2.0	6.6	6.3	0.37	7.93	97.0	11.92	485.3	756.3	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM11a	ABR	9/26/2023	14:30	2.5	8.2	6.3	0.37	–	–	–	–	–	–	–
IM11a	ABR	9/26/2023	14:30	3.0	9.8	6.3	0.38	7.95	96.3	11.95	494	768.3	–	–
IM11a	ABR	9/26/2023	14:30	3.5	11.5	6.3	0.38	–	–	–	–	–	–	–
IM10a	ABR	9/26/2023	14:50	0.0	0.0	6.6	0.34	7.92	101.2	12.34	452.4	696.7	–	–
IM10a	ABR	9/26/2023	14:50	0.5	1.6	6.3	0.34	–	–	–	–	–	–	–
IM10a	ABR	9/26/2023	14:50	1.0	3.3	6.4	0.34	8.03	98.2	12.07	449.8	697.9	–	–
IM10a	ABR	9/26/2023	14:50	1.5	4.9	6.2	0.34	–	–	–	–	–	–	–
IM10a	ABR	9/26/2023	14:50	2.0	6.6	6.2	0.35	8.03	97.9	12.08	454.9	709.3	–	–
IM10a	ABR	9/26/2023	14:50	2.5	8.2	6.2	0.35	–	–	–	–	–	–	–
IM10a	ABR	9/26/2023	14:50	3.0	9.8	6.2	0.35	8.04	98.1	12.11	457.1	712.5	–	–
IM07a	ABR	9/26/2023	15:15	0.0	0.0	6.7	0.46	7.83	99.1	12.08	604	929	–	–
IM07a	ABR	9/26/2023	15:15	0.5	1.6	6.6	0.46	–	–	–	–	–	–	–
IM07a	ABR	9/26/2023	15:15	1.0	3.3	6.6	0.46	7.92	99.1	12.15	608	938	3.23	211
IM07a	ABR	9/26/2023	15:15	1.5	4.9	6.5	0.48	–	–	–	–	–	–	–
IM07a	ABR	9/26/2023	15:15	2.0	6.6	6.4	0.49	7.97	97.9	12.03	639	990	–	–
IM07a	ABR	9/26/2023	15:15	2.5	8.2	6.4	0.50	–	–	–	–	–	–	–
IM07a	ABR	9/26/2023	15:15	3.0	9.8	6.4	0.50	7.98	94.8	11.63	654	1,014	3.24	201
IM04a	ABR	9/26/2023	16:40	0.0	0.0	6.4	0.28	7.92	99.9	12.30	364.5	562	–	–
IM04a	ABR	9/26/2023	16:40	0.5	1.6	6.6	0.27	–	–	–	–	–	–	–
IM04a	ABR	9/26/2023	16:40	1.0	3.3	6.6	0.27	8.11	99.1	12.20	363.1	560.7	–	–
IM04a	ABR	9/26/2023	16:40	1.5	4.9	6.3	0.27	–	–	–	–	–	–	–
IM04a	ABR	9/26/2023	16:40	2.0	6.6	6.3	0.29	8.10	98.3	12.10	382.9	596.6	–	–
IM04a	ABR	9/26/2023	16:40	2.5	8.2	6.4	0.49	–	–	–	–	–	–	–
IM08a	ABR	6/27/2024	9:40	0.0	0.0	14.7	0.35	7.71	91.3	9.29	566	705	–	–
IM08a	ABR	6/27/2024	9:40	0.5	1.6	14.7	0.35	–	–	–	–	–	–	–
IM08a	ABR	6/27/2024	9:40	1.0	3.3	14.7	0.35	7.86	99.0	10.07	565	704	–	–
IM08a	ABR	6/27/2024	9:40	1.5	4.9	14.6	0.35	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM08a	ABR	6/27/2024	9:40	2.0	6.6	14.6	0.35	7.89	102.2	10.38	565	705	–	–
IM08a	ABR	6/27/2024	9:40	2.5	8.2	14.6	0.35	–	–	–	–	–	–	–
IM08a	ABR	6/27/2024	9:40	3.0	9.8	14.5	0.35	7.90	101.3	10.30	570	713	–	–
IM08a	ABR	6/27/2024	9:40	3.5	11.5	14.5	0.35	–	–	–	–	–	–	–
IM08a	ABR	6/27/2024	9:40	4.0	13.1	14.2	0.36	7.88	100.7	10.34	575	726	–	–
IM10a	ABR	6/27/2024	10:20	0.0	0.0	14.1	0.33	7.64	103.1	10.53	538	678	–	–
IM10a	ABR	6/27/2024	10:20	0.5	1.6	14.2	0.33	–	–	–	–	–	–	–
IM10a	ABR	6/27/2024	10:20	1.0	3.3	14.0	0.33	7.75	101.6	10.44	536	679	–	–
IM10a	ABR	6/27/2024	10:20	1.5	4.9	13.9	0.33	–	–	–	–	–	–	–
IM10a	ABR	6/27/2024	10:20	2.0	6.6	13.8	0.33	7.78	100.5	10.44	534	680	–	–
IM10a	ABR	6/27/2024	10:20	2.5	8.2	13.7	0.34	–	–	–	–	–	–	–
IM10a	ABR	6/27/2024	10:20	3.0	9.8	13.7	0.34	7.79	102.4	10.60	538	686	–	–
IM10a	ABR	6/27/2024	10:20	3.5	11.5	13.5	0.35	–	–	–	–	–	–	–
IM11a	ABR	6/27/2024	10:50	0.0	0.0	15.1	0.31	7.80	103.5	10.39	512	630	–	–
IM11a	ABR	6/27/2024	10:50	0.5	1.6	15.1	0.31	–	–	–	–	–	–	–
IM11a	ABR	6/27/2024	10:50	1.0	3.3	15.0	0.31	7.91	102.8	10.30	519	642	–	–
IM11a	ABR	6/27/2024	10:50	1.5	4.9	14.9	0.32	–	–	–	–	–	–	–
IM11a	ABR	6/27/2024	10:50	2.0	6.6	14.6	0.33	7.90	100.9	10.22	539	672	–	–
IM11a	ABR	6/27/2024	10:50	2.5	8.2	14.4	0.34	–	–	–	–	–	–	–
IM11a	ABR	6/27/2024	10:50	3.0	9.8	13.7	0.34	7.85	103.1	10.63	548	699	–	–
IM11a	ABR	6/27/2024	10:50	3.5	11.5	13.3	0.36	–	–	–	–	–	–	–
IM12	ABR	6/27/2024	11:25	0.0	0.0	15.3	0.30	7.72	101.0	10.07	502	617	–	–
IM12	ABR	6/27/2024	11:25	0.5	1.6	15.2	0.30	–	–	–	–	–	–	–
IM12	ABR	6/27/2024	11:25	1.0	3.3	15.1	0.30	7.86	97.8	9.88	492.7	608.4	–	–
IM12	ABR	6/27/2024	11:25	1.5	4.9	15.0	0.29	–	–	–	–	–	–	–
IM12	ABR	6/27/2024	11:25	2.0	6.6	14.9	0.32	7.86	98.2	9.91	530	658	–	–
IM12	ABR	6/27/2024	11:25	2.5	8.2	14.8	0.35	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM12	ABR	6/27/2024	11:25	3.0	9.8	14.8	0.35	7.86	99.7	10.03	576	715	–	–
IM12	ABR	6/27/2024	11:25	3.5	11.5	13.9	0.35	–	–	–	–	–	–	–
IM09	ABR	6/27/2024	12:50	0.0	0.0	16.0	0.18	7.94	99.2	9.61	322.3	384.2	–	–
IM09	ABR	6/27/2024	12:50	0.5	1.6	16.8	0.18	–	–	–	–	–	–	–
IM09	ABR	6/27/2024	12:50	1.0	3.3	16.4	0.19	8.05	99.6	9.61	326.2	386.3	–	–
IM09	ABR	6/27/2024	12:50	1.5	4.9	16.3	0.24	–	–	–	–	–	–	–
IM09	ABR	6/27/2024	12:50	2.0	6.6	16.3	0.25	8.04	100.4	9.90	426.7	511.8	–	–
IM09	ABR	6/27/2024	12:50	2.5	8.2	16.2	0.27	–	–	–	–	–	–	–
IM09	ABR	6/27/2024	12:50	3.0	9.8	16.1	0.34	7.97	98.8	9.64	582	701	–	–
IM09	ABR	6/27/2024	12:50	3.5	11.5	16.2	0.37	–	–	–	–	–	–	–
IM05a	ABR	6/27/2024	13:30	0.0	0.0	14.1	0.37	7.57	101.1	10.29	597	754	–	–
IM05a	ABR	6/27/2024	13:30	0.5	1.6	14.0	0.37	–	–	–	–	–	–	–
IM05a	ABR	6/27/2024	13:30	1.0	3.3	13.7	0.37	7.84	98.9	10.15	589	750	–	–
IM05a	ABR	6/27/2024	13:30	1.5	4.9	13.5	0.37	–	–	–	–	–	–	–
IM05a	ABR	6/27/2024	13:30	2.0	6.6	13.4	0.37	7.87	96.4	10.13	583	748	–	–
IM05a	ABR	6/27/2024	13:30	2.5	8.2	13.2	0.37	–	–	–	–	–	–	–
IM05a	ABR	6/27/2024	13:30	3.0	9.8	13.0	0.37	7.85	100.0	10.48	578	749	–	–
IM05a	ABR	6/27/2024	13:30	3.5	11.5	13.0	0.38	–	–	–	–	–	–	–
IM05a	ABR	6/27/2024	13:30	4.0	13.1	12.8	0.38	7.83	98.4	10.38	594	773	–	–
IM05a	ABR	6/27/2024	13:30	4.5	14.8	11.6	0.44	–	–	–	–	–	–	–
IM06	ABR	6/27/2024	14:00	0.0	0.0	16.3	0.20	7.90	103.0	10.07	348.8	418.1	–	–
IM06	ABR	6/27/2024	14:00	0.5	1.6	16.3	0.20	–	–	–	–	–	–	–
IM06	ABR	6/27/2024	14:00	1.0	3.3	16.2	0.20	8.00	100.4	9.85	352.3	422.7	–	–
IM06	ABR	6/27/2024	14:00	1.5	4.9	16.1	0.21	–	–	–	–	–	–	–
IM06	ABR	6/27/2024	14:00	2.0	6.6	16.0	0.24	8.04	99.7	9.87	402.6	486.5	–	–
IM06	ABR	6/27/2024	14:00	2.5	8.2	15.6	0.33	–	–	–	–	–	–	–
IM06	ABR	6/27/2024	14:00	3.0	9.8	15.3	0.37	8.07	105.5	10.54	614	755	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM06	ABR	6/27/2024	14:00	3.5	11.5	14.9	0.43	–	–	–	–	–	–	–
IM06	ABR	6/27/2024	14:00	4.0	13.1	12.4	0.67	7.77	84.7	9.02	1,007	1,324	–	–
IM03	ABR	6/27/2024	14:40	0.0	0.0	14.9	0.49	7.90	105.1	10.62	801	993	–	–
IM03	ABR	6/27/2024	14:40	0.5	1.6	14.7	0.49	–	–	–	–	–	–	–
IM03	ABR	6/27/2024	14:40	1.0	3.3	14.4	0.54	8.03	101.0	10.28	818	1,024	–	–
IM03	ABR	6/27/2024	14:40	1.5	4.9	14.2	0.52	–	–	–	–	–	–	–
IM03	ABR	6/27/2024	14:40	2.0	6.6	13.9	0.51	8.03	104.3	10.72	812	1,031	–	–
IM03	ABR	6/27/2024	14:40	2.5	8.2	13.6	0.54	–	–	–	–	–	–	–
IM03	ABR	6/27/2024	14:40	3.0	9.8	13.3	0.77	7.90	101.9	10.57	1,183	1,523	–	–
IM03	ABR	6/27/2024	14:40	3.5	11.5	13.2	0.84	–	–	–	–	–	–	–
IM03	ABR	6/27/2024	14:40	4.0	13.1	11.0	7.94	7.49	90.8	9.50	9,776	13,188	–	–
IM03	ABR	6/27/2024	14:40	4.5	14.8	10.5	8.62	–	–	–	–	–	–	–
IM03	ABR	6/27/2024	14:40	5.0	16.4	10.4	8.76	7.49	84.4	8.94	10,830	15,023	–	–
IM02	ABR	6/27/2024	15:30	0.0	0.0	16.1	0.46	8.02	104.7	10.30	777	935	–	–
IM02	ABR	6/27/2024	15:30	0.5	1.6	14.8	0.50	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	1.0	3.3	14.5	0.50	8.10	102.7	10.43	802	1,006	–	–
IM02	ABR	6/27/2024	15:30	1.5	4.9	14.3	0.49	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	2.0	6.6	13.7	0.44	8.01	104.6	10.84	693	882	3.8	174
IM02	ABR	6/27/2024	15:30	2.5	8.2	13.4	0.47	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	3.0	9.8	13.6	0.52	7.98	106.4	10.98	816	1,047	–	–
IM02	ABR	6/27/2024	15:30	3.5	11.5	13.7	0.58	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	4.0	13.1	11.5	4.58	7.54	98.0	10.37	6,092	8,256	–	–
IM02	ABR	6/27/2024	15:30	4.5	14.8	11.0	7.50	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	5.0	16.4	10.8	7.81	7.55	93.4	9.85	9,860	13,512	3.31	187
IM02	ABR	6/27/2024	15:30	5.5	18.0	10.7	8.39	–	–	–	–	–	–	–
IM02	ABR	6/27/2024	15:30	6.0	19.7	10.5	9.30	7.60	92.9	9.79	11,448	15,926	–	–
IM02	ABR	6/27/2024	15:30	6.5	21.3	10.4	9.48	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM02	ABR	6/27/2024	15:30	7.0	23.0	10.4	9.57	7.57	86.0	9.06	11,754	16,328	–	–
IM02	ABR	6/27/2024	15:30	7.5	24.6	10.3	9.71	–	–	–	–	–	–	–
IM01a	ABR	6/27/2024	17:50	0.0	0.0	14.3	0.38	7.65	96.4	9.83	616	773	–	–
IM01a	ABR	6/27/2024	17:50	0.5	1.6	14.3	0.38	–	–	–	–	–	–	–
IM01a	ABR	6/27/2024	17:50	1.0	3.3	14.3	0.38	7.84	101.3	10.36	616	774	–	–
IM01a	ABR	6/27/2024	17:50	1.5	4.9	14.2	0.38	–	–	–	–	–	–	–
IM01a	ABR	6/27/2024	17:50	2.0	6.6	14.1	0.38	7.88	103.0	10.63	612	774	–	–
IM01a	ABR	6/27/2024	17:50	2.5	8.2	13.1	0.38	–	–	–	–	–	–	–
IM01a	ABR	6/27/2024	17:50	3.0	9.8	11.9	1.97	7.47	94.4	10.10	2,739	3,517	–	–
IM01a	ABR	6/27/2024	17:50	3.5	11.5	11.4	5.61	–	–	–	–	–	–	–
IM01a	ABR	6/27/2024	17:50	4.0	13.1	11.0	6.50	7.42	88.1	9.32	8,334	11,382	–	–
IM07a	ABR	6/28/2024	9:50	0.0	0.0	14.4	0.35	7.67	99.0	10.07	568	713	–	–
IM07a	ABR	6/28/2024	9:50	0.5	1.6	14.4	0.35	–	–	–	–	–	–	–
IM07a	ABR	6/28/2024	9:50	1.0	3.3	14.3	0.36	7.71	96.1	9.82	579	728	3.44	210
IM07a	ABR	6/28/2024	9:50	1.5	4.9	14.2	0.36	–	–	–	–	–	–	–
IM07a	ABR	6/28/2024	9:50	2.0	6.6	14.2	0.37	7.73	98.1	10.03	591	745	–	–
IM07a	ABR	6/28/2024	9:50	2.5	8.2	14.2	0.37	–	–	–	–	–	–	–
IM07a	ABR	6/28/2024	9:50	3.0	9.8	13.5	0.39	7.61	95.3	9.93	618	792	4.39	232
IM04a	ABR	6/28/2024	11:30	0.0	0.0	14.9	0.30	7.90	97.7	9.87	491.3	609.8	–	–
IM04a	ABR	6/28/2024	11:30	0.5	1.6	14.9	0.30	–	–	–	–	–	–	–
IM04a	ABR	6/28/2024	11:30	1.0	3.3	14.9	0.30	7.97	104.5	10.52	494.3	613.1	–	–
IM04a	ABR	6/28/2024	11:30	1.5	4.9	14.9	0.30	–	–	–	–	–	–	–
IM04a	ABR	6/28/2024	11:30	2.0	6.6	14.8	0.31	7.96	105.3	10.68	505	627	–	–
IM04a	ABR	6/28/2024	11:30	2.5	8.2	13.5	0.36	–	–	–	–	–	–	–
IM04a	ABR	6/28/2024	11:30	3.0	9.8	13.3	0.37	7.66	97.1	10.13	583	750	–	–
IM05a	ABR	7/30/2024	14:00	0.0	0.0	14.2	0.42	8.00	89.4	9.16	682	859	–	–
IM05a	ABR	7/30/2024	14:00	0.5	1.6	14.1	0.43	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM05a	ABR	7/30/2024	14:00	1.0	3.3	13.5	0.46	8.19	91.7	9.54	720	922	–	–
IM05a	ABR	7/30/2024	14:00	1.5	4.9	13.3	0.54	–	–	–	–	–	–	–
IM05a	ABR	7/30/2024	14:00	2.0	6.6	13.4	0.61	8.29	89.4	9.26	942	1,210	–	–
IM05a	ABR	7/30/2024	14:00	2.5	8.2	13.3	0.63	–	–	–	–	–	–	–
IM05a	ABR	7/30/2024	14:00	3.0	9.8	13.2	0.63	8.22	87.6	9.12	976	1,259	–	–
IM05a	ABR	7/30/2024	14:00	3.5	11.5	13.2	0.63	–	–	–	–	–	–	–
IM03	ABR	7/30/2024	14:35	0.0	0.0	14.2	0.50	8.08	84.8	8.70	804	1,013	–	–
IM03	ABR	7/30/2024	14:35	0.5	1.6	13.7	0.50	–	–	–	–	–	–	–
IM03	ABR	7/30/2024	14:35	1.0	3.3	13.5	0.50	8.24	91.5	9.54	785	1,006	–	–
IM03	ABR	7/30/2024	14:35	1.5	4.9	13.5	0.48	–	–	–	–	–	–	–
IM03	ABR	7/30/2024	14:35	2.0	6.6	12.7	0.44	8.27	93.6	9.92	679	887	–	–
IM03	ABR	7/30/2024	14:35	2.5	8.2	12.6	0.45	–	–	–	–	–	–	–
IM03	ABR	7/30/2024	14:35	3.0	9.8	12.6	0.48	8.26	96.1	10.17	738	966	–	–
IM03	ABR	7/30/2024	14:35	3.5	11.5	12.3	0.47	–	–	–	–	–	–	–
IM03	ABR	7/30/2024	14:35	4.0	13.1	12.0	0.55	8.20	92.0	9.90	835	1,110	–	–
IM06	ABR	7/30/2024	15:10	0.0	0.0	14.0	0.57	8.12	98.5	10.15	905	1,145	–	–
IM06	ABR	7/30/2024	15:10	0.5	1.6	13.9	0.57	–	–	–	–	–	–	–
IM06	ABR	7/30/2024	15:10	1.0	3.3	13.5	0.59	8.28	94.7	9.77	926	1,188	–	–
IM06	ABR	7/30/2024	15:10	1.5	4.9	13.4	0.59	–	–	–	–	–	–	–
IM06	ABR	7/30/2024	15:10	2.0	6.6	13.3	0.59	8.33	97.3	10.17	915	1,178	–	–
IM06	ABR	7/30/2024	15:10	2.5	8.2	12.6	0.59	–	–	–	–	–	–	–
IM06	ABR	7/30/2024	15:10	3.0	9.8	12.4	0.61	8.38	99.1	10.53	920	1,212	–	–
IM06	ABR	7/30/2024	15:10	3.5	11.5	12.3	0.61	–	–	–	–	–	–	–
IM09	ABR	7/30/2024	15:35	0.0	0.0	16.3	0.50	7.94	95.2	9.35	839	1,007	–	–
IM09	ABR	7/30/2024	15:35	0.5	1.6	15.0	0.47	–	–	–	–	–	–	–
IM09	ABR	7/30/2024	15:35	1.0	3.3	13.6	0.41	8.02	91.8	9.51	645	826	–	–
IM09	ABR	7/30/2024	15:35	1.5	4.9	13.2	0.39	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM09	ABR	7/30/2024	15:35	2.0	6.6	12.7	0.36	8.13	97.5	10.31	566	739	–	–
IM09	ABR	7/30/2024	15:35	2.5	8.2	12.1	0.36	–	–	–	–	–	–	–
IM09	ABR	7/30/2024	15:35	3.0	9.8	11.5	0.50	8.25	93.1	10.13	752	1,013	–	–
IM08a	ABR	7/30/2024	16:00	0.0	0.0	14.9	0.50	8.31	107.0	10.78	804	1,000	–	–
IM08a	ABR	7/30/2024	16:00	0.5	1.6	14.2	0.55	–	–	–	–	–	–	–
IM08a	ABR	7/30/2024	16:00	1.0	3.3	13.4	0.64	8.53	102.4	10.61	993	1,274	–	–
IM08a	ABR	7/30/2024	16:00	1.5	4.9	13.3	0.65	–	–	–	–	–	–	–
IM08a	ABR	7/30/2024	16:00	2.0	6.6	13.1	0.65	8.53	100.1	10.59	1004	1,298	–	–
IM08a	ABR	7/30/2024	16:00	2.5	8.2	13.1	0.65	–	–	–	–	–	–	–
IM08a	ABR	7/30/2024	16:00	3.0	9.8	13.1	0.66	8.43	96.1	10.02	1012	1,312	–	–
IM12	ABR	7/30/2024	16:35	0.0	0.0	13.9	0.38	8.09	107.1	11.02	609	773	–	–
IM12	ABR	7/30/2024	16:35	0.5	1.6	14.0	0.38	–	–	–	–	–	–	–
IM12	ABR	7/30/2024	16:35	1.0	3.3	13.9	0.38	8.25	106.7	11.00	612	776	–	–
IM12	ABR	7/30/2024	16:35	1.5	4.9	14.0	0.38	–	–	–	–	–	–	–
IM12	ABR	7/30/2024	16:35	2.0	6.6	13.1	0.39	8.21	102.1	10.72	615	795	–	–
IM12	ABR	7/30/2024	16:35	2.5	8.2	13.2	0.40	–	–	–	–	–	–	–
IM12	ABR	7/30/2024	16:35	3.0	9.8	12.9	0.41	8.20	101.0	10.63	641	833	–	–
IM11a	ABR	7/30/2024	17:10	0.0	0.0	14.1	0.35	7.95	109.3	11.22	565	715	–	–
IM11a	ABR	7/30/2024	17:10	0.5	1.6	14.1	0.35	–	–	–	–	–	–	–
IM11a	ABR	7/30/2024	17:10	1.0	3.3	14.0	0.36	8.10	107.3	11.00	574	729	–	–
IM11a	ABR	7/30/2024	17:10	1.5	4.9	14.0	0.36	–	–	–	–	–	–	–
IM11a	ABR	7/30/2024	17:10	2.0	6.6	13.9	0.39	8.15	106.0	11.03	640	788	–	–
IM11a	ABR	7/30/2024	17:10	2.5	8.2	13.8	0.38	–	–	–	–	–	–	–
IM11a	ABR	7/30/2024	17:10	3.0	9.8	13.1	0.50	8.18	102.7	10.79	776	996	–	–
IM10a	ABR	7/30/2024	17:30	0.0	0.0	13.5	0.14	7.91	105.9	11.03	229.1	292.3	–	–
IM10a	ABR	7/30/2024	17:30	0.5	1.6	13.4	0.14	–	–	–	–	–	–	–
IM10a	ABR	7/30/2024	17:30	1.0	3.3	13.4	0.14	8.00	104.4	10.91	229.1	294.1	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM10a	ABR	7/30/2024	17:30	1.5	4.9	13.4	0.14	–	–	–	–	–	–	–
IM10a	ABR	7/30/2024	17:30	2.0	6.6	13.2	0.14	8.06	104.0	10.87	229.1	294.3	–	–
IM10a	ABR	7/30/2024	17:30	2.5	8.2	13.0	0.14	–	–	–	–	–	–	–
IM10a	ABR	7/30/2024	17:30	3.0	9.8	13.0	0.14	8.03	103.0	10.87	228	297.7	–	–
IM07a	ABR	7/31/2024	8:55	0.0	0.0	13.3	0.23	7.72	85.0	8.85	410.7	530.2	–	–
IM07a	ABR	7/31/2024	8:55	0.5	1.6	13.3	0.26	–	–	–	–	–	–	–
IM07a	ABR	7/31/2024	8:55	1.0	3.3	13.3	0.26	7.83	84.0	8.87	413.6	534.1	4.05	178
IM07a	ABR	7/31/2024	8:55	1.5	4.9	13.3	0.26	–	–	–	–	–	–	–
IM07a	ABR	7/31/2024	8:55	2.0	6.6	13.3	0.26	7.89	92.6	9.70	408.4	527.1	–	–
IM07a	ABR	7/31/2024	8:55	2.5	8.2	13.3	0.25	–	–	–	–	–	–	–
IM07a	ABR	7/31/2024	8:55	3.0	9.8	13.3	0.25	7.89	94.9	9.93	403	519.3	15.3	215
IM01a	ABR	7/31/2024	11:20	0.0	0.0	13.2	0.57	7.97	74.7	7.81	883	1,142	–	–
IM01a	ABR	7/31/2024	11:20	0.5	1.6	13.1	0.57	–	–	–	–	–	–	–
IM01a	ABR	7/31/2024	11:20	1.0	3.3	13.1	0.57	8.16	76.1	7.97	884	1,143	–	–
IM01a	ABR	7/31/2024	11:20	1.5	4.9	13.1	0.57	–	–	–	–	–	–	–
IM01a	ABR	7/31/2024	11:20	2.0	6.6	13.1	0.57	8.23	92.7	9.77	887	1,148	–	–
IM01a	ABR	7/31/2024	11:20	2.5	8.2	13.1	0.58	–	–	–	–	–	–	–
IM01a	ABR	7/31/2024	11:20	3.0	9.8	13.1	0.58	8.26	98.8	10.36	893	1,156	–	–
IM01a	ABR	7/31/2024	11:20	3.5	11.5	13.1	0.58	–	–	–	–	–	–	–
IM01a	ABR	7/31/2024	11:20	4.0	13.1	13.1	0.58	8.27	99.9	10.48	899	1,165	–	–
IM04a	ABR	7/31/2024	12:00	0.0	0.0	13.0	0.55	7.97	95.9	10.06	855	1,110	–	–
IM04a	ABR	7/31/2024	12:00	0.5	1.6	13.0	0.55	–	–	–	–	–	–	–
IM04a	ABR	7/31/2024	12:00	1.0	3.3	13.0	0.55	8.15	94.8	9.97	852	1,108	–	–
IM04a	ABR	7/31/2024	12:00	1.5	4.9	13.0	0.55	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	0.0	0.0	12.5	1.46	7.79	97.1	9.24	2,125	2,792	–	–
IM02	ABR	8/1/2024	10:00	0.5	1.6	12.5	1.46	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	1.0	3.3	12.5	1.45	8.02	94.9	10.05	2,119	2,783	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM02	ABR	8/1/2024	10:00	1.5	4.9	12.5	1.45	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	2.0	6.6	12.5	1.46	8.06	95.5	10.07	2,134	2,801	2.86	237
IM02	ABR	8/1/2024	10:00	2.5	8.2	12.5	1.47	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	3.0	9.8	12.5	1.46	8.06	94.8	10.04	2,130	2,800	–	–
IM02	ABR	8/1/2024	10:00	3.5	11.5	12.5	1.49	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	4.0	13.1	12.5	1.58	8.06	94.3	9.97	2,290	3,017	–	–
IM02	ABR	8/1/2024	10:00	4.5	14.8	12.5	2.12	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	5.0	16.4	12.7	2.73	7.97	91.2	9.49	3,954	5,191	1.35	230
IM02	ABR	8/1/2024	10:00	5.5	18.0	12.9	3.40	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	6.0	19.7	12.8	4.08	7.93	89.2	9.18	5,656	7,365	–	–
IM02	ABR	8/1/2024	10:00	6.5	21.3	12.8	4.12	–	–	–	–	–	–	–
IM02	ABR	8/1/2024	10:00	7.0	23.0	12.8	4.12	7.92	89.4	9.25	5,705	7,436	–	–
IM13	ABR	9/10/2024	16:30	0.0	0.0	9.0	2.38	7.88	81.2	9.26	3,096	4,454	–	–
IM13	ABR	9/10/2024	16:30	0.5	1.6	8.9	2.84	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	1.0	3.3	8.9	3.53	7.86	92.8	10.55	4,453	6,421	–	–
IM13	ABR	9/10/2024	16:30	1.5	4.9	8.9	4.00	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	2.0	6.6	8.9	4.03	7.86	94.6	10.69	5,050	7,293	–	–
IM13	ABR	9/10/2024	16:30	2.5	8.2	8.9	4.07	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	3.0	9.8	8.9	4.31	7.85	96.0	10.83	5,361	7,707	–	–
IM13	ABR	9/10/2024	16:30	3.5	11.5	8.9	4.62	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	4.0	13.1	8.8	5.09	7.83	93.1	10.48	6,247	9,043	–	–
IM13	ABR	9/10/2024	16:30	4.5	14.8	8.8	5.16	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	5.0	16.4	8.8	5.48	7.82	94.4	10.57	6,682	9,655	–	–
IM13	ABR	9/10/2024	16:30	5.5	18.0	8.8	5.55	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	6.0	19.7	8.8	5.70	7.83	93.4	10.45	6,929	10,109	–	–
IM13	ABR	9/10/2024	16:30	6.5	21.3	8.8	5.94	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	7.0	23.0	8.8	6.24	7.81	93.1	10.39	7,554	10,887	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM13	ABR	9/10/2024	16:30	7.5	24.6	8.8	6.69	–	–	–	–	–	–	–
IM13	ABR	9/10/2024	16:30	8.0	26.2	8.8	6.73	7.80	92.9	10.33	8,186	12,041	–	–
IM03	ABR	9/10/2024	18:20	0.0	0.0	9.1	0.69	8.46	122.5	13.33	959	1,378	–	–
IM03	ABR	9/10/2024	18:20	0.5	1.6	8.9	0.80	–	–	–	–	–	–	–
IM03	ABR	9/10/2024	18:20	1.0	3.3	8.8	1.00	8.38	101.2	11.67	1,362	1,995	–	–
IM03	ABR	9/10/2024	18:20	1.5	4.9	8.9	1.23	–	–	–	–	–	–	–
IM03	ABR	9/10/2024	18:20	2.0	6.6	8.9	1.34	8.30	100.2	11.46	1,789	2,585	–	–
IM03	ABR	9/10/2024	18:20	2.5	8.2	8.9	1.36	–	–	–	–	–	–	–
IM03	ABR	9/10/2024	18:20	3.0	9.8	8.9	1.39	8.27	99.3	11.37	1,852	2,682	–	–
IM03	ABR	9/10/2024	18:20	3.5	11.5	8.9	1.42	–	–	–	–	–	–	–
IM03	ABR	9/10/2024	18:20	4.0	13.1	8.8	7.99	7.65	80.3	8.86	9,621	14,199	–	–
IM03	ABR	9/10/2024	18:20	4.5	14.8	8.8	10.96	–	–	–	–	–	–	–
IM05a	ABR	9/10/2024	18:40	0.0	0.0	9.1	1.13	8.33	101.6	11.60	1,522	2,189	–	–
IM05a	ABR	9/10/2024	18:40	0.5	1.6	9.2	1.13	–	–	–	–	–	–	–
IM05a	ABR	9/10/2024	18:40	1.0	3.3	9.1	1.13	8.33	102.6	11.68	1,525	2,195	–	–
IM05a	ABR	9/10/2024	18:40	1.5	4.9	9.0	1.15	–	–	–	–	–	–	–
IM05a	ABR	9/10/2024	18:40	2.0	6.6	8.9	1.16	8.30	99.8	11.48	1,555	2,244	–	–
IM05a	ABR	9/10/2024	18:40	2.5	8.2	8.9	1.17	–	–	–	–	–	–	–
IM05a	ABR	9/10/2024	18:40	3.0	9.8	8.9	1.29	8.25	99.8	11.39	1,724	2,484	–	–
IM05a	ABR	9/10/2024	18:40	3.5	11.5	8.9	1.36	–	–	–	–	–	–	–
IM05a	ABR	9/10/2024	18:40	4.0	13.1	8.9	2.94	7.89	96.7	10.77	3,746	5,273	–	–
IM07a	ABR	9/11/2024	15:30	0.0	0.0	9.3	0.61	8.01	82.5	9.44	858	1,225	–	–
IM07a	ABR	9/11/2024	15:30	0.5	1.6	9.1	0.64	–	–	–	–	–	–	–
IM07a	ABR	9/11/2024	15:30	1.0	3.3	9.0	0.71	8.00	91.8	10.72	976	1,395	3.27	–
IM07a	ABR	9/11/2024	15:30	1.5	4.9	8.9	0.76	–	–	–	–	–	–	–
IM07a	ABR	9/11/2024	15:30	2.0	6.6	8.9	0.82	7.97	99.5	11.49	1,120	1,617	–	–
IM07a	ABR	9/11/2024	15:30	2.5	8.2	8.9	0.84	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM07a	ABR	9/11/2024	15:30	3.0	9.8	8.9	0.85	7.94	95.8	11.03	1,161	1,677	3.49	–
IM08a	ABR	9/11/2024	16:30	0.0	0.0	9.6	0.59	8.14	82.7	9.47	834	1,182	–	–
IM08a	ABR	9/11/2024	16:30	0.5	1.6	9.4	0.59	–	–	–	–	–	–	–
IM08a	ABR	9/11/2024	16:30	1.0	3.3	9.3	0.59	8.16	98.2	11.30	830	1,186	–	–
IM08a	ABR	9/11/2024	16:30	1.5	4.9	9.1	0.60	–	–	–	–	–	–	–
IM08a	ABR	9/11/2024	16:30	2.0	6.6	8.9	0.61	8.12	104.7	12.03	848	1,225	–	–
IM08a	ABR	9/11/2024	16:30	2.5	8.2	8.8	2.24	–	–	–	–	–	–	–
IM08a	ABR	9/11/2024	16:30	3.0	9.8	8.8	2.73	7.66	91.1	10.02	3,491	5,009	–	–
IM08a	ABR	9/11/2024	16:30	3.5	11.5	8.8	7.38	–	–	–	–	–	–	–
IM10a	ABR	9/11/2024	16:47	0.0	0.0	9.7	0.82	8.16	100.6	11.31	1,145	1,618	–	–
IM10a	ABR	9/11/2024	16:47	0.5	1.6	9.5	0.83	–	–	–	–	–	–	–
IM10a	ABR	9/11/2024	16:47	1.0	3.3	9.4	0.84	8.17	102.7	11.71	1,163	1,655	–	–
IM10a	ABR	9/11/2024	16:47	1.5	4.9	9.3	0.85	–	–	–	–	–	–	–
IM10a	ABR	9/11/2024	16:47	2.0	6.6	9.2	0.86	8.15	100.2	11.42	1,180	1,692	–	–
IM10a	ABR	9/11/2024	16:47	2.5	8.2	9.1	0.86	–	–	–	–	–	–	–
IM10a	ABR	9/11/2024	16:47	3.0	9.8	9.1	0.88	8.07	99.7	11.31	1,206	1,729	–	–
IM11a	ABR	9/11/2024	17:00	0.0	0.0	9.5	0.49	8.22	101.5	11.53	692	984	–	–
IM11a	ABR	9/11/2024	17:00	0.5	1.6	9.4	0.50	–	–	–	–	–	–	–
IM11a	ABR	9/11/2024	17:00	1.0	3.3	9.3	0.55	8.21	102.2	11.75	758	1,077	–	–
IM11a	ABR	9/11/2024	17:00	1.5	4.9	9.0	0.76	–	–	–	–	–	–	–
IM11a	ABR	9/11/2024	17:00	2.0	6.6	9.0	0.80	8.15	99.6	11.38	1,091	1,571	–	–
IM11a	ABR	9/11/2024	17:00	2.5	8.2	9.0	0.86	–	–	–	–	–	–	–
IM11a	ABR	9/11/2024	17:00	3.0	9.8	8.9	0.98	7.95	94.2	10.64	1,328	1,914	–	–
IM11a	ABR	9/11/2024	17:00	3.5	11.5	8.9	1.01	–	–	–	–	–	–	–
IM12	ABR	9/11/2024	17:12	0.0	0.0	9.4	0.21	8.22	103.6	11.81	301.6	430.2	–	–
IM12	ABR	9/11/2024	17:12	0.5	1.6	9.1	0.21	–	–	–	–	–	–	–
IM12	ABR	9/11/2024	17:12	1.0	3.3	8.8	0.24	8.24	101.2	11.93	346.5	501.8	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM12	ABR	9/11/2024	17:12	1.5	4.9	8.8	0.36	–	–	–	–	–	–	–
IM12	ABR	9/11/2024	17:12	2.0	6.6	8.9	0.62	8.13	96.3	11.13	844	1,171	–	–
IM12	ABR	9/11/2024	17:12	2.5	8.2	8.9	0.89	–	–	–	–	–	–	–
IM12	ABR	9/11/2024	17:12	3.0	9.8	8.9	1.05	7.92	91.5	10.33	1,424	2,054	–	–
IM09	ABR	9/11/2024	17:33	0.0	0.0	9.4	0.54	8.24	102.2	11.71	761	1,084	–	–
IM09	ABR	9/11/2024	17:33	0.5	1.6	9.3	0.55	–	–	–	–	–	–	–
IM09	ABR	9/11/2024	17:33	1.0	3.3	9.2	0.55	8.26	102.2	11.78	766	1,095	–	–
IM09	ABR	9/11/2024	17:33	1.5	4.9	9.2	0.56	–	–	–	–	–	–	–
IM09	ABR	9/11/2024	17:33	2.0	6.6	9.1	0.60	8.23	102.5	11.61	832	832	–	–
IM09	ABR	9/11/2024	17:33	2.5	8.2	8.7	1.24	–	–	–	–	–	–	–
IM09	ABR	9/11/2024	17:33	3.0	9.8	8.7	1.48	7.93	91.2	10.44	1943	7.93	–	–
IM09	ABR	9/11/2024	17:33	3.5	11.5	8.8	1.91	–	–	–	–	–	–	–
IM06	ABR	9/11/2024	17:50	0.0	0.0	9.5	0.92	8.20	102.9	11.69	1,264	1,796	–	–
IM06	ABR	9/11/2024	17:50	0.5	1.6	9.5	0.92	–	–	–	–	–	–	–
IM06	ABR	9/11/2024	17:50	1.0	3.3	9.2	0.95	8.23	103.2	11.80	1,300	1,863	–	–
IM06	ABR	9/11/2024	17:50	1.5	4.9	9.2	1.00	–	–	–	–	–	–	–
IM06	ABR	9/11/2024	17:50	2.0	6.6	9.2	1.03	8.20	103.4	11.68	1,401	2,008	–	–
IM06	ABR	9/11/2024	17:50	2.5	8.2	9.0	1.14	–	–	–	–	–	–	–
IM06	ABR	9/11/2024	17:50	3.0	9.8	9.0	1.51	8.06	93.8	10.67	2,002	2,884	–	–
IM06	ABR	9/11/2024	17:50	3.5	11.5	8.9	1.98	–	–	–	–	–	–	–
IM06	ABR	9/11/2024	17:50	4.0	13.1	8.8	6.61	7.53	75.5	8.43	8,017	11,602	–	–
IM02	ABR	9/11/2024	18:15	0.0	0.0	9.5	0.81	8.24	102.4	11.56	1,121	1,591	–	–
IM02	ABR	9/11/2024	18:15	0.5	1.6	9.5	0.81	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	1.0	3.3	9.0	0.90	8.22	101.2	11.44	1,228	1,769	–	–
IM02	ABR	9/11/2024	18:15	1.5	4.9	8.9	0.95	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	2.0	6.6	8.9	0.99	8.20	100.2	11.43	1,344	1,938	2.55	261
IM02	ABR	9/11/2024	18:15	2.5	8.2	8.9	1.01	–	–	–	–	–	–	–

Appendix D. Continued.

Site ID[a]	Contractor	Date	Time	Depth (m)	Depth (ft)	Temp. (C°)	Salinity (ppt)	pH	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Spec. Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)
IM02	ABR	9/11/2024	18:15	3.0	9.8	8.9	1.03	8.18	101.4	11.64	1,289	2,003	–	–
IM02	ABR	9/11/2024	18:15	3.5	11.5	8.9	1.05	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	4.0	13.1	8.9	1.31	8.04	95.8	10.99	1,749	2,518	–	–
IM02	ABR	9/11/2024	18:15	4.5	14.8	8.9	2.23	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	5.0	16.4	8.9	4.48	7.65	83.9	9.45	5,518	7,927	3.26	217
IM02	ABR	9/11/2024	18:15	5.5	18.0	8.8	8.28	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	6.0	19.7	8.8	9.99	7.34	66.4	7.24	11,728	17,027	–	–
IM02	ABR	9/11/2024	18:15	6.5	21.3	8.8	10.37	–	–	–	–	–	–	–
IM02	ABR	9/11/2024	18:15	7.0	23.0	8.8	10.46	7.39	68.2	7.40	12,248	17,703	–	–
IM02	ABR	9/11/2024	18:15	7.5	24.6	8.8	10.49	–	–	–	–	–	–	–
IM01a	ABR	9/11/2024	19:20	0.0	0.0	9.7	1.00	8.23	116.6	12.85	1,377	1,945	–	–
IM01a	ABR	9/11/2024	19:20	0.5	1.6	9.3	0.99	–	–	–	–	–	–	–
IM01a	ABR	9/11/2024	19:20	1.0	3.3	9.1	1.01	8.23	106.7	12.17	1,380	1,977	–	–
IM01a	ABR	9/11/2024	19:20	1.5	4.9	8.9	1.03	–	–	–	–	–	–	–
IM01a	ABR	9/11/2024	19:20	2.0	6.6	8.9	1.03	8.20	103.4	11.81	1,394	2,015	–	–
IM01a	ABR	9/11/2024	19:20	2.5	8.2	8.9	1.04	–	–	–	–	–	–	–
IM01a	ABR	9/11/2024	19:20	3.0	9.8	8.9	1.06	8.17	100.4	11.59	1,431	2,070	–	–
IM01a	ABR	9/11/2024	19:20	3.5	11.5	8.9	1.42	–	–	–	–	–	–	–
IM04a	ABR	9/11/2024	19:36	0.0	0.0	9.9	0.73	8.27	103.5	11.50	1,032	1,447	–	–
IM04a	ABR	9/11/2024	19:36	0.5	1.6	9.3	0.87	–	–	–	–	–	–	–
IM04a	ABR	9/11/2024	19:36	1.0	3.3	9.1	0.92	8.26	102.9	11.52	1,245	1,789	–	–
IM04a	ABR	9/11/2024	19:36	1.5	4.9	8.9	0.96	–	–	–	–	–	–	–
IM04a	ABR	9/11/2024	19:36	2.0	6.6	8.9	0.97	8.19	100.2	11.41	1,315	1,901	–	–
IM04a	ABR	9/11/2024	19:36	2.5	8.2	8.9	0.97	–	–	–	–	–	–	–

[a] A lower case 'a' at the end of a Site ID refers to an alternate site slightly upstream or downstream of the original site location.
NR = pH determined to be inaccurate and not reported

Appendix E. Sample collection methods, containers, preservation, and holding times for water quality surveys conducted at the Graphite Creek Project near Teller, Alaska, 2014–2025.

Analyte	Year	Laboratory	Method	Container	Container Volume	Preservation	Holding Time
Total Suspended Solids	2023–2025	ALS	E160	HDPE	250 mL	0–6 C	7 days
	2021–2022	ACZ	E160				
	2015–2016, 2018–2019	ARS	SM2540D				
	2014	SGS	SM2540D				
Total Dissolved Solids	2023–2025	ALS	E162	HDPE	250 mL	0–6 C	7 days
	2021–2022	ACZ	SM2540C				
	2015–2016, 2018–2019	ARS	SM2540C				
	2014	SGS	SM2540C				
Chloride, Sulfate, Fluoride	2023–2025	ALS	E235	HDPE	250 mL	0–6 C	28 days
	2021–2022	ACZ	M300				
	2015–2016, 2018–2019	ARS	E300				
	2014	SGS	E300				
Nitrate as N, Nitrite as N	2023–2025	ALS	E235	HDPE	250 mL	0–6 C	3 days
	2021–2022	ACZ	M353.2				
	2015–2016, 2018–2019	ARS	4500-NO3E				
	2014	SGS	SM 4500F				
Alkalinity	2023–2025	ALS	E290	HDPE	250 mL	0–6 C	14 days
	2021–2022	ACZ	SM2320B				
	2015–2016, 2018–2019	ARS	SM2320B				
	2014	SGS	SM2320B				
Hardness	2023–2025	ALS	EC100	HDPE	250 mL	0–6 C	180 days
	2021–2022	ACZ	SM2340B				
	2015–2016, 2018–2019	ARS	E200.7				
	2014	SGS	E200.8				

Appendix E. Continued.

Analyte	Year	Laboratory	Method	Container	Container Volume	Preservation	Holding Time
Total Metals	2023–2025	ALS	E420	HDPE	125 mL	Sample will be preserved upon receipt at the lab	180 days
	2021–2022	ACZ	M200.8				
	2015–2016, 2018–2019	ARS	E200.8				
	2014	SGS	E200.8				
Dissolved Metals	2023–2025	ALS	E421	HDPE	125 mL	Sample will be preserved upon receipt at the lab, field filtering for dissolved metals is strongly recommended	180 days
	2021–2022	ACZ	M200.8				
	2015–2016, 2018–2019	ARS	E200.8				
	2014	SGS	E200.8				
Ammonia, Kjeldahl Nitrogen	2023–2025	ALS	E298; E318	Amber glass with septa cap	100 mL	H2SO4	28 days
	2021–2022	ACZ	M350.1				
	2015–2016, 2018–2019	ARS	E350.1				
	2014	SGS	SM4500				
Cyanide Total, Cyanide WAD	2023–2025	ALS	E333	Opaque HDPE	60 mL	NaOH	14 days
	2021–2022	ACZ	M335.4				
	2015–2016, 2018–2019	ARS	SM4500				
	2014	SGS	SM4500				
Total Mercury	2023–2025	ALS	E508-L	Teflon or glass amber	100 mL	Sample will be preserved upon receipt at the lab	28 days
	2021–2022	ACZ	M1631E				

Appendix E. Continued.

Analyte	Year	Laboratory	Method	Container	Container Volume	Preservation	Holding Time
	2015–2016, 2018–2019	ARS	E1631E				
	2014	SGS	E1631E				

Note: Container volumes differ by laboratory and test being performed. Container type is assumed to be similar (i.e., glass versus HDPE). Preservation types and holding times are also assumed to be the same across all labs.

Appendix F. Comparability of Laboratories and Contractors Analysis.

INTRODUCTION

Surface water quality sampling at GCP has occurred over a 12-year period. During that time there have been four laboratories used to analyze water chemistry samples, with differing methods that were used for analysis, and with field sampling performed by multiple contractors. Given all these potential sources of variability, it becomes important to ensure, to the extent possible, that the data from these groups is comparable and useable as a single data set.

The type of statistics referred to as equivalence testing assumes that all classes are different and attempts to prove that they are not different. This is the opposite of most statistics which assume that all classes are part of the overall population and tests are employed to prove that one or more classes are not the same. There are a limited number of tests available to test equivalence. The applicability of these tests breaks down when there are many groups and there is no replication (e.g., duplicate samples collected at the same time, at the same site, were not sent to two labs allowing direct comparison of the labs). Therefore, we took a qualitative and quantitative approach. Our assumption is that all the data can be used as one dataset and we tried to identify any member of a group (e.g., a particular lab in the lab group) that is so different that it appeared to not be part of the larger dataset and that the difference could not be explained. For example, results for a particular lab may appear high, but can we confidently say the apparent difference is not due to interannual variation?

METHODS

To examine whether there were any indications of substantial bias associated with using different laboratories and methods in different years, we tested for differences among 6 metals (total aluminum, total cadmium, total cobalt, total copper, total iron, and total nickel) in surface water samples from 2014–2025. Because different laboratories and methods were used in different years, the comparison among labs and methods was confounded by interannual variability. Any observed differences among labs or methods could also be caused by interannual variability and the effects would be impossible to completely disentangle statistically. Because any potential biases would be likely to make all results from one lab or method either too high or too low, looking for obvious patterns among years that correspond to different labs or methods provides strong circumstantial evidence that a bias is occurring. We therefore plotted year effects after correcting for other sources of variability such as waterbody, month, and pH levels to see if patterns in annual differences displayed signs of a lab or method bias.

In some cases we are comparing analyte concentrations to field (*in-situ*) pH. This is because holding times for laboratory analysis of pH is typically exceeded. However, in some cases we are missing field measurements. Therefore, we also compared field measurements of pH level to the corresponding analytical laboratory results for pH. If linear, we could use laboratory pH as a proxy for field measurements in some cases.

We ran general linear mixed models to examine the effect size of different factors on the interannual patterns of total metal levels. For each metal, we modeled the log-transformed value with a model that included random effects for year, waterbody, and month and a fixed effect for pH using the glmmTMB package for the statistical package R (Brooks et al. 2017, R Core Team 2025). This allowed us to plot the effects sizes of individual years after adjusting for differences among waterbodies, months, and pH. We could also examine which factors (year, waterbody, month, pH, or residual variation) best explained the variation in each metal.

RESULTS AND DISCUSSION

The metal concentrations by analyte showed similar patterns across years (Figure 1). Values tended to be low 2014–2018, increased dramatically in 2019, and then exhibited a general linearly decline from 2019–2025. Metal concentrations varied considerably among waterbodies (Figure 2). Metal concentrations were uniformly low at Cobblestone River, were low-moderate at the unnamed creeks, and were highest at Ruby and Trail creeks. However, total iron exhibits a somewhat different pattern from the other five metals examined.

There was less evidence of strong differences among months (Figure 3). In general, metal values tended to increase slightly from May to October. However, there have historically been fewer sampling events in May and in October (n = 3 total). There were some apparent differences in patterns of concentrations among laboratories (Figure 4) and methods (Figure 5), which are laboratory dependent.

The pH of water can greatly influence metal concentrations. We first compared field pH measures to laboratory pH values. These two measurements had a high correlation for all data except 2019 data (Figure 6). It appeared that some of the field measurements from 2019 had incorrect pH levels. We therefore replaced 2019 field pH values with laboratory pH values. We also replaced some missing field pH values from 2014 with the corresponding laboratory values. Data from 2018 did not have field or laboratory values for pH and are absent from analysis.

Plots of total metal levels versus pH showed strong relationships for all metals except total iron (Figure 7). For the other five metals, low pH values were strongly correlated with high metal levels. After adjusting for waterbody, month, and pH, there were few significant differences in analyte concentrations among years by laboratory or laboratory method (Figures 8–9). However, the year 2015 (a single October sampling event) had significantly lower values for aluminum, copper, and nickel. All the other 'year' and 'metal' combinations overlapped with zero, although 2019 tended to be higher and 2014–2016 tended to be lower. There were no apparent patterns in annual differences among laboratories (Figure 8) or methods (Figure 9). The ARS laboratory had both the highest and lowest values.

Water sample pH explained most of the variation in total metal concentrations for all metals except iron (Figure 10; Table 1). 'Waterbody' explained most of the variation in iron and also explained a substantial amount of variation in the other metals. 'Month' did not explain much variation (< 3%) in any models. 'Year' only explained 1–9% of the variation in any metal. The effect of pH was significant ($p < 0.001$) in all 6 metals (Table 1).

SUMMARY

Based on these results, it appears that most of the variation in the levels of these six metals can be explained by differences in waterbody and pH levels. The remaining patterns of interannual variation do not correspond to obvious laboratory or method differences. These results therefore suggest that results from different laboratories (using similar but different methods depending on the laboratory in question) are comparable among years. The results presented here strongly support the continued use of all the data for comparison across years.

Appendix F. Continued.

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Table F1. Model output from general linear mixed models of total metal values including waterbody, year, and month as random effects and pH as a fixed effect.

Analyte	Type	Parameter	Result	Error (SD)	Significance (%)
Aluminum	Fixed Effect	(Intercept)	14.0456	0.7607	< 0.001
	Fixed Effect	pH	-1.2008	0.0955	< 0.001
	Random Effect	Waterbody	1.1198	1.0582	45.70
	Random Effect	Year	0.4773	0.6909	19.50
	Random Effect	Month	0.0704	0.2654	2.90
	Random Effect	Residual	0.7807	0.8836	31.90
Cadmium	Fixed Effect	(Intercept)	3.529	0.8237	< 0.001
	Fixed Effect	pH	-0.7347	0.0743	< 0.001
	Random Effect	Waterbody	2.7899	1.6703	74.90
	Random Effect	Year	0.3111	0.5577	8.40
	Random Effect	Month	0.1854	0.4306	5
	Random Effect	Residual	0.4362	0.6605	11.70
Cobalt	Fixed Effect	(Intercept)	8.6178	0.8942	< 0.001
	Fixed Effect	pH	-1.1167	0.0858	< 0.001
	Random Effect	Waterbody	3.1565	1.7767	73.80
	Random Effect	Year	0.4867	0.6977	11.40
	Random Effect	Month	0.0515	0.2268	1.20
	Random Effect	Residual	0.5835	0.7639	13.60
Copper	Fixed Effect	(Intercept)	7.953	0.5539	< 0.001
	Fixed Effect	pH	-1.0739	0.0709	< 0.001
	Random Effect	Waterbody	0.6622	0.8137	53.60
	Random Effect	Year	0.112	0.3347	9.10
	Random Effect	Month	0.0278	0.1667	2.20
	Random Effect	Residual	0.4341	0.6588	35.10
Iron	Fixed Effect	(Intercept)	16.1215	1.2197	< 0.001
	Fixed Effect	pH	-1.6279	0.1344	< 0.001
	Random Effect	Waterbody	5.2112	2.2828	72.90
	Random Effect	Year	0.0843	0.2903	1.20
	Random Effect	Month	0.1035	0.3218	1.40
	Random Effect	Residual	1.7458	1.3213	24.40
Nickel	Fixed Effect	(Intercept)	8.9209	0.9762	< 0.001
	Fixed Effect	pH	-0.8866	0.0626	< 0.001
	Random Effect	Waterbody	4.809	2.1929	79.20
	Random Effect	Year	0.7957	0.892	13.10
	Random Effect	Month	0.1586	0.3982	2.60
	Random Effect	Residual	0.3088	0.5557	5.10

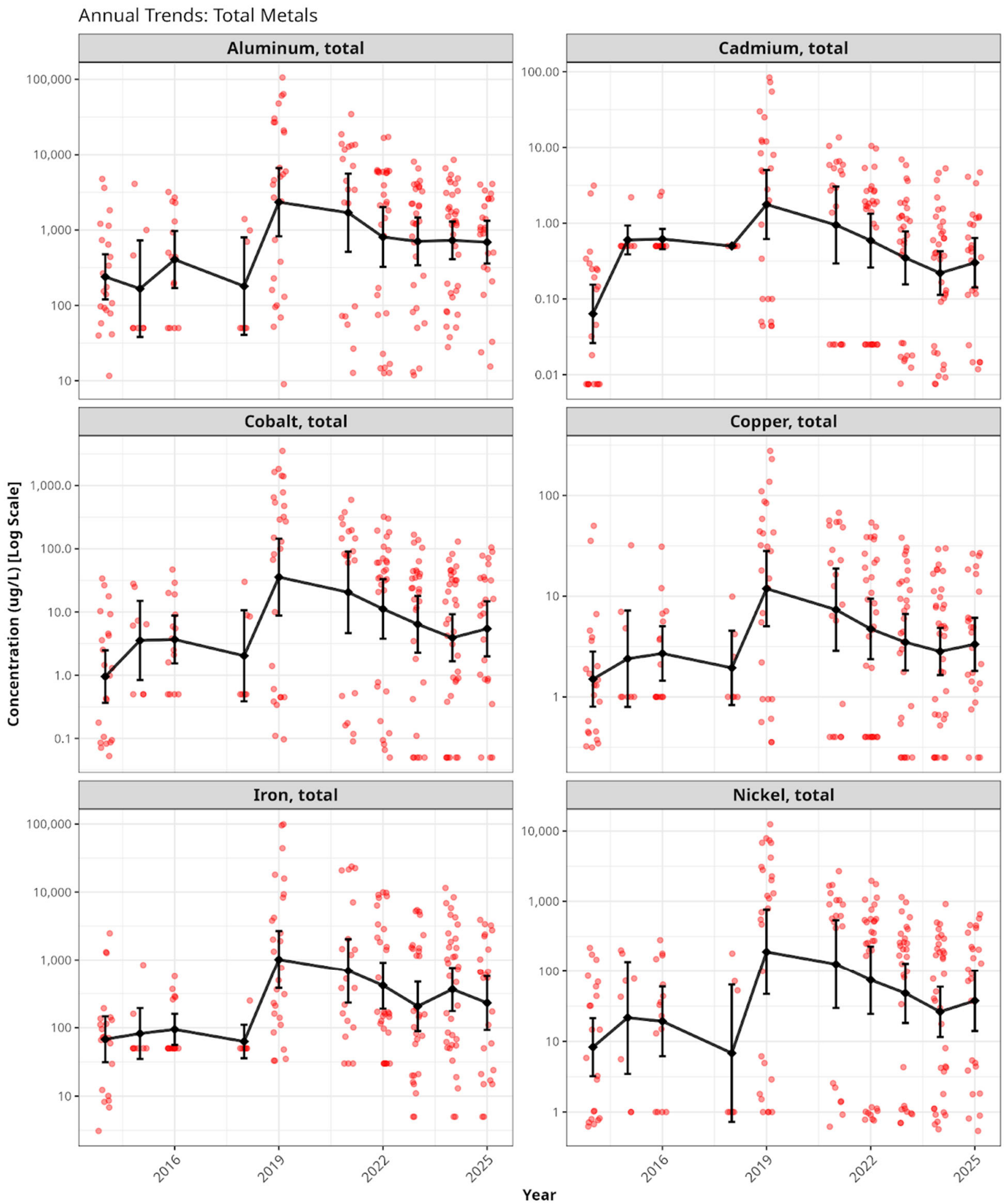

Figure F1. Total metal values by year with mean and 95% confidence interval of the mean.

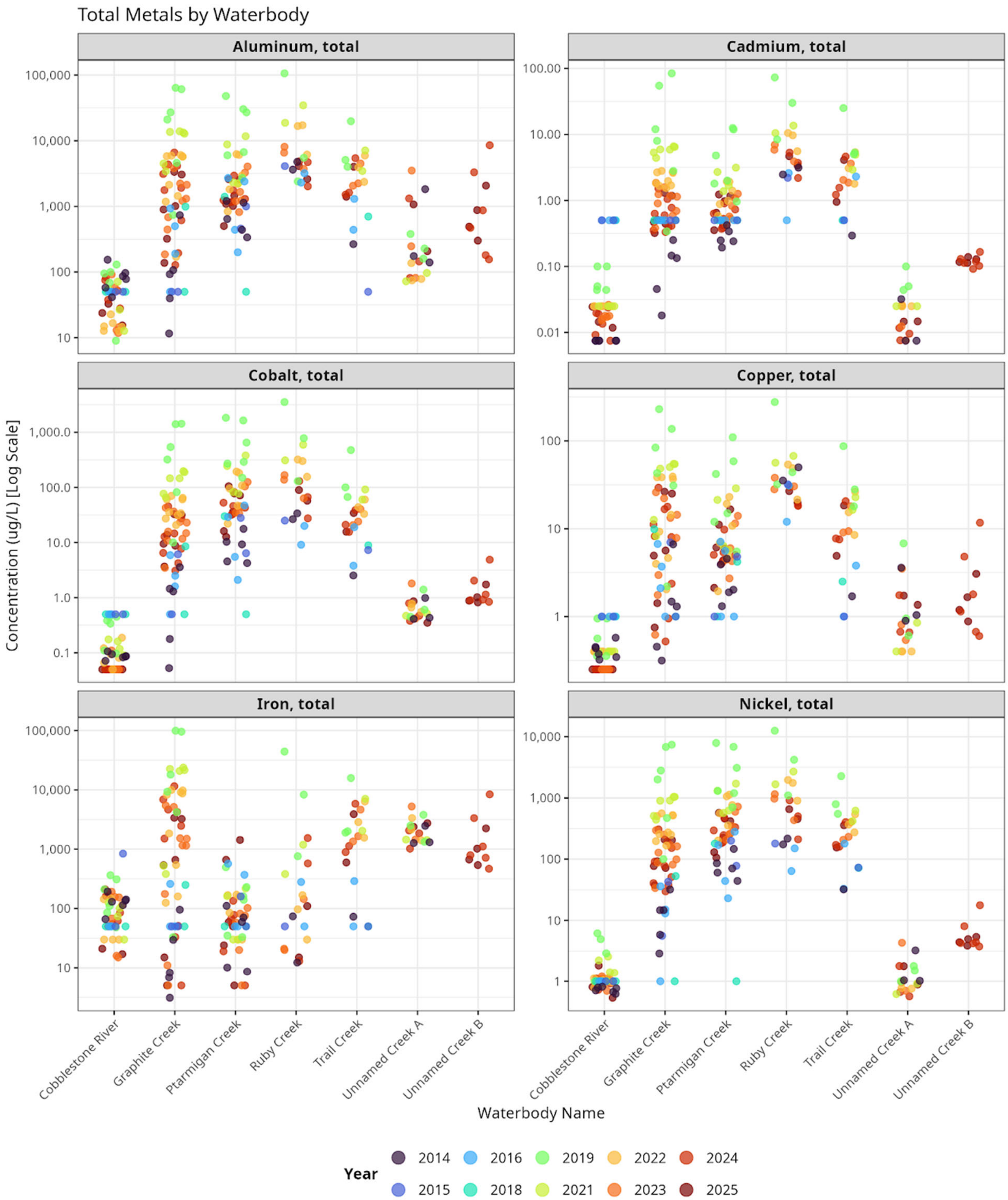

Figure F2. Total metal levels by waterbody and year.

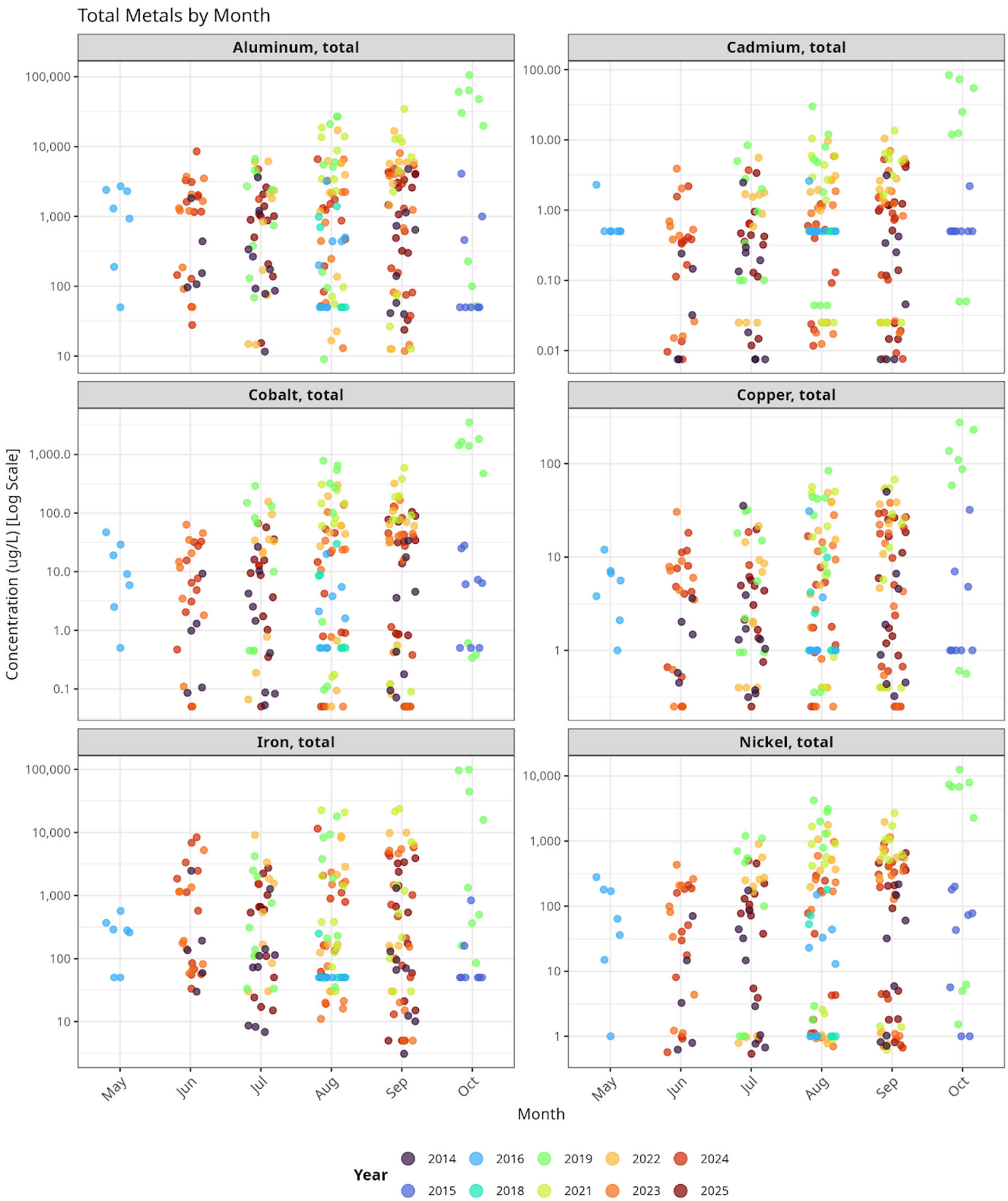

Figure F3. Total metals by month and year.

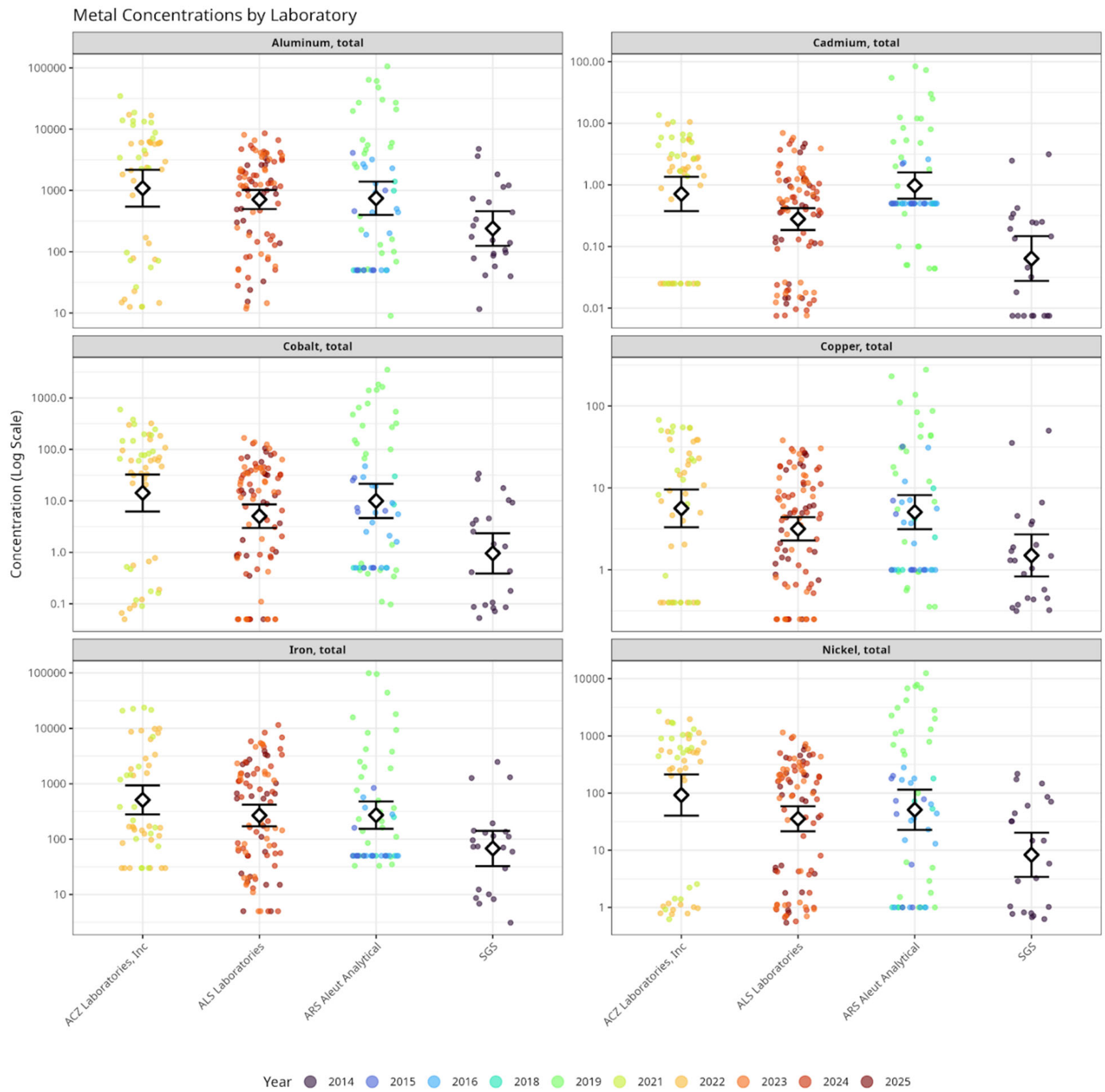

Figure F4. Total metals by laboratory and year with means and 95% confidence intervals for the means.

Figure F5. Total metals by method and year with means and 95% confidence intervals for the means.

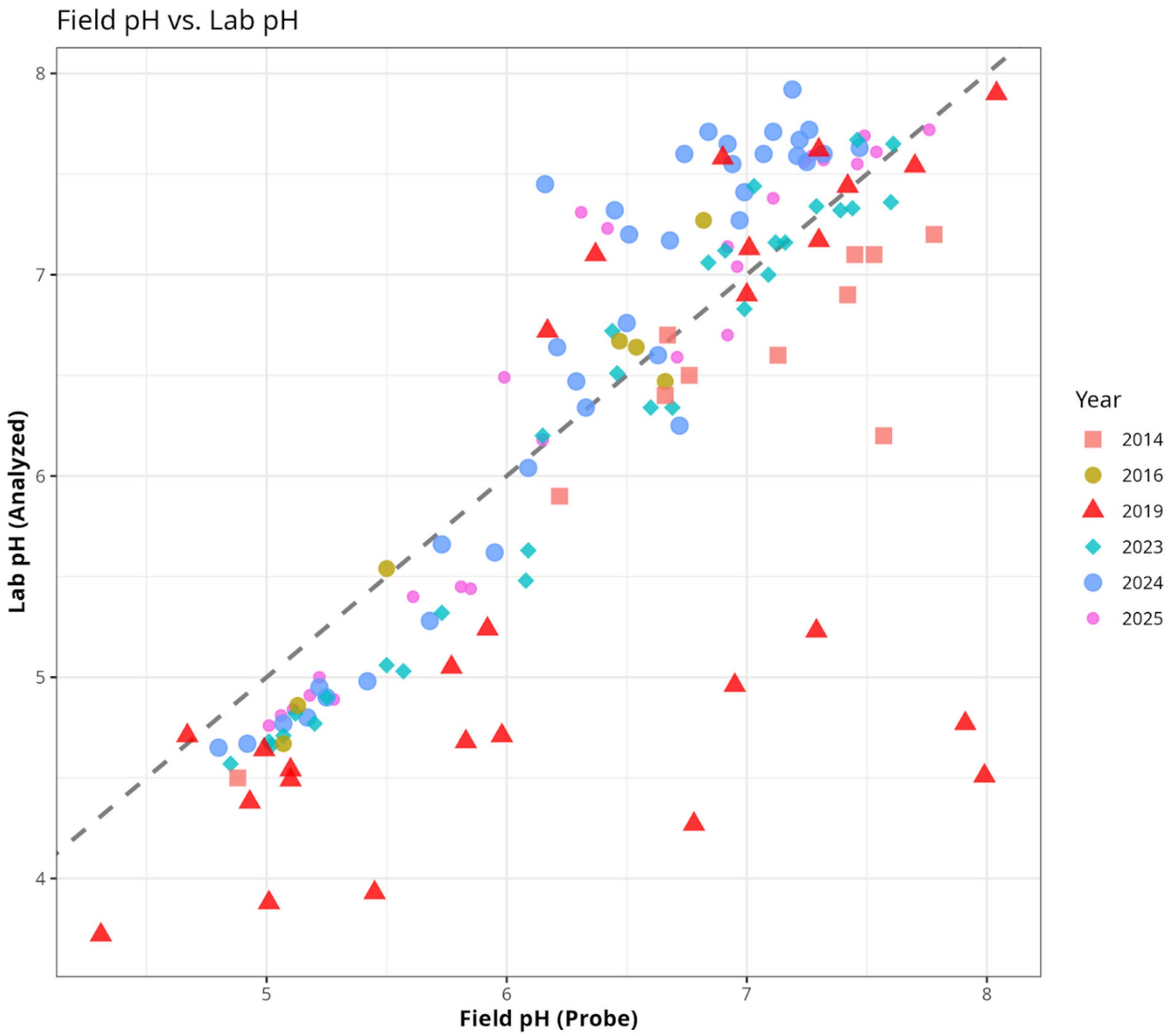

Figure F6. Comparison of field pH and lab pH values by year. Data from 2019 shows poor correlation between field and lab values.

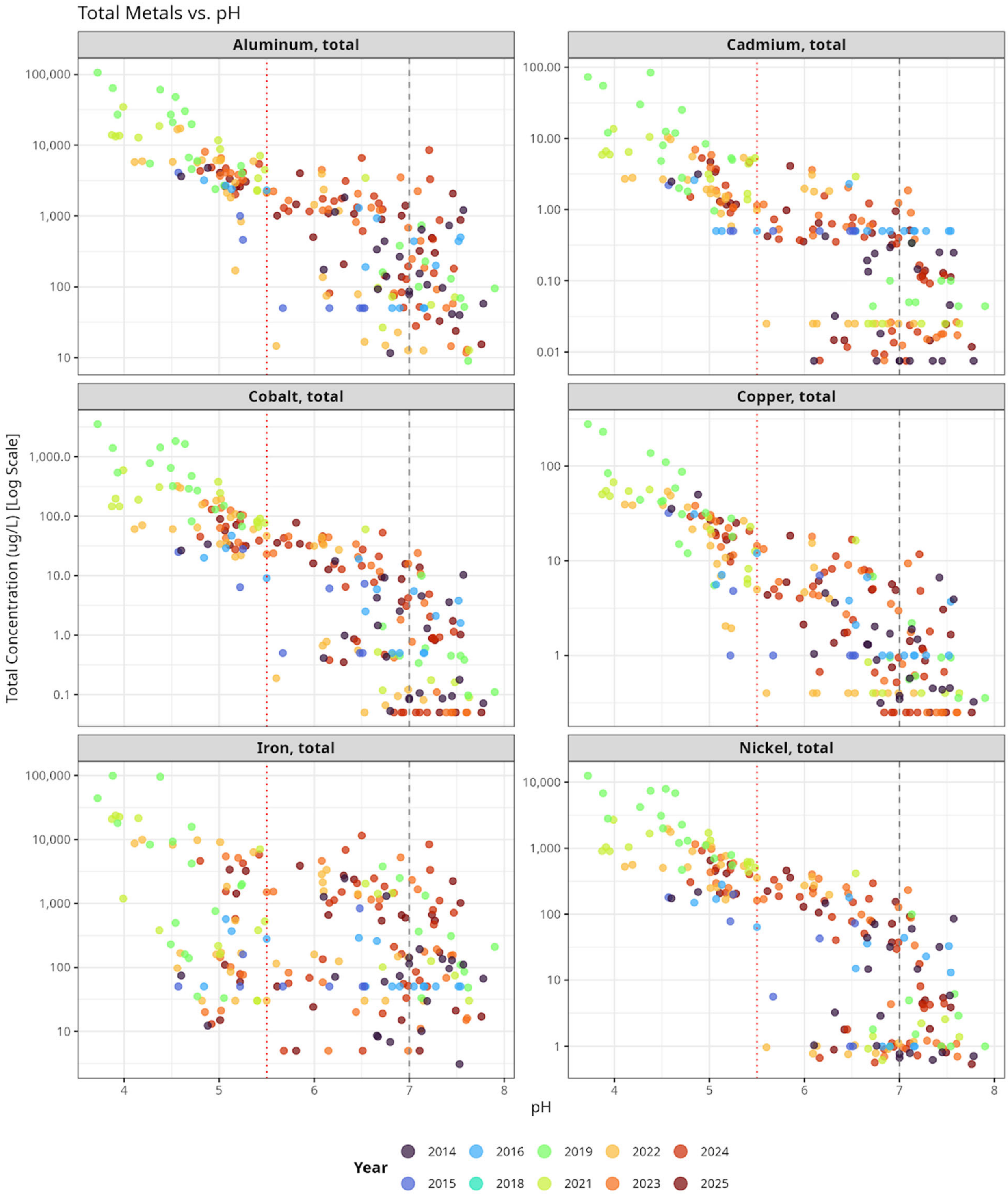

Figure F7. Comparison of total metal values versus field pH by year. Laboratory pH values were used for all 2019 data and in some cases in 2014 when field pH was missing. No pH data is available for 2018.

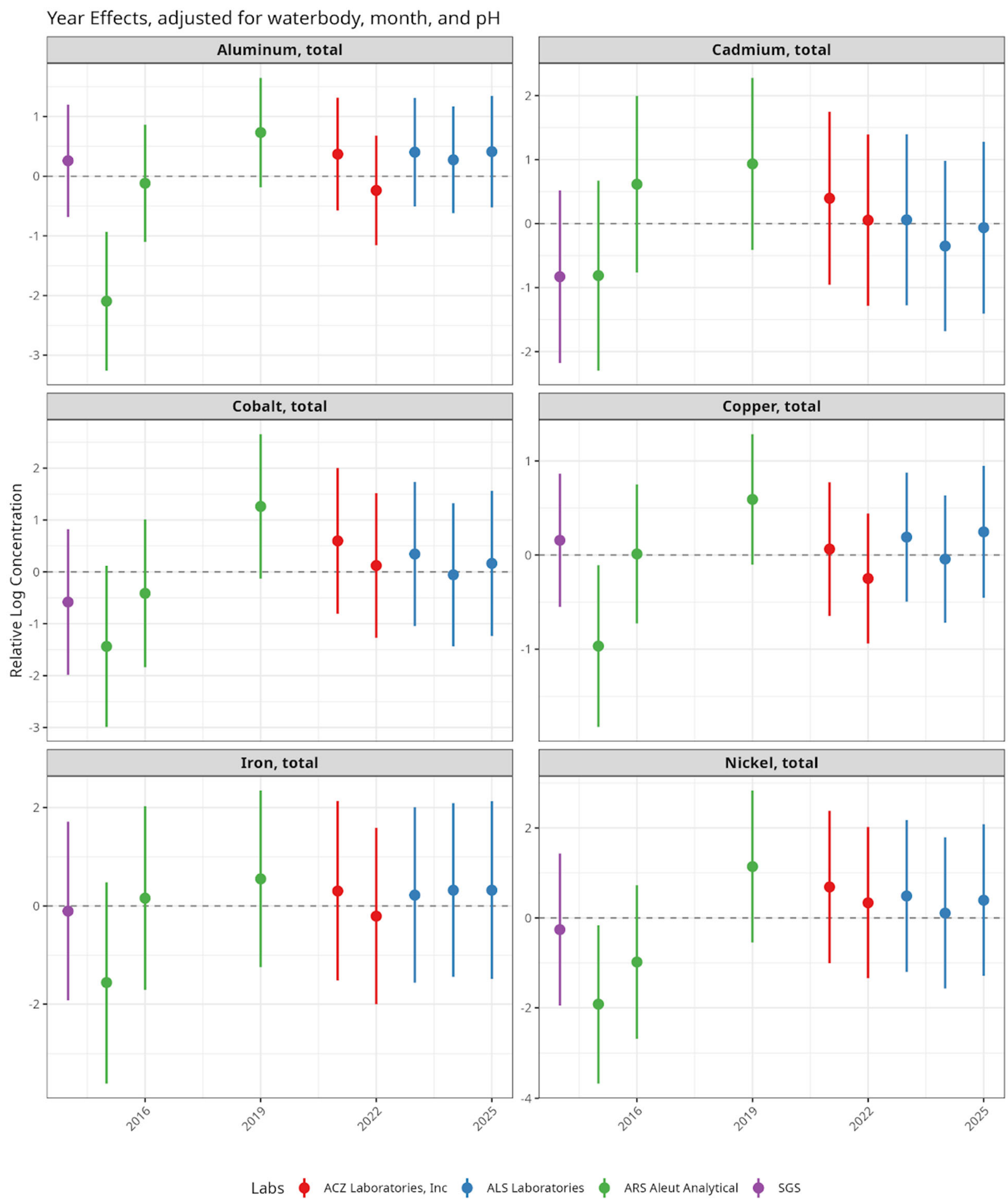

Figure F8. Interannual variability in metal levels after adjusting for waterbody, month, and pH. Different colors indicate different laboratories used. Vertical bars represent the 95% confidence interval of the random effect of year (how that year differs from the overall mean).

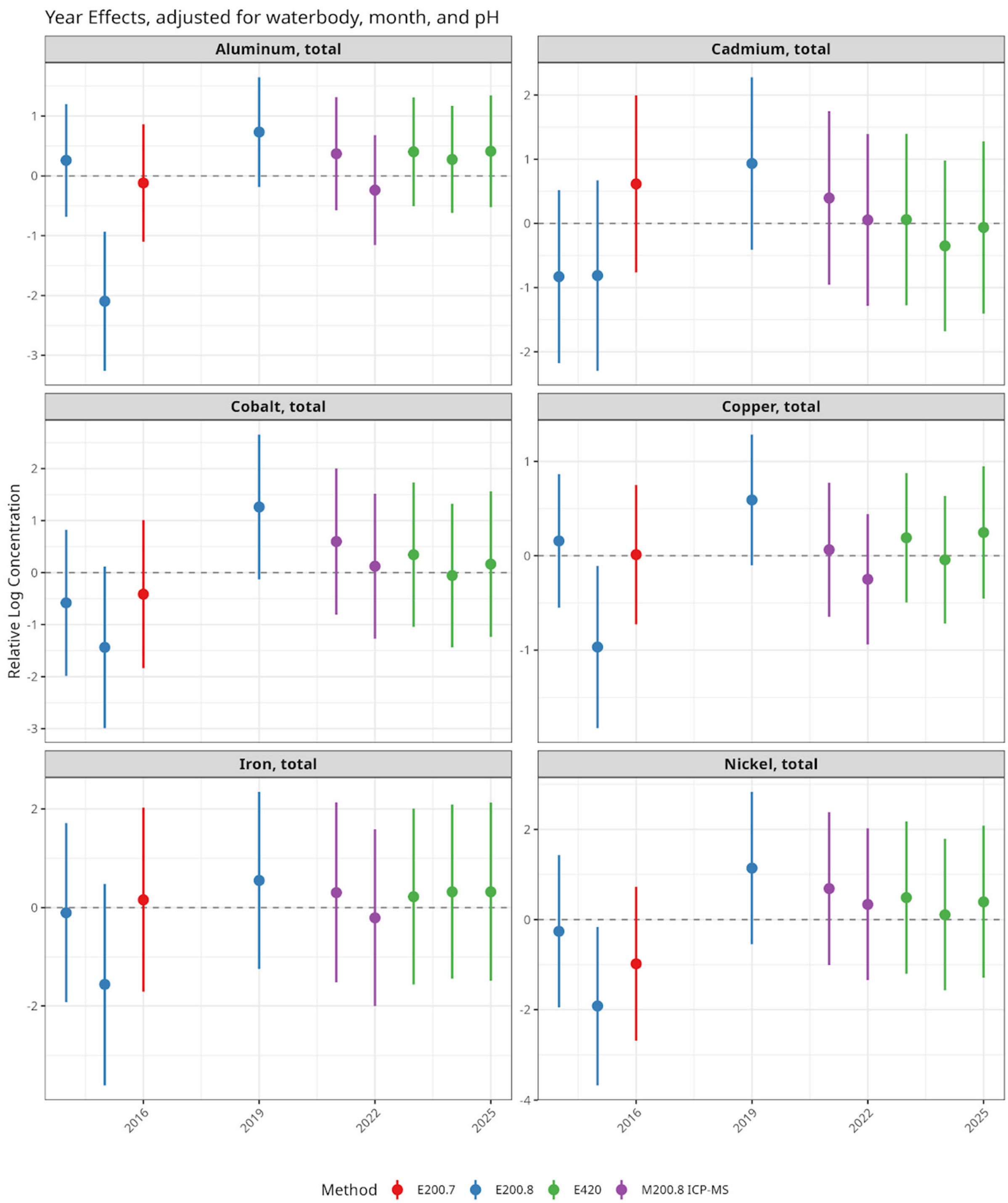

Figure F9. Interannual variability in metal levels after adjusting for waterbody, month, and pH. Different colors indicate different methods used. Vertical bars represent the 95% confidence interval of the random effect of year (how that year differs from the overall mean).

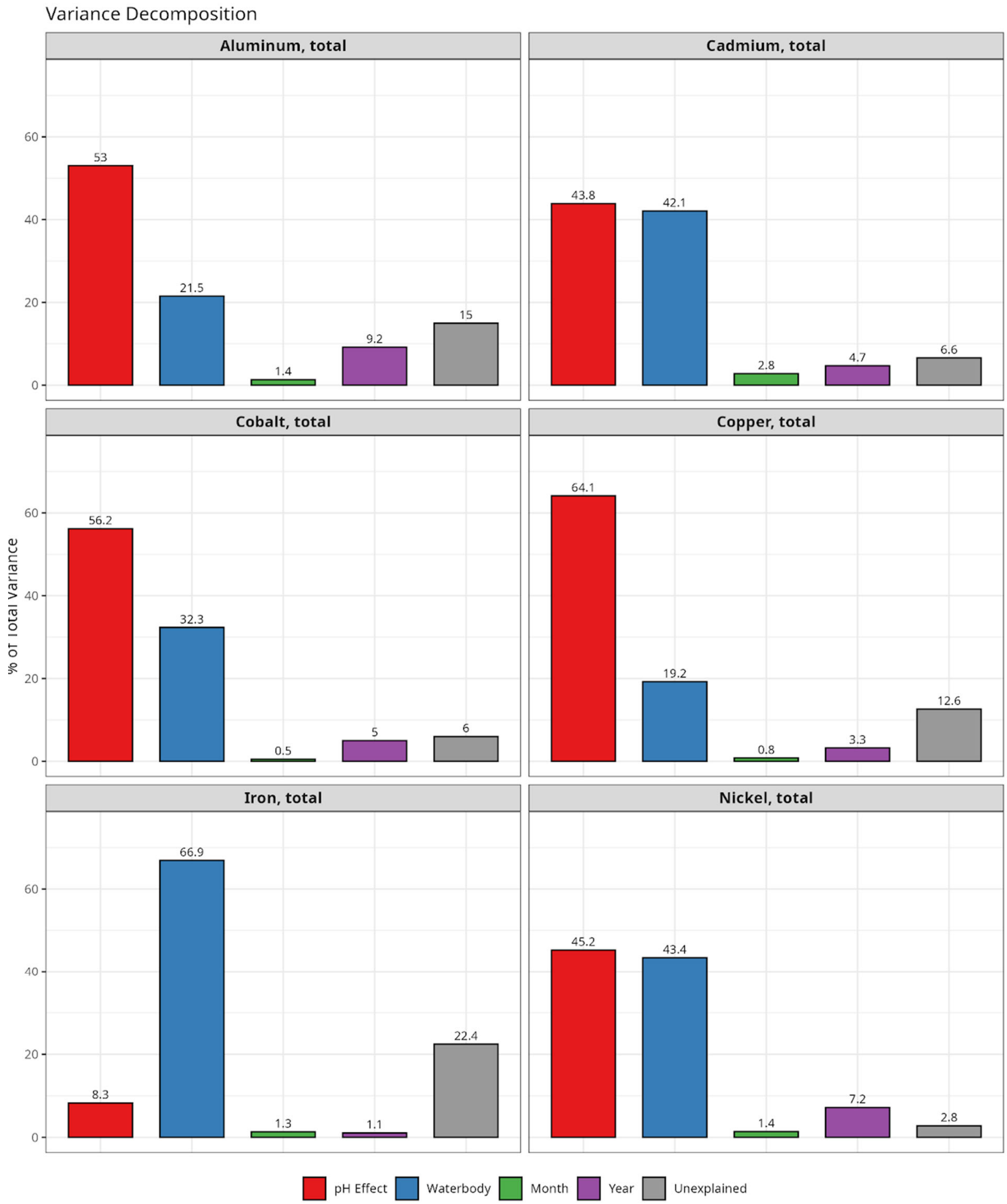

Figure F10. The percentage of variance in total metals values explained by different variables.

Appendix G. QAPP analysis of laboratory QA/QC measures.

INTRODUCTION

As noted in the GCP QAPP for this project (Seigle et al. 2024), there are several QA/QC measures that address process (Quality Assurance) and reliability of results (Quality Control). The QAPP focuses on precision, accuracy, completeness, representativeness, and comparability of results. The following brief analysis is intended to inform the project stakeholders about the reliability of results for water quality tests performed for the GCP.

PRECISION

Precision is the degree of agreement among repeated measurements of the same parameter and provides information about the consistency of methods. Precision is expressed in terms of the relative percent difference (RPD) between two measurements collected at the same location, close together in time. For paired and small data sets, project precision is calculated using the following formula where C1 (primary sample) and C2 (replicate field sample or laboratory duplicate sample) are the two sample measurements being compared: :

$$RPD = \frac{|C_1 - C_2|}{\left(\frac{C_1 + C_2}{2}\right)} X\ 100$$

RPD = Relative Percent Difference
C1 = primary sample
C2 = replicate field sample or laboratory duplicate sample

For this analysis we investigated precision for the last 3 years of water quality data collected by ABR and sent for analysis to ALS (2023–2025). Table G1 shows the relative percent difference between primary and duplicate samples collected in the field for all the analytes sampled by site.

A total of 18 duplicate samples were tested at surface water, groundwater well, and Imuruk Basin sampling sites. Base sample and duplicate samples resulted in a full suite of analyses for 36 samples, resulting in 3456 analyte results (1728 test results each for primary and duplicate samples). We calculated 1728 RPD results for precision analysis between primary and duplicate samples. Of these results, a total of 125 tests (7.2% of tests) resulted in RPD greater than 20% (referred to here as a "hit").

For each duplicate test, 96 analyte results were reported by ALS. A total of 5 of 18 sites had RPD above 20% greater than 10% of the time. Of these, 4 sites were associated with groundwater wells 24GCT022 (14 hits), 23GCT016 (10 hits), 23GC099 (30 hits), and 21GTW007 (12 hits). The surface water site GS1 (Graphite Creek gauge location) also had RPD greater than 20% in more than 01% of samples (11 hits). Analyte RPD's > 20% more than one third of the tests (6 of 18 sites) included total kjeldahl nitrogen, total mercury, and total titanium.

Typically, when field duplicate sample concentrations are greater than 20%, this could indicate either issues with sampling precision, laboratory analytical variability, or environmental heterogeneity. There are a relatively low number of sample tests in which RPD exceed 20%, particularly if we remove well 23GC099 from the analysis. This well is associated with high alkalinity and a very basic pH of 12.

ACCURACY

Accuracy or bias represents the degree to which a measured concentration conforms to the reference value. The results for matrix spikes, laboratory control samples (LCS), field blanks, and method blanks were reviewed to evaluate bias of the data.

The following calculation is used to determine percent recovery for a matrix spike sample:

$$\%R = 100 * \frac{M - U}{C}$$

%R = percent recovery
M = measured concentration in the spiked sample
U = measured concentration in the unspiked sample
C = concentration of the added spike

The following calculation is used to determine percent recovery for a laboratory control sample or reference material:

$$\%R = 100 * \frac{M}{C}$$

%R = percent recovery
M = measured concentration in the reference material
C = established reference concentration

For this analysis we investigated accuracy for the last 3 years of water quality data (primary and field duplicate samples only) collected by ABR and sent for analysis to ALS (2023–2025). Accuracy is calculated and reported by directly by ALS.

Analytical laboratories analyze water samples in “batches” which ALS calls “QC lots.” These batches may include samples from multiple contractors on multiple projects, including a random assortment of samples from different sites at the GCP. It may take several batches to analyze all the samples from a field event at GCP. Each batch also includes multiple QC tests, such as a lab spiked sample with a known quantity of various analytes to be tested. These QC tests are conducted to allow for comparison of analyte results from known spiked values. Laboratory determined error rates in which an inappropriate amount of analyte is detected (either above or below the known concentration) from the spiked sample are assumed to be representative of the non-spiked samples in the batch.

From 2023–2025, there were 17 batches (QC lots) in which the QC of one or more tests that had accuracy-related errors (i.e., the lab did not recover an appropriate percent of their known spiked sample value for a given analyte) (Table G2). For 2023–2025 analytical data, ALS conducted 8,623 total QC tests, with an error rate of 0.20%. These QC tests were conducted within batches that included 22,951 primary field or duplicate results for GCP field sites. The number of results from those tests associated with a laboratory spike accuracy error was 129. Therefore, the total primary and field duplicate results associated with accuracy errors was 0.56%.

A high percentage of errors in recovery of known analytes from laboratory spiked sample tests may indicate issues with laboratory equipment calibration or handling procedures or interference from the sampled matrix. However, the low percent error rate for ALS QC samples suggests that project stakeholders should feel confident about laboratory results. Furthermore, most of the errors are associated with just a few batches and for a limited number of analytes (Table G3). More than 50% (n = 66) of our sample errors (both primary and duplicate field samples) are associated with either total or dissolved thorium, which is generally detected at low concentrations and is not an analyte of concern. Another 34 potential errors are associated with total or dissolved sulfate. An additional 26 potential errors are associated with total iron, total nitrogen, total manganese, and total potassium.

COMPLETENESS

Completeness is the comparison between the amount of usable data collected versus the amount of data deemed necessary to define baseline water quality conditions. Completeness was determined by comparing the intended number of sampling events at intended sampling sites to what was sampled in a given field season. The overall completeness goal is 90 percent for each sampling event.

As an example, in 2023 we intended to sample water quality during three separate events (June, August, and September). Because not all groundwater wells were completed at this time, we intended to sample water at five (August) and eight (September) groundwater wells respectively during the second and third events. We intended to collect water at 10 surface water sites and four Imuruk Basin locations during each of the three sample events. We were successful in sampling all intended sites for a 2023 completeness score of 100%. Overall, we sampled 179 of 184 intended sample sites and our completeness score was 97% from 2023–2025 (Table G4).

REPRESENTATIVENESS

Representativeness is the degree to which data represents a characteristic of an environmental condition. In the field, representativeness was addressed primarily in the sample design by the selection of sites and through sample collection procedures. Many of the sites where water quality sampling has occurred were selected prior to ABR joining the survey team in 2023. However, several factors determined the number and location of water quality sample sites. These factors may include perceived influence from weather, local geology, proximity to the proposed pit, and the number and location of tributaries to major streams. Additionally, annual streamflow and channel morphology likely influenced site selection. In the laboratories, representativeness is ensured by the proper handling and storage of samples and initiation of analysis within holding times. Based on the overall period of survey work (since 2014), the continual addition of sample sites, and the number of sample events per year, we assume that we have good representativeness overall. The only major missing data is likely associated with low flow periods when the project area waters are frozen or flowing under snow and ice.

COMPARABILITY

Comparability is the qualitative similarity of one data set to another (i.e., the extent to which different data sets can be combined for use). From 2023–2025 when ABR was the field sampling contractor, comparability was addressed by use of field and laboratory methods that are based on methods and procedures recommended by EPA (2013) and specified in the GCP QAPP. However, to assess the comparability of data collected by multiple contractors, and sent to multiple different analytical laboratories over more than a decade of sampling, we performed a qualitative and quantitative analysis on water quality data to assess whether all data could be included in this report or if certain years or sampling events should be excluded. Ultimately, we determined that all data should be included in the analysis. See Appendix F for the full assessment.

Table G1. Relative percent difference between duplicate water sample analyte concentrations for water collected by ABR at the Graphite Creek Project near Teller, Alaska, 2023–2025.

Parent Site:	RB1	IM07a_9	GR1	22GC075	GR1	21GC068	IM07a	PT2	24GCT022	GS1	23GCT016	IM07a	PT2	24GCT029	23GC099	GS1	21GTW007	21GTW007	
Date:	6/27/2023	6/30/2023	8/10/2023	8/13/2023	9/21/2023	9/23/2023	6/28/2024	6/28/2024	8/3/2024	7/31/2024	9/6/2024	9/11/2024	7/4/2025	7/8/2025	9/8/2025	9/11/2025	9/12/2025	9/12/2025	Number of RPD >20%
Sample Name:	SW1	SW4	SW1	SW3	SW1	SW3	SW2	SW3	SW3	SW2	SW1	SW3	SW1	SW3	SW2	SW4	SW5	SW6	
Alkalinity, bicarbonate (as CaCO3)	0.0	0.5	0.0	0.0	1.5	0.3	1.3	0.0	0.4	0.0	2.8	0.8	0.0	0.0	0.0	0.0	0.0	1.3	0
Alkalinity, carbonate (as CaCO3)	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.3	0.0	3.0	0.7	0.0	0.0	**50.3**	0.0	0.0	0.0	1
Alkalinity, hydroxide (as CaCO3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**101.6**	0.0	0.0	0.0	1
Alkalinity, total (as CaCO3)	0.0	0.5	0.0	0.0	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.3	0
Aluminum, dissolved	0.3	2.0	1.5	10.8	5.9	3.7	14.4	1.7	14.3	0.6	**22.9**	0.5	0.9	4.6	**89.8**	2.3	**32.3**	**57.1**	4
Aluminum, total	9.6	17.9	2.7	4.5	1.3	2.0	3.1	4.4	**189.4**	19.9	14.0	0.8	2.7	2.3	**101.2**	2.7	11.8	13.9	2
Ammonia, total (as N)	0.0	0.0	0.0	0.7	**93.6**	16.8	0.0	0.0	0.0	**86.4**	0.0	**95.8**	0.0	0.0	16.9	0.0	0.0	**159.2**	4
Antimony, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0
Antimony, total	0.0	**109.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	**66.7**	0.0	0.0	0.0	2
Arsenic, dissolved	**88.9**	2.2	0.0	6.7	0.0	0.0	4.9	0.0	0.0	0.0	17.1	0.0	0.0	**73.4**	**75.0**	0.0	0.0	0.0	3
Arsenic, total	**82.4**	1.5	0.0	5.9	0.0	0.0	3.8	0.0	0.0	0.0	14.3	3.1	0.0	**68.4**	**78.8**	0.0	0.0	0.0	3
Barium, dissolved	6.7	0.6	2.1	6.9	2.4	3.3	10.8	0.8	13.7	0.4	7.0	2.3	4.6	4.5	4.8	2.4	5.0	3.0	0
Barium, total	9.2	3.0	0.0	0.7	1.2	18.1	0.1	1.8	**29.4**	**21.2**	10.8	0.0	1.2	1.2	12.4	5.9	3.1	0.8	2
Beryllium, dissolved	1.2	0.0	17.1	1.8	4.3	0.1	0.0	0.8	0.0	9.7	0.0	0.0	4.7	3.0	0.0	3.7	0.0	0.0	0
Beryllium, total	8.2	0.0	19.1	4.6	7.9	2.6	0.0	4.0	0.0	0.6	2.8	0.0	6.6	2.6	**66.7**	1.7	0.0	0.0	1
Bismuth, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Bismuth, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**73.4**	0.0	0.0	0.0	**66.7**	0.0	0.0	0.0	2
Boron, dissolved	0.0	0.0	0.0	0.0	0.0	4.0	4.6	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0
Boron, total	0.0	0.0	0.0	0.0	0.0	3.3	6.3	0.0	0.0	0.0	9.5	1.8	0.0	0.0	**66.7**	0.0	0.0	0.0	1
Bromide	0.0	7.5	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0
Cadmium, dissolved	2.9	13.5	0.6	6.8	1.6	0.0	4.2	4.2	0.0	1.2	4.7	10.1	1.2	5.3	0.0	0.8	9.4	4.1	0
Cadmium, total	3.7	0.5	1.8	15.0	1.6	0.0	**20.8**	4.7	**86.4**	2.8	12.6	5.0	0.9	0.2	**66.7**	0.8	4.4	4.7	3
Calcium, dissolved	0.8	1.8	2.4	9.9	2.0	0.3	3.2	0.3	0.0	3.1	5.2	2.2	4.8	0.0	0.3	2.7	8.3	1.1	0
Calcium, total	7.5	1.8	0.0	0.5	3.2	1.9	2.0	1.0	1.5	1.2	4.5	0.0	0.5	2.5	2.8	3.0	2.3	4.1	0
Cesium, dissolved	1.1	4.7	11.5	2.0	2.9	6.4	14.0	1.3	0.0	6.0	7.1	0.0	0.6	1.2	3.8	7.1	0.0	0.0	0
Cesium, total	12.2	9.3	0.0	5.7	2.0	7.7	6.1	0.7	**66.7**	**36.9**	0.0	0.0	0.5	0.5	4.6	3.5	0.0	0.0	2
Chloride	**134.6**	0.6	1.1	0.0	1.2	0.0	1.1	2.0	0.0	6.8	**70.8**	3.6	0.9	0.0	0.0	1.0	0.5	0.0	2
Chromium, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	**68.4**	0.0	0.0	16.2	0.0	0.0	1.9	**68.4**	2
Chromium, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**26.6**	**73.4**	6.4	0.0	0.0	3.2	**66.7**	0.0	8.8	**73.4**	4
Cobalt, dissolved	1.5	0.0	1.9	5.4	0.7	1.1	0.0	0.0	0.0	0.8	13.0	0.0	0.3	2.3	0.0	1.6	0.0	0.0	0
Cobalt, total	7.9	11.1	1.8	2.6	0.6	3.3	8.0	0.6	0.0	4.0	10.6	0.0	3.1	2.2	**66.7**	0.3	0.0	0.0	1
Copper, dissolved	1.4	2.5	7.0	0.0	3.5	0.0	4.2	0.8	0.0	8.0	3.9	4.4	1.5	2.9	0.0	0.0	**39.1**	**24.0**	2
Copper, total	7.2	5.1	3.4	0.0	0.3	0.0	4.9	0.0	**160.0**	7.1	6.0	3.3	4.9	2.2	**66.7**	1.1	16.3	**28.0**	3
Cyanide, strong acid dissociable (Total)	0.0	0.0	0.0	0.0	**164.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
Cyanide, weak acid dissociable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Fluoride	5.5	0.0	0.8	3.2	1.9	1.9	0.0	2.5	0.0	4.5	5.9	0.0	0.0	5.3	0.0	1.4	0.0	16.7	0
Hardness (as CaCO3), dissolved	0.3	0.3	1.5	6.3	1.4	0.9	0.4	0.7	2.2	2.8	3.9	2.8	3.6	1.4	1.1	0.5	7.1	0.4	0

Table G1. Continued.

Parent Site:	RB1	IM07a_9	GR1	22GC075	GR1	21GC068	IM07a	PT2	24GCT022	GS1	23GCT016	IM07a	PT2	24GCT029	23GC099	GS1	21GTW007	21GTW007	
Date:	6/27/2023	6/30/2023	8/10/2023	8/13/2023	9/21/2023	9/23/2023	6/28/2024	6/28/2024	8/3/2024	7/31/2024	9/6/2024	9/11/2024	7/4/2025	7/8/2025	9/8/2025	9/11/2025	9/12/2025	9/12/2025	Number of RPD >20%
Sample Name:	SW1	SW4	SW1	SW3	SW1	SW3	SW2	SW3	SW3	SW2	SW1	SW3	SW1	SW3	SW2	SW4	SW5	SW6	
Iron, dissolved	4.5	1.9	0.0	7.2	0.0	1.9	1.5	3.8	0.0	1.6	0.0	0.0	0.0	1.0	0.0	1.3	0.0	0.0	0
Iron, total	**127.3**	2.5	**84.2**	1.2	0.0	0.8	1.0	9.8	**177.5**	**22.1**	6.7	0.9	2.0	2.0	**47.9**	1.8	0.0	0.0	5
Kjeldahl nitrogen, total [TKN]	**92.5**	18.6	0.0	0.0	0.0	0.0	4.9	0.0	**32.8**	**102.0**	**20.9**	0.4	0.0	**81.0**	12.7	0.0	9.6	**97.4**	6
Lead, dissolved	0.0	**21.5**	0.0	0.0	0.0	0.0	**61.1**	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	2
Lead, total	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	**66.7**	**88.0**	13.2	1.6	0.0	0.7	**66.7**	13.3	0.0	0.0	3
Lithium, dissolved	2.6	0.0	0.0	8.6	0.0	3.7	4.9	1.1	0.0	1.5	2.6	1.4	3.2	1.3	0.0	0.7	0.0	0.0	0
Lithium, total	4.4	8.9	4.4	4.3	3.3	3.8	5.3	1.1	0.0	2.9	2.4	2.4	1.1	3.3	0.0	4.1	0.0	0.0	0
Magnesium, dissolved	1.5	0.7	1.0	4.6	1.0	1.5	1.5	1.9	9.4	1.3	1.4	3.4	2.8	3.2	26.6	6.5	2.4	1.6	1
Magnesium, total	6.3	0.7	4.5	2.5	1.9	3.3	5.6	2.4	4.8	0.9	1.9	0.0	2.8	2.9	17.5	1.4	0.8	2.4	0
Manganese, dissolved	1.5	4.3	0.9	0.6	0.7	0.8	12.0	0.7	1.0	0.5	10.5	3.3	0.3	3.7	**94.7**	0.4	12.9	18.9	1
Manganese, total	8.2	2.7	0.0	4.5	1.3	4.8	6.1	1.1	**37.8**	3.8	6.6	1.8	3.0	2.3	14.2	1.3	9.0	6.5	1
Mercury, total	0.0	**87.3**	0.0	**47.6**	0.0	6.9	**128.9**	0.0	0.0	**82.5**	18.7	**44.6**	0.0	0.0	20.3	**94.7**	0.0	0.0	7
Molybdenum, dissolved	0.0	0.5	8.1	0.0	0.5	0.0	3.7	0.9	2.2	5.7	14.3	3.4	2.3	0.0	10.3	0.0	3.3	1.1	0
Molybdenum, total	0.0	1.3	7.0	0.0	6.9	0.0	8.7	3.1	5.2	7.5	11.9	4.5	6.3	0.0	15.2	2.0	6.8	8.3	0
Nickel, dissolved	0.5	2.1	1.6	9.1	0.8	1.2	0.9	0.5	0.0	0.5	12.3	3.8	0.0	3.7	0.0	1.5	0.0	0.0	0
Nickel, total	6.2	5.0	0.2	1.3	0.8	2.1	3.7	0.5	0.0	1.9	**20.4**	1.4	2.7	1.8	**66.7**	1.0	0.0	0.0	2
Nitrate (as N)	1.5	0.0	4.3	0.0	0.8	0.0	0.0	0.3	0.3	1.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0
Nitrite (as N)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Phosphorus, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Phosphorus, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	7.4	0.0	0.0	**66.7**	0.0	0.0	0.0	1
Potassium, dissolved	2.7	1.4	3.5	6.4	0.9	4.0	0.9	1.8	1.4	0.3	6.5	4.2	0.9	6.0	3.7	1.2	5.5	1.0	0
Potassium, total	11.7	0.6	0.0	3.3	1.0	3.2	6.5	2.1	1.4	10.5	5.1	1.7	2.7	3.5	11.0	3.9	0.0	0.5	0
Rubidium, dissolved	0.0	2.2	0.7	16.9	0.6	3.8	6.1	1.1	14.8	1.8	1.2	2.2	0.6	0.2	5.8	1.9	0.0	4.6	0
Rubidium, total	13.1	1.2	3.5	2.5	5.0	3.5	2.0	0.2	**44.8**	17.1	0.7	0.6	2.6	6.3	9.2	0.5	1.4	7.2	1
Selenium, dissolved	9.3	**36.6**	18.0	0.0	8.1	0.0	**51.9**	11.4	3.9	1.9	7.5	**33.8**	0.8	2.6	0.0	6.8	4.8	7.1	3
Selenium, total	10.0	6.8	6.7	0.0	3.2	0.0	**31.8**	**47.8**	**23.9**	5.3	3.9	**43.9**	**21.6**	13.8	18.2	17.3	12.8	9.0	5
Silicon, dissolved	2.2	1.4	0.0	6.7	1.1	2.2	1.8	0.0	0.6	3.8	0.0	2.5	2.3	1.4	11.2	0.8	1.5	1.0	0
Silicon, total	3.9	1.8	0.7	1.2	0.8	2.6	0.8	1.3	6.8	8.3	6.7	1.0	0.4	2.9	6.6	0.4	0.3	3.5	0
Silver, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**73.4**	0.0	0.0	0.0	0.0	1
Silver, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	**66.7**	0.0	0.0	0.0	1
Sodium, dissolved	5.1	1.0	0.4	2.8	2.9	3.0	1.7	2.7	3.5	2.0	6.3	1.0	3.2	4.2	0.0	0.7	0.8	1.8	0
Sodium, total	7.2	1.0	0.9	4.0	0.3	3.6	5.7	1.0	4.5	6.5	2.9	0.9	0.0	1.9	1.6	0.3	1.8	1.2	0
Solids, total dissolved [TDS]	6.2	4.5	3.8	2.8	0.3	3.4	6.4	4.5	2.2	3.3	9.0	2.9	3.7	1.1	2.7	5.6	1.4	3.2	0
Solids, total suspended [TSS]	0.0	**80.0**	0.0	11.3	0.0	8.2	0.0	**66.7**	**82.4**	10.0	11.7	0.0	**66.7**	**46.4**	16.8	8.6	0.0	0.0	5
Strontium, dissolved	3.3	0.0	0.9	5.8	1.1	1.0	0.9	0.5	2.0	3.6	7.6	2.2	2.3	2.9	2.4	0.7	6.1	0.7	0
Strontium, total	6.0	2.6	1.8	1.1	1.6	1.3	1.7	4.7	5.6	0.0	6.6	3.4	0.6	1.6	2.5	0.7	4.4	0.4	0
Sulfate (as SO4)	2.7	0.9	0.8	1.0	0.5	0.6	4.5	0.0	0.0	0.0	3.7	2.7	0.0	0.9	4.2	0.9	0.0	1.8	0

Table G1. Continued.

Parent Site:	RB1	IM07a_9	GR1	22GC075	GR1	21GC068	IM07a	PT2	24GCT022	GS1	23GCT016	IM07a	PT2	24GCT029	23GC099	GS1	21GTW007	21GTW007	
Date:	6/27/2023	6/30/2023	8/10/2023	8/13/2023	9/21/2023	9/23/2023	6/28/2024	6/28/2024	8/3/2024	7/31/2024	9/6/2024	9/11/2024	7/4/2025	7/8/2025	9/8/2025	9/11/2025	9/12/2025	9/12/2025	Number of RPD >20%
Sample Name:	SW1	SW4	SW1	SW3	SW1	SW3	SW2	SW3	SW3	SW2	SW1	SW3	SW1	SW3	SW2	SW4	SW5	SW6	
Sulfur, dissolved	3.3	0.8	4.0	5.5	0.1	2.5	3.4	0.8	3.5	0.3	5.3	1.3	3.5	2.7	8.7	2.8	3.9	3.2	0
Sulfur, total	9.1	3.8	0.9	4.3	1.5	0.6	1.7	1.6	1.2	1.3	2.3	2.0	0.6	3.9	1.2	0.4	1.2	2.7	0
Tellurium, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Tellurium, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**66.7**	0.0	0.0	0.0	1
Thallium, dissolved	5.1	0.0	18.9	0.0	3.4	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	**68.4**	0.0	14.0	0.0	0.0	1
Thallium, total	11.6	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	**44.4**	4.3	0.0	5.7	**66.7**	**66.7**	4.1	0.0	0.0	3
Thorium, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**66.7**	**66.7**	2
Thorium, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	0.0	0.0	0.0	**66.7**	0.0	0.0	0.0	1
Tin, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Tin, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	**66.7**	0.0	**183.9**	**183.9**	3
Titanium, dissolved	0.0	**22.6**	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	**72.3**	6.3	0.0	0.0	0.0	0.0	0.0	0.0	2
Titanium, total	**178.9**	19.1	0.0	0.0	0.0	**183.0**	10.2	**47.3**	**187.1**	**158.7**	9.9	**71.0**	8.1	0.0	**169.5**	**189.0**	**77.6**	**77.6**	10
Tungsten, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.3	0.0	**36.7**	0.0	0.0	0.0	5.1	0.0	0.0	0.0	1
Tungsten, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	**41.7**	0.0	0.0	0.0	2.9	0.0	0.0	0.0	1
Uranium, dissolved	3.7	2.4	2.9	8.0	1.2	2.7	5.4	4.4	4.1	5.3	11.7	0.3	5.3	0.8	9.0	3.4	9.9	4.9	0
Uranium, total	6.5	1.8	3.4	0.3	1.9	0.0	2.8	5.2	1.2	5.0	13.3	0.3	2.3	1.1	5.4	0.7	2.5	2.2	0
Vanadium, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Vanadium, total	0.0	7.5	0.0	0.0	0.0	0.0	1.5	0.0	7.9	**118.7**	4.5	4.0	0.0	0.0	**71.8**	0.0	0.0	0.0	2
Zinc, dissolved	2.5	18.2	2.1	6.4	1.5	1.7	**48.6**	1.0	11.8	0.4	13.7	9.5	1.1	2.6	0.0	2.2	**40.7**	**38.7**	3
Zinc, total	7.1	0.0	0.4	2.1	0.3	1.7	0.0	1.1	9.9	2.1	5.0	0.0	1.7	1.3	**66.7**	0.6	14.5	**42.6**	2
Zirconium, dissolved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Zirconium, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**32.3**	0.0	0.0	0.0	**66.7**	0.0	0.0	0.0	2
Total hits greater than 20% by site>>>	6	6	1	1	2	1	6	3	14	11	10	5	2	7	30	2	6	12	125
Percent of hits by site>>>	6.3	6.3	1.0	1.0	2.1	1.0	6.3	3.1	14.6	11.5	10.4	5.2	2.1	7.3	31.3	2.1	6.3	12.5	1728 7.2

Notes: Values in table represent Relative Percent Difference (RPD), which is calculated as 100*|C1-C2|/((C1+C2)/2).
A "hit" represents any RPD greater than 20% between duplicates.

Table G2. Summary of batches, tests, and error rates in which percent recovery of lab matrix spike did not meet acceptable limits for laboratory QC samples from the Graphite Creek Project near Teller, Alaska, 2023–2025.

Year	Number of QC analyte tests	QC tests that didn't meet laboratory quality objectives	Accuracy error rate (%)	Total number of QC batch associated primary and field duplicate results	Number of affected primary and field duplicate results associated with accuracy errors	Percent of total primary and field duplicate results associated with an accuracy error (%)
2023	2678	2	0.07	7668	10	0.13
2024	4042	5	0.12	9505	44	0.46
2025	1903	10	0.53	5778	75	1.30
	8623	17	0.20	22951	129	0.56

Table G3. Summary of batches, tests, and error rates in which percent recovery of lab matrix spike did not meet acceptable limits for laboratory QC samples from the Graphite Creek Project near Teller, Alaska, 2023–2025.

Year	Analyte	method	qc_lot	Number of field analyte results associated with a QC sample batch that didn't meet data quality objectives
2023	Iron, total	E420	1101325	5
2023	Sulfur, dissolved	E421	1098525	5
2024	Kjeldahl nitrogen, total [TKN]	E318	1602237	8
2024	Manganese, total	E420	1529751	11
2024	Potassium, total	E420	1664087	5
2024	Sulfur, dissolved	E421	1658661	9
2024	Sulfur, total	E420	1529748	11
2025	Sulfur, total	E420	2107927	9
2025	Thorium, dissolved	E421	2099407	15
2025	Thorium, dissolved	E421	2109091	3
2025	Thorium, dissolved	E421	2224972	15
2025	Thorium, dissolved	E421	2226328	4
2025	Thorium, total	E420	2099476	7
2025	Thorium, total	E420	2107927	9
2025	Thorium, total	E420	2224910	12
2025	Thorium, total	E420	2226335	1

Table G4. A summary of possible, intended, and ultimately sampled water quality sites for the Graphite Creek Project near Teller, Alaska, 2023–2025.

Year	Month	Sample Type	Possible samples	Intended samples	Collected samples	% Complete
2023	June	Groundwater	6	0	0	NA
		Surface Water	10	10	10	100
		Imuruk Basin	4	4	4	100
2023	August	Groundwater	6	5	5	100
		Surface Water	10	10	10	100
		Imuruk Basin	4	4	4	100
2023	September	Groundwater	9	8	8	100
		Surface Water	10	10	10	100
		Imuruk Basin	4	4	4	100
2024	June	Groundwater	9	6	6	100
		Surface Water	12	12	12	100
		Imuruk Basin	4	4	4	100
2024	August	Groundwater	14	13	12	92
		Surface Water	12	12	12	100
		Imuruk Basin	4	4	4	100
2024	September	Groundwater	14	10	10	100
		Surface Water	12	12	12	100
		Imuruk Basin	4	4	4	100
2025	July	Groundwater	14	13	10	77
		Surface Water	13	13	13	100
		Imuruk Basin	0	0	0	NA
	September	Groundwater	14	13	12	92
		Surface Water	13	13	13	100
		Imuruk Basin	0	0	0	NA
			Total	184	179	97